THE THIRST DIURESIS, connected "NATURAL" DIURESIS

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G G BORST
M.D
PROFESSOR OF MEDICINE

CHARI DE VRIES
Chem Doctorandus
HEAD OF THE BIOCHEMICAL LABORATORY

the Department of Medicine, University of Amsterdam

normal man the composition and volume of the fluids are almost constant Hence the urinary t of water, sodium, and chloride (the three main nents of the extracellular fluid) and also of ium (the electrolyte of the cells) must be closely d to the intake

FIRST TYPE OF DIURESIS

response to the drinking of water, and the path through which the kidney is stimulated, have been ively studied (Verney 1929, 1946, 1947, Pickford O'Connor 1947, Harris 1948) The chain of events

bsorbed water lowers the concentration of electrolyte n the blood
moreceptors in the region of the internal carotid rtery transmit impulses to the posterior pituitary
ecretion of antidiuretic hormone into the blood is ecreased
he kidney eliminates more water and less sodium, chlo- de, and potassium (temporary "diabetes insipidus")

esponse is prompt the diuresis starts 15 minutes the water is drunk, and usually the whole amount ter is eliminated within 3 hours Drinking, or enous injection, of hypertonic saline, eliciting the hain of events but with opposite effects, interrupts ater diuresis.

a variation in the secretion of antidiuretic hormone ly effective in maintaining the normal electrolyte ntration of the body fluids But since the posterior- ary reaction affects the output of water and electro in opposite directions (Eggleton and Smith 1946, nus and Roberts 1949) regulation of the volume e body-fluids by this mechanism may disturb ormal osmotic pressure Thus in patients with a an increased output of water with a concomitant sed output of electrolytes must raise the concentra f electrolytes in the body-fluids The result will be , and also an increased secretion of antidiuretic one which restricts further excretion of water ver, as soon as the patient has free access to he will drink as much as he has lost by the diuresis retion by the posterior pituitary does not depend on the osmotic pressure of the blood Drinking cohol has the same effect as drinking of water eton and Smith 1946), while acetylcholine (Pickford , morphine and nicotine (Burn et al 1945), pain ell 1949), and emotions promote secretion of ntidiuretic hormone Clinical observations suggest emotions can also provoke a water diuresis

SECOND TYPE OF DIURESIS

e volume of the extracellular fluid is probably lated by a second type of diuresis, characterised by mbined output of water, sodium, and chloride igh it is not yet fully understood, there is abundant ence for, and no evidence against, the following n of events

Absorption of water, plus equivalent amounts of sodium and chloride, increases the average plasma volume and average venous pressure
The average cardiac output rises
The kidneys eliminate more water, sodium, and chloride
There is no important change in potassium output

s work was aided by a grant from the Dutch Foundation for Scientific Investigations

The response is often slow, and also depends on the metabolic needs (muscular exercise, increased basal metabolic rate, fever)

One of us (Borst 1936, 1938a and b, 1941), observed that in patients with massive hæmorrhage from peptic ulcer the excretion of the three components of the extracellular fluid was related to the volume of circulating blood so long as this was too low, the kidney retained water and sodium chloride, even in the presence of œdema and of an extraordinarily high sodium and chloride level in the blood (The high sodium and chloride was due to liberal administration of saline solution, which overcompensated the loss of water through evaporation and "osmotic" diuresis) The patients who had no free access to water suffered from severe thirst As the concentrations of urea, creatinine, potassium, and phosphates in the urine were exceptionally high, the suppression of sodium chloride excretion and the reduction of water output could not be attributed to renal insufficiency Even an injection of a mercury diuretic had hardly any effect The sodium, the chloride, and the water were not excreted until the blood volume was increased, either by blood transfusion, by an infusion of gum acacia, or (in case of spontaneous recovery) by post hæmorrhagic dilution of the blood

Wherever cardiac output is decreased, a similar retention of sodium chloride and water is found In these cases a high level of sodium and chloride in the blood can be produced by rigid restriction of the intake of water It could be demonstrated not only in dehydration but also in nephrotic œdema and œdema due to congestive heart failure Accordingly, we postulated that the output of water, sodium, and chloride depends on the cardiac output, if the heart is normal it depends (according to Starling's law) on venous pressure, and ultimately mainly on the volume of circulating blood (Borst 1938a and c, 1941, Majoor 1942)

We regard this retention of extracellular fluid, whenever the cardiac output is low, as a homeostatic reaction essential for preserving life In the presence of a low serum albumin level it must lead to œdema; in the presence of heart failure it must lead to an increased blood volume and high venous pressure, but even these results, though they have undesirable side-effects, are useful in that they help to prevent the cardiac output from falling too low

The above hypothesis is in keeping with the following facts In nephrotic œdema, gum acacia injections, by increasing plasma volume, produce a strong saline diuresis (Peters 1935, Lepore 1937) The same response can be obtained with any agent that produces a long-lasting increase in blood volume In a patient with Laennec's cirrhosis, Veening (1937) precipitated a saline diuresis by reinjecting her own ascitic fluid intravenously In young men with nephrotic œdema large blood transfusions resulted in a sharp rise in venous pressure, as long as venous pressure remained high, the output of water and chloride was much increased In one case the elimination of extracellular fluid was more than 1 litre in an hour (Borst 1948) In heart failure, saline diuresis is known to be the most reliable sign of a good response to digitalis Paroxysmal tachycardia is sometimes accompanied by diuresis, sometimes by oliguria In this disease we discovered that the diuretic response of the kidneys was a saline diuresis, different from the response of the same patients to the drinking of water. One patient had short attacks, which were accompanied by saline diuresis, and we found that the circulation-time was always slightly but definitely diminished, pointing to an increased cardiac output. When the tachycardia continued, the heart was obviously damaged, the venous pressure rose on slight exertion, and the circulation time became gradually longer This was

associated with a decrease in water and sodium chloride output (Borst 1948, de Vries et al 1950)

We may expect that in normal man, too, the output of extracellular fluid will depend on cardiac output Intake of water with an equivalent amount of sodium and chloride will not change the concentration of the electrolytes in the blood, but the volume of blood-plasma and the venous pressure will rise It is interesting to note that, in physiological as well as in pathological conditions, the diuretic response to an increased cardiac output tends to be much slower than the response to the drinking of water The same is true of the reduction of water and sodium chloride excretion which follows reduction in cardiac output The duration of a change in the circulation is probably as important as its magnitude, when the change is small it must last some time before there is much response from the kidneys The increased output of extracellular fluid following intravenous injection of digitalis glycosides seldom begins within an hour, and may not begin for several hours, though the increase in pulse pressure and the fall in venous pressure are often already at their maximum within three quarters of an hour Likewise in patients who have had hæmorrhages or in patients with nephrotic œdema the diuretic response to a blood-transfusion is often considerably delayed

An unusually long delay is seen in patients who develop urticaria after transfusion This may be explained by a temporary decrease in the total volume of circulating blood after the transfusion, because the volume of plasma lost into the weals exceeds the volume of the transfused blood This is demonstrated in fig 1, presenting the data for a patient who was treated for severe anæmia and slight hypalbuminæmic œdema She lost no blood during the period of observation, and received only milk at regular intervals, and accordingly the excretion of water and chlorides followed the diurnal rhythm we shall later describe During the transfusion severe urticaria developed lasting several hours The hæmoglobin rose steeply to a level higher than was anticipated, and the venous pressure exhibited a slight decline When the weals disappeared the hæmoglobin level gradually decreased from 11 1 to 8 9 g per 100 ml, showing that the increase in blood volume must have been 25% in 24 hours Parallel with the blood dilution the output of water and sodium chloride increased

A delay in diuretic response of more than 12 hours, not due to plasma loss, was seen by one of us (Borst 1936) in a case in which a large transfusion was followed by a febrile reaction, and similar observations have since been made many times When in administering digoxin or strophanthin some fluid is injected parenously, the diuretic response often remains in abeyance so long as the local inflammation is accompanied by fever The sodium retention found during infectious diseases is probably of the same type

In two patients with lobar pneumonia and in three patients with peritonitis (Borst 1948) we found a total suppression of sodium chloride output and a high sodium and chloride level in the blood The pulse pressure and the pulse rate were high, in one case the urea clearance rose to 150% of the normal average, in another case it rose to 250% The cardiac output and the renal blood flow must have been high, there was no anæmia and no aortic incompetence Large transfusions, combined with intravenous injection of 5% glucose, elicited a marked but brief saline diuresis Obviously a rise in cardiac output resulting from fever, or from change in metabolism related to fever, does not give rise to a saline diuresis, usually sodium chloride and water are retained The reduction in urinary output is not related to increased extrarenal fluid loss, for it starts before a significant amount of fluid can have been lost by ev[illegible] g and it [illegible] found in patients wi[illegible] water and s[illegible] chloride balance du[illegible]

The forcible hear[illegible] induced by strenuous mu[illegible] exercise is also fo[illegible]ed by oliguria and salt ret[illegible] (Eggleton 1943). On the other hand, a change from [illegible] standing to the recumbent position, resulting in 33% rise of cardiac output (McMichael and Sharpe Schafer 1944a) without an increase in metabo[illegible] often causes a saline diuresis (Ni and Rehberg 1931).

Merrill and Cargill (1947) found that in latent heart failure the elimination of sodium chloride was not impaired during rest, but fell sharply during slight exercise In hyperthyroidism complicated by heart failure, sodium chloride excretion might be low in the presence of a cardiac output higher than normal. decrease in metabolic rate was accompanied by a elimination of chlorides

Warren and Stead (1944) noted that in patients with heart failure sometimes a considerable retention of water, sodium, and chloride, associated with marked blood dilution, preceded the rise in venous pressure They concluded that this retention was primarily renal and was related to a reduction in cardiac output The observations are still open to debate, because exact recording of venous pressure by the method of Mont and Tabora is difficult, but their conclusion is generally accepted

THIRD TYPE OF DIURESIS

Water diuresis and saline diuresis, with their physiological counterparts, do not explain all the variations in the output of urine Of great significance also is

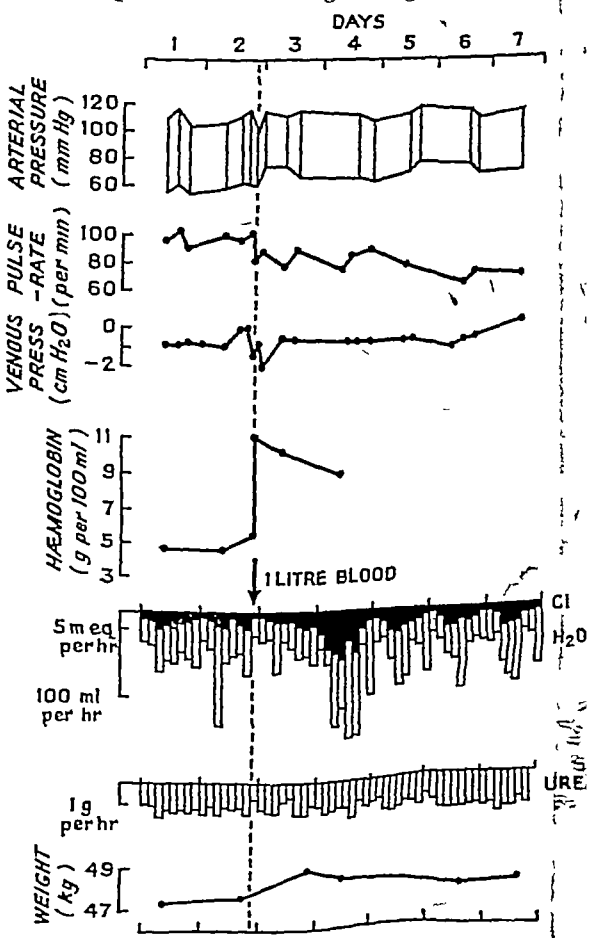

Fig 1—Blood transfusion followed by urticaria. Plasma loss caused temporary excessive rise in hæmoglobin and delayed the diuretic response

ird type of diuresis, connected with the diurnal hythm

Quincke (1877) pointed out that urinary output is ppreciably higher by day than by night, and that it rises promptly in the morning if the subjects stay awake after having passed urine In 1893 he reported that patients with heart or kidney diseases often have the peak of diuresis during the night Wilson (1889) had noticed that whereas in most patients the diurnal rate of excretion of water and solids is far higher than the nocturnal, in cases of debility the two rates of excretion approximate, especially in cardiac disease and even more in organic renal disease

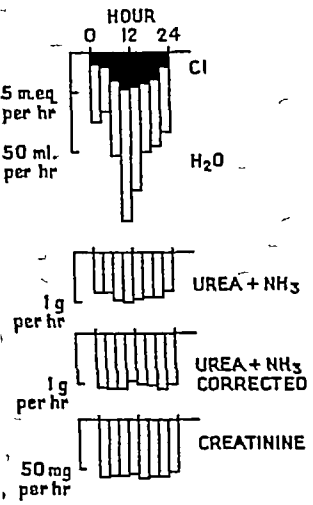

Fig 2—Diurnal urinary output of water and chloride and of urea and ammonia (average of 65 days, Jan. 16 to March 21) also diurnal urinary output of creatinine (average of 42 days)

Campbell and Webster (1921,-1922) found that the excretion of chlorides and urea was also highest during the day, but creatinine excretion remained more or less at the same level When the subjects slept in the daytime, working and taking food and fluid at night, the rhythm was not reversed. Jores (1933), repeating the experiments with people accustomed to night work, confirmed these results

Simpson (1924, 1926), Norn (1929), Gerritzen (1940), and Smits (1947) studied subjects lying in bed and receiving exactly the same food and water at regular intervals during the day and during the night The urinary output per hour of chlorides (and, in the cases where it was determined, of sodium and potassium) showed a regular tide, the lowest output being found between 9 P M and 4 A M and the highest between 7 A.M and 4 P.M. The lowest figures were one third of the highest The diurnal variation in the output of water, though following the same course, was not as regular as the diurnal variation in the output of the electrolytes According to Norn, the differences between day and night are greatest for the output of potassium, but there were no fluctuations in serum potassium Magnesium output had its peak during the night, and calcium output was independent of diurnal rhythm

Gerritzen, who found appreciable fluctuations in the output of urea and only slight variations in blood-urea, expressed the view that urea production by the liver and urea excretion are coördinated

Simpson showed that in some of his subjects sleep decreased the output of water and chlorides during the day, in the majority the diurnal rhythm was not influenced by sleep in the daytime

Smits found a reversed rhythm in two patients with heart failure and in four out of six patients with cirrhosis of the liver, they had the highest output of water and chlorides during the night In one case, in which sodium and potassium were determined, sodium excretion varied like that of chlorides, but potassium excretion was the same by day and by night

PRESENT INVESTIGATION

In the present study we examined, during a total of 500 days, the urine of fourteen male and four female patients, who emptied the bladder 8 times a day, exactly at midnight, 3 A M, 6 A M, &c Great care was taken to avoid loss of urine during bowel movements After having passed urine, the patients drank an exactly measured amount of milk and water and ate one or two biscuits with butter The three-hour rations remained the same throughout the experiment

In one patient, suffering from attacks of paroxysmal tachycardia, but having otherwise a normal circulation, we collected 65 × 8 urine samples All were measured and examined for chlorides, and for urea plus ammonia, creatinine was determined only for 42 days Average figures for the output in successive three hour periods are presented in fig 2

One patient, suffering from peptic ulcer of the lesser curvature (described in detail by Molhuysen et al. 1950) received, during part of the observation period, a supplement of 5 g sodium chloride and 8 4 g bicarbonate divided into 8 equal parts daily The urine became alkaline and contained virtually no ammonia In this case we determined also the sodium and potassium (flame photometer) Since the patient received during part of the observation period a treatment that would disturb the rhythmic output, the average figures presented are taken only from days for which this interference need not be considered

Figs 2 and 3, which are representative for several other cases, show clearly that under the described conditions water and potassium output are at midnight nearly 50% of the amount excreted at midday During the night the output of chloride and sodium falls to approximately 33% of the highest daytime amount †

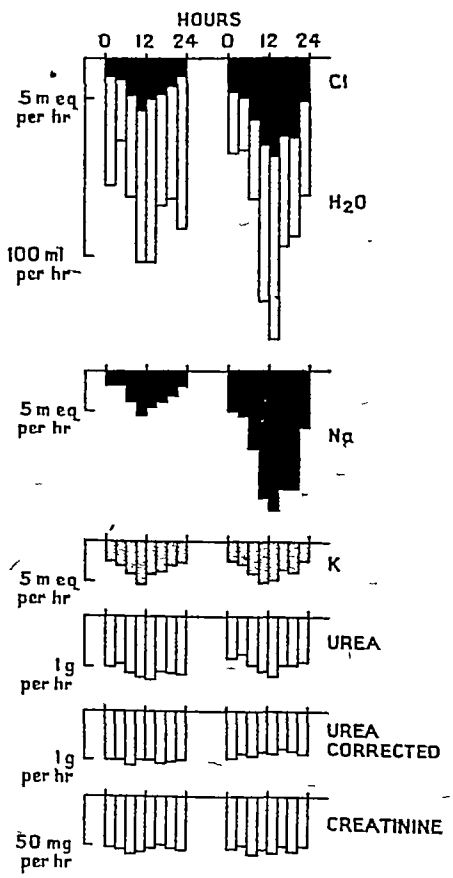

Fig 3—Diurnal urinary output (averages of two 10-day periods in December and January) The chart on the right shows the average figures for the days when a supplement of 5 0 g sodium chloride and 8·4 g sodium bicarbonate was given and the urine was free from ammonia.

Since the difference between the elimination of urea by day and by night depends on the flow of urine in the tubules of the kidney, a higher output during the day was to be expected On calculating the supposed output at an excretion rate of 1 ml per minute, according to van Slyke's formula for the standard clearance, the averages for the corrected figures show only insignificant

† When the intake of electrolytes is excessive the percentage difference during day and night is less impressive

fluctuations When bicarbonate is used and no ammonia is excreted, there is a slight fall in urea output during the first part of the night, following the period of higher diuresis In patients not receiving bicarbonate, an increase in the ammonia excretion during sleep probably just compensates for this small reduction in urea output The output of creatinine remains constant, not only in the average figures but even in the individual ones fluctuations beyond 20% of the mean are exceptional, and bear no relation to diurnal rhythm (Molhuysen et al 1950)

The diuresis related to diurnal rhythm is characterised by a simultaneous rise in the output of water, sodium, chloride, and potassium—i e, both intracellular and extracellular fluid—and cannot be mediated either by the pituitary or by increased cardiac output It represents a fundamentally different type of diuresis

DIURNAL RHYTHMS

The rhythmic excretion of urine is only one of the diurnal variations of the organism Rhythmic variations in body temperature have long been recognised, and a diurnal rhythm of carbohydrate metabolism, reflected in a high blood glucose level in diabetics during the night, is shown to exist independently of food intake and sleep (Forsgren 1929, 1934, Ekman and Holmgren 1949, Gerritzen 1940, Möllerstrom 1943) Probably there are also diurnal rhythmic fluctuations in the blood eosinophils, the highest figures being found at night (Rud 1947)

It is tempting to attribute all these rhythmic changes to a rhythmic secretion of adrenocortical hormones of the 17-hydroxy corticosterone type Though, in the treatment of rheumatoid arthritis, Compound E promotes retention of extracellular fluid and excretion of potassium, just as deoxycortone does (Perera et al 1949, Sprague et al 1950) in short lasting experiments, in certain circumstances Compound E enhances the output of sodium chloride and potassium (Thorn et al 1941, Ingle et al 1945, Dorfman 1949), it raises the blood-sugar level, and reduces the number of eosinophils, it increases uric acid excretion, while creatinine excretion is unchanged (Forsham et al. 1948)

A patient with typical Addison's disease, receiving the standardised diet and deoxycortone injections (2 mg at midnight, at 6 A M, at noon, and at 6 P.M) still showed the rhythmic excretion of water and electrolytes, but the variations were far less conspicuous than in other patients who followed the standardised diet (fig 4) For comparison we present the figures of a normal man lying in the same wards during the same period, and receiving the same diet, with the addition of 8 biscuits, 2 g of sodium chloride, and 400 g of water daily Probably the patient with Addison's disease had still some functioning adrenocortical tissue, for the decline in plasma volume following withdrawal of deoxycortone was self limiting and no crisis developed (see Molhuysen et al 1950), but the reaction to adrenocorticotropic hormone was absent The diurnal rhythm is caused by alternation of day and night The relative importance of daylight and of the change from sleep to waking cannot easily be determined, and the delay between stimulus and response is not known Some of our observations suggest that the increase in the output of water and electrolytes after waking and becoming exposed to daylight may be prompt and of the same magnitude as the responses in the other types of diuresis It is difficult to reverse a rhythm completely by a reversal of routine (Jores 1933), probably the diurnal rhythm, like any other rhythmic phenomenon, tends to outlive its cause However on a boat going from east to west the peak of excretion is every day one hour earlier, remaining at the same hour on local time (Joslings 1940)

At a meeting of the Netherlands Society for Gen Pathology on April 1, 1950, Gerritzen presented of three subjects who were exposed to artificial dayl during the night and were in the dark during the This régime resulted in duplication of the rhythm in excretion of water and chlorides, the two maxima be at noon and at midnight In a fourth subject, looked directly into the lamp during the night, rhythm was completely inverted by three dark and three light nights

The data presented in figs 2 and 3 were obtained winter In winter as well as in summer the light our wards is reduced, and no conversation is allow from 8 P M till 6 A M, at which time the nurses st work and all the patients are awake Accordingly fr 9 P M until 6 A M the urinary output is low Only patient, a young woman, was studied at the height summer, and in this case the output of chlorides in period between 3 A M and 6 A M, and especially betw 6 A M and 9 A M was much higher than during wint whereas from 9 P M to 3 A M it was regularly as low one third of the output during the peak of diure (fig 5) This result may be explained by the fact th the window curtains do not prevent daylight fr entering the wards in the early morning The variatio in potassium elimination in this case are also strikin the difference between day and night output is far grea than usual, the ratio being 4 to 1, or nearly same as found by Norn (1929) in experimen on himse Unfortu ately No does n mention t time of t year W found th the patte of chlori excretio of the patien studied March an April, and one studi in Septe ber, wa between t summer a winter ty (fig 4 righ hand side)

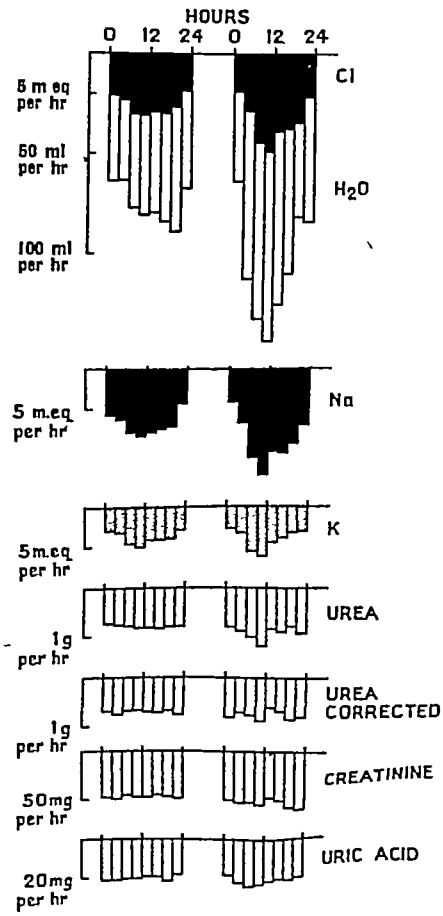

Fig 4—Diurnal urinary output (averages of the 7 days March 18-25) Right: normal subject. Left patient with Addison's disease The normal subject's diet differed by the addition of 8 biscuits and 2 0 g sodium chloride Owing to the use of sodium bicarbonate the urine contained only traces of ammonia.

CHARTS —AND DEDUCTION FROM THE

By recor ing the da in schemat form, near every di resis n produce by diuret drugs can b attributed t one of th three type or to combina tion Fo

however, the hourly intake and output of food, fluid, and electrolytes must be known, as well as the temperature, body-weight, venous pressure, arterial pressure, heart rate, and blood hæmoglobin, which sometimes must be estimated several times a day Also the daily recording of all the information on charts must be constantly under the eyes of the workers interested in the case, and especially of the nurses, to enable them to see at a glance the relation in magnitude and time of all the findings Inevitable mistakes are then traced without delay and often can be redressed, or, when this is impossible, at least repetition on subsequent days is avoided Furthermore we have found that the facts are far better understood when the findings for a recent period are presented We have therefore simplified the methods as far as possible and have avoided complicated procedures, believing that rapid information on a great many points is often more useful than more detailed information on one point obtained by tricky and time consuming methods Our methods are described elsewhere (Borst 1948, Molhuysen et al 1950)

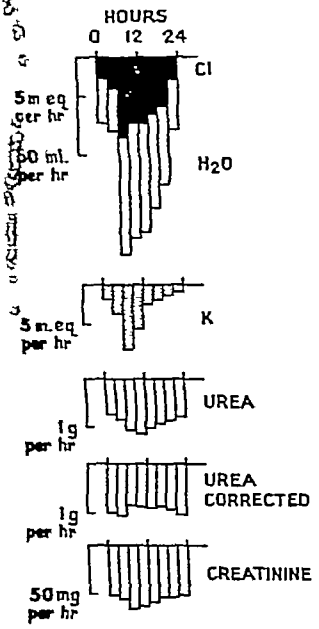

Fig 5—Diurnal urinary output of water and chloride (average of 7 days) potassium (2 days), and urea plus creatinine (4 days) in June.

Problems supposed to be very complex often turn out to be simple when an overwhelming number of data can be collated graphically on one chart Van Slyke, Smith, Albright, and their co workers, and other investigators, have long used these methods with striking results Unfortunately every problem needs its own type of recording, and to those unfamiliar with the key, the large charts, with so many blocks and curves, may seem at first to increase the difficulties

As we usually want to compare the data of a large number of cases, even the amount of wall space available for charts may decide whether an important problem is rapidly solved or not In our hospital the wards which are out of use because of the lack of nurses have proved highly convenient for displaying our figures

The reversed rhythm found in some patients with heart-failure and cirrhosis of the liver could be explained when their charts were compared with those of patients showing a normal rhythm In cases of gastric ulcer, water and chloride excretion sometimes decreased when the patients who had been recumbent for some time were propped up on cushions Viersma and ten Holt (1950) studied a patient with postural hypotension who was having the standardised diet Raising the head of the bed by 40 cm resulted in a sharp fall in blood pressure, accompanied by a long-continued reduction in water and sodium chloride excretion to 30%, the reduction in the output of potassium was slight and did not disturb the pattern of rhythmic excretion

In heart failure and in cirrhosis, where there is increased pressure in the portal vein, the venous return is abnormally dependent on the position of the patient One of our patients with Laennec's cirrhosis showed a normal rhythm as long as we insisted on complete recumbency Thereafter he arranged his pillows in such a way that he was semirecumbent during great

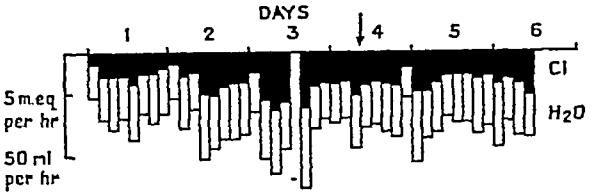

Fig 6—Effect of position in bed on the output of water and chloride in a case of cirrhosis of the liver Continuous complete recumbency ended at the point marked by the arrow

parts of the day and was continuously recumbent only at night From that moment (marked in fig 6 with an arrow) the output of water and chloride was irregular, the highest output being found during the night (fig 6) The same change could be demonstrated in a patient with heart failure of moderate severity Probably the contrast in excretion of extracellular fluid and potassium, found by Smits in the case described above, was also due to the semirecumbent position during the day

In severe heart failure we found the elimination of extracellular fluid often lower in recumbency than in the upright position This must be due to a decrease of the output of the overburdened heart, as could be expected from Starling's law and as has been shown by McMichael and Sharpey Schafer (1944b)

In the patient with paroxysmal tachycardia the rhythm was interrupted by an enormous excretion of water, and (to a lesser extent) of sodium and chloride, at the beginning of an attack When the tachycardia continued for several hours the regular rhythmic output was resumed During an attack lasting several days and treated with quinidine in high dosage, heart failure developed, the elimination of water and chloride was depressed but strictly rhythmic, the lowest excretion being found during the night The patient was lying quietly recumbent all the time.

A patient with the nephrotic type of glomerulo nephritis, having massive œdema and ascites and a urea-clearance of 17%, was in nearly the same semi-recumbent position during day and night The output of chlorides was low, but showed a regular and normal rhythm, with the maximum during the day Large blood-transfusions, resulting in a rise of the abnormally low venous pressure, increased the output of both water and chloride, but the diurnal rhythm was undisturbed and continued on a higher level.

THE KIDNEY AND DIURESIS

The mechanism of the renal response in the three types of diuresis is only partly known

It has been demonstrated that water diuresis does not depend on the glomerular filtration-rate and is due to depression of reabsorption by the tubules.

In the diurnal excretory rhythm the figures for urea and creatinine suggest a relatively constant glomerular filtration-rate, while the fluctuations in the output of water, sodium, and chlorides (the components of the extracellular fluid) and of potassium are due to variations in tubular reabsorption

Only in the second type of diuresis is the evidence for a purely tubular mechanism inconclusive Merrill (1946) and Mokotoff et al. (1948) demonstrated that low cardiac output in heart-disease was associated with a reduced renal blood flow and glomerular filtration-rate Merrill and Cargill (1947) also found that the retention of sodium chloride in their patients with heart-failure was always associated with a reduction of the glomerular filtration-rate by more than 30% From analogy with what is known about the reabsorption of glucose, they assumed that the reabsorption of sodium chloride continued at the normal rate, with the result that there was a sharp reduction in its excretion

As the level of endogenous creatinine in the blood is (over not too long periods) constant (Blumgart et al. 1934), creatinine output in successive urine specimens can, as a relative measure for creatinine clearance, be compared to chloride excretion in the same urine specimens (Catheter specimens from the bladder are unnecessary) Furthermore, when fluctuations of blood urea are minimised by a standardised intake, as can be checked by one or two blood-urea determinations daily, analysis of the urine specimens is sufficient to show any gross variation in urea clearance over the day A great many observations in patients and normal subjects have demonstrated that creatinine output and urea-clearance are closely related.

Nearly always a sharp decrease in urea-clearance and creatinine output, resulting from circulatory disturbance, is accompanied by a much more pronounced decrease in the output of chlorides and sodium , but the two decreases do not run parallel. Chloride excretion may remain low or may be decreased in spite of a rise in creatinine output and urea-clearance Total suppression of sodium chloride excretion often continues for some time after recovery from a long lasting serious impairment of the circulation when urea clearance has already risen to normal values (Borst 1936, 1938a) During fever, all sodium and chloride may be retained, in spite of an excessive urea clearance (to 250% of normal) and in the presence of high sodium and chloride levels in the blood In heart-failure or in nephrotic œdema an improvement in the circulation often produces a lengthy saline diuresis, while a rise in urea-clearance and creatinine excretion is absent or lasts only a short time (Borst 1948)

On the basis of these facts we think that in patients with a low cardiac output there are two mechanisms, wholly different in character but finally leading to the same result (1) hyperfunction of the renal tubules causes a selective retention of extracellular fluid, and (2) reduction of the glomerular filtration rate reduces the excretion of all urine constituents, including water and sodium chloride The second mechanism is probably the less important

SUMMARY AND CONCLUSIONS

Three fundamentally different types of diuresis and their physiological counterparts can be distinguished -

1 Diuresis of water
2 Diuresis of water plus sodium chloride (extracellular fluid)
3 Diuresis of water plus sodium chloride plus potassium (extracellular plus intracellular fluid)

Respectively these are the response to the drinking of water, to an increased cardiac output, and to the change from night to day as part of the diurnal rhythm

The elimination of water, sodium, chloride, potassium, urea, and creatinine has been studied in eighteen patients receiving, over a total of 500 days, 8 equal amounts of milk daily, given at 3 hourly intervals During winter the output of water and the three electrolytes was highest from 9 A M to 3 P M and lowest from 9 P M to 6 A M The ratio for sodium was 3 to 1 , for water and potassium it was 2 to 1 In summer (one case) the peak for water and electrolytes was from 6 A M to 9 A M , and the lowest excretion was from 9 P M to 3 A M In spring and autumn the pattern of excretion was between the two extremes.

The average excretion of creatinine and urea (corrected for diuresis) is independent of the diurnal rhythm and shows no important fluctuations This points to a more or less constant glomerular filtration rate during the 24 hours of the day, the variations of diurnal excretory rhythm being dependent on variations in tubular reabsorption The available evidence, though inconclusive, points to the same mechanism for the saline diuresis, the glomerular filtration being at of minor importance

In a patient with Addison's disease a normal exc rhythm was found , but the ratio between the o during day and night was only 3 to 2

The diurnal rhythm may be reversed in cirrho the liver and in moderate heart-failure when the pa are recumbent at night and semirecumbent durin day, so that venous return is reduced The re is especially in excretion of water and sodium c

Invaluable assistance in this work was given by the and the laboratory staff The ward nurses A van and W L E Sipkes were responsible for the supervis the diets, the collection of excreta, and the weigh patients Miss E Knol made the calculations and p the figures , Miss J van Daatselaar made the flame meter determinations , and the other determinations largely done by Miss L Quelle, Miss E Mollema, M Buitenhuis, Miss F Wellinghof, and Miss D Doyer

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THE EFFECT OF SPLANCHNICECTOMY ON RENAL FUNCTION

A IAN L MAITLAND
V R D, M B Glasg F R F.P S, F R C S E
ASSISTANT SURGEON, WESTERN INFIRMARY, GLASGOW

THE manner in which thoracolumbar sympathectomy achieves its beneficial effect in hypertension is not fully known Corcoran and Page (1941) have shown that the renal blood flow is unaltered by the operation Consequently there is a tendency to regard the effect as due to the capacity of the denervated blood vessels to dilate and so absorb the excess pressure An alternative or parallel view is that the effect is obtained partly by this dilatation and partly by breaking the chain between the hypophysis and the kidney through the only link accessible to surgery An important result of the work of Corcoran and Page has been to direct attention away from changed conditions in the kidney

Trueta et al (1947) have shown that the shunt mechanism which they describe in the kidney may considerably alter the distribution of the blood flow through that organ without materially changing the total volume apparently traversing its vessels They have also shown that this mechanism is under the control, and may be brought into action in animal experiment by stimulation of the nerve supply to the kidney When it is recalled that Peet's procedure represents the minimum, Smithwick's the optimum, and Grimson's the practical maximum ablation of the sympathetic ganglia necessary to ensure a preganglionic denervation of the kidneys, it seems possible that part of the benefit from these operations may be due to some redistribution of the blood flow within the kidney As any effect of this kind would be demonstrable by an alteration in the composition of the urine obtained before and after the operation, I have investigated a small series of hypertensive patients before and after the first stage of a bilateral splanchnicectomy, and 5 of these have now been followed for over a year

METHOD

The initial investigation into separate renal function consisted in intravenous pyelography and renal analysis, the latter only was repeated, usually three weeks after the first splanchnicectomy The method of differential renal analysis favoured has already been described (Maitland 1949) The patient receives no fluid for five hours before the examination and is limited in intake from the evening before The specimens are obtained from the bladder at cystoscopy and from each kidney through ureteric catheters The renal specimens are collected for a suitable period in graduated tubes At the end of this time the wastage to the bladder is collected as the catheters are withdrawn and their tips lie on the trigone This wastage is measured separately, but if 6 F whistle tipped ureteric catheters are used it rarely exceeds 1 ml Experience gained from carrying out this form of investigation in 150 patients with various renal lesions has shown that, for studies such as this, the volume of urine collected from each kidney, the pH, and the urea content provide adequate data for comparison Before this conclusion was reached, creatinine estimations were also made, but they were discontinued when no significant difference in the behaviour of the two substances had been found in 15 cases The pH is estimated by the B D H 'Capillometer,' and the urea in a 'Doremus' ureometer by the hypobromite method using a tuberculin syringe and a curved needle to deliver the urine to the ureometer

The results obtained from these admittedly primitive clinical methods of investigation into renal function in 7 cases are detailed in tables I and II

The actual figures obtained are presented in table I In table II the standard urea clearance values calculated from the figures in table I are related to the blood pressure at the time and in 5 cases which have been followed for periods between a year and eighteen months have also been correlated with the late result of the treatment

CASE RECORDS

Each case is discussed individually before any attempt is made to group the results in any way

Case 1 —Male aged 52 Seen on May 19, 1948 For a year had had headaches of increasing severity with two severe hypertensive crises, six and four months ago Recently the headaches had been very severe accompanied by vomiting and quite uncontrolled by sedatives There had also been dizzy attacks but no breathlessness or swelling of the feet Social conditions fair Moderate smoker and uses alcohol

Examination —Well built young looking man Heart normal in size blood vessels sclerosed Blood pressure (B.P) 205/115 mm Hg Sedation test B.P went to 180/110 in three hours Eyes no fundal change other than those of arteriosclerosis Urine normal Blood urea 31 mg per 100 ml Intravenous pyelogram normal

Operation and Progress —June 16, 1948 right Smithwick type sympathectomy June 25 B.P. 170/100 no headaches since operation Oct 22 B.P 196/140, well and back at

TABLE I—FIGURES OBTAINED AT RENAL ANALYSIS BEFORE OPERATIVE TREATMENT AND AFTER FIRST STAGE

Case no	Operation and date	Date of observation	Blood urea (mg per 100 ml)	Period of observation (min)	Rt kidney			Lt kidney			Bladder		Wastage
					Vol (ml)	pH	Urea (%)	Vol (ml)	pH	Urea (%)	pH	Urea (%)	
1	Rt Smithwick	May 19 1948	31	10	3 9	5 4	1 6	4 9	5 4	1 1	6 2	0 5	Nil
	June 16 1948	June 30 1948	41	30	6 9	5 2	1 6	1 5	5 2	1 2	5 4	1 0	1 ml
2	Rt Smithwick	May 21 1948	36	10	0 2	6 0	Trace	12 5	6 8	0 4	6 8	0 15	Nil
	May 24 1948	June 3 1948	36	30	12 4	6 6	0 3	0 7	5 8	0 5	6 2	1 2	Nil
3	Rt Smithwick	Oct 21 1948	45	20	Nil	—	—	3 5	6 0	0 9	5 6	1 8	Nil
	Oct. 25 1948	Dec 2 1948	45	25	Nil	—	—	3 1	5 4	1 5	5 4	1·9	0 2 ml
4	Pt Smithwick	Dec 9 1948	43	20	4 0	6 8	0 3	10 0	6 8	0 3	6 8	0 8	Nil
	June 21 1949	Aug 11 1949	38	10	11 9	6 8	0 7	1 8	6 2	0 6	6 0	0 9	Nil
5	Rt Peet	Sept 16 1949	50	30	0 5	5 4	0 1	10 0	6 8	0 6	7 0	0 5	Nil
	Oct 3 1949	Oct 20 1949	50	10	4 0	7 2	0 7	5 5	7 2	1 0	7 2	0 9	0 5 ml
6	Lt Peet	April 27 1948	15	40	1 4	6 0	1 2	3 1	6 0	1 3	6 4	0 8	Nil
	May 4 1948	May 14 1948	—	30	0 8	5 2	0 2	2 1	5 4	2 1	5 8	2 4	0 8 ml
7	Lt Smithwick	June 28 1948	35	25	8 4	7 2	0 9	1 1	5 2	0 6	7 0	0 7	1 5 ml. urea 0 9% pH7
	July 21 1948												
	Rt Smithwick	Oct. 2 1948	55	25	13 3	7 0	0 8	1 8	5 4	1 6	7 0	1 0	1 5 ml urea 0 7% pH7
	Oct 21 1948	June 20 1949	63	20	10 0	7 0	1 2	0 4	—	0 1	—	—	Nil

In case 7 the analysis was repeated about a year after the first sympathectomy

TABLE II—STANDARD UREA CLEARANCE CALCULATED FROM TABLE I

Case no	Date of observation	$\frac{u}{B\sqrt{v}}$ Standard urea clearance (ml per min)		Blood pressure	Result and last blood pressure (mm Hg)	Follow up period
		Rt kidney	Lt kidney			
1	May 19 1948 June 30 1948	31 225 19 000	24 838 16 540	205/115 170/100	Bad 220/150	One year +
2	May 21 1948 June 3 1948	— 5 375	12 433 6 531	210/130 150/105	Definite reduction 160/120	One year 6 mos
3	Oct 21, 1948 Dec 2 1948	— —	8 366 11 738	220/130 150/100	Symptom free bad 240/140	One year
4	Dec 9 1948 Aug 11 1949	4 470 25 940	4 933 6 698	200/140 150/100	Significant reduction 170/110	11 mos
5	Sept 16 1949 Oct 20 1949	0 816 8 854	6 924 14 832	250/140 160/108	—	—
6	April 27 1948 May 14 1948	14 960	24 190	220/140 160/120	Definite reduction 160/100	One year 6 mos
7	June 28 1948 Oct 2 1948 June 20 1949	14 619 10 609 13 468	3 596 6 206 0 224	220/140 200/130 220/130	Significant reduction 170/110	One year +

In case 4 where the volume obtained from the right kidney exceeded 1 ml per minute the standard clearance was calculated to maintain uniformity

work July 1949 B P 210/140, having severe cardio vascular symptoms

This man had a wide pulse pressure and generalised arteriosclerosis He suffered from extremely severe headaches which were quite uncontrolled by medical treatment The intravenous pyelograms were normal and the optic fundi showed the changes of arterio sclerosis without retinitis or papilloedema Splanchni cectomy was therefore done on one side only, in order to relieve the headache, which it did The renal efficiency dropped by an amount roughly proportional to the diminution temporarily obtained in the blood pressure, and the late result was bad

Case 2 (Mr W Arthur Mackey's case)—Female aged 30 Seen May 21, 1948 For fifteen months had had very severe frontal headaches affecting vision with blurring of the right eye Two normal confinements Social conditions fairly good

Examination—Healthy looking small thin woman Blood vessels not sclerosed Heart not clinically enlarged B.P 210/130 Optic fundi discs normal, patch of exudative retinitis in left eye but none in right eye the usual changes in the vascular pattern Urine sterile and free from albumin Blood urea 36 mg per 100 ml Intravenous pyelograms and straight X ray films no renal abnormality

Operation and Progress—May 24 1948 right Smithwick sympathectomy June 3 B P 150/105 Dec 21 symptom free B P 180/120 standing, 170/110 lying Left Smithwick sympathectomy Nov 16, 1949 symptom free, B.P 160/100

This woman had typical essential hypertension with no history of renal disease, her symptoms were headaches and visual upset of fifteen months' duration Intra venous pyelograms were normal The optic fundi showed normal discs with a patch of exudative retinitis in the left eye At the first renal investigation her right kidney stopped secreting almost completely and at the examination ten days after operation (right splanchni cectomy) her left kidney in the same way virtually ceased secreting At this examination the right side showed some improvement in function while the function of the left kidney was less This patient has been followed for about eighteen months is symptom free, and has a blood pressure of 160/100

Case 3 (Mr Mackey's case)—Female aged 35 Seen Oct 21, 1948 For a year she had noticed that she was easily tired and breathless No urinary symptoms or visual upset For four months headaches had been seve diurnal During pregnancy three and a half years p her B P had been raised, two years later a second p had been terminated because the B.P was high, an then she had been under treatment for this complaint. father had died of internal hæmorrhage and her mo "shocks" Social history good

Examination—Good colour Healthy looking well-n ished woman B.P 220/130 Optic fundi discs no no exudative retinitis Urine specific gravity 1 01 albumin Blood urea 45 mg per 100 ml Straight X and intravenous pyelograms no abnormality in the urin tract

Operation and Progress—Oct. 25, 1948 right splanch cectomy Dec 2 B P 150/100 Jan 6, 1949 symp free, B.P 180/125 vertical, 200/120 lying Left splanch cectomy Nov 17, 1949 B.P 240/140, dyspnœa exertion

This woman developed hypertension as a result pregnancy During her first pregnancy three and a h years before, her blood-pressure had been high and subsequent pregnancy had had to be terminated becau of hypertension She also had a bad family histo both parents having died of hypertensive inciden The intravenous pyelograms were normal The op fundi showed no exudative retinitis, and the discs normal During both renal investigations the r kidney ceased secreting, although in the interval a r splanchnicectomy had been done The contralate kidney showed some slight improvement in functi The case has been followed for just over a year ar apart from dyspnœa on exertion, the patient is sympto free, but her blood pressure is 240/140, and the resu must be classed as bad

Case 4 (Mr Mackey's case)—Female aged 18 Se Dec 9, 1948 Had had occasional "bilious attacks" w very severe frontal headaches, over the past year, a occasional palpitation At an examination for superann tion, albuminuria and a high blood pressure had been four Nothing relevant in the family history Social conditions goo

Examination—Healthy looking well nourished girl B 200/140 Optic fundi normal Urine specific gravity 1 01 Bladder urine contained coliform organisms and pus cel but urine obtained from the kidneys was sterile Intraveno pyelography normal function, a little delay in the left sid but outline normal, slight clubbing of right calices suggesti of chronic infection

Operation and Progress—On sedation, B.P fell to 130/1 in three hours June 21 Right splanchnicectomy Oct. no symptoms except occasional palpitations, B P 160/1 vertical, 160/105 lying

On May 28, 1950, her own doctor reports that she is w with occasional headaches B.P 170/110 without previo rest The second sympathectomy has not yet been done

This girl had been found to have albuminuria on routine medical examination, and questioning h revealed occasional bilious attacks during the pa year There was no history of previous renal diseas although infection was found in the bladder urine an her intravenous pyelograms suggested chronic ren infection The renal urines were sterile and cell fre The family history contained nothing of note, and t optic fundi were normal There is much improvemen of the function of her right kidney after the splanchnice tomy on that side, and slight improvement of t function of the opposite kidney also The late resul when the treatment is completed seems likely to b satisfactory, since there is already a significant reductio in blood pressure eleven months after the single operatio

Case 5 (Mr J Sloan Robertson's case)—Female aged 4 Headaches for three years (occiput to vertex) worse an more frequent in recent months and accompanied by a feelin of fullness over the back of the shoulders Some darkenin of the skin of the face had been noted and puffiness of t ankles at night For two years had been easily tired and ha had angina of effort and nocturia One child aged 18 r known kidney trouble during pregnancy, but severe vomitin throughout

Examination—Florid, full faced, rather stout woman with mented skin and severe halitosis Teeth sound B.P /140 Urine specific gravity 1 010, sterile Intra ous pyelograms normal function, left renal out normal, right spastic in appearance and apparently concentrating the dye

Operation and Progress—Oct 3, 1949 right Peet's opera n Oct 20 B P 160/108

This woman had had severe headaches for three years, th a feeling of fullness over the back of the neck and oulders Recently puffiness of the ankles had been served During her single pregnancy she had had kidney trouble, but had severe vomiting The travenous pyelogram demonstrated spasticity of the ght renal pelvis During and after this investigation e had severe right abdominal pain, which recurred ter her operation (right Peet's sympathectomy) The tic fundi showed no gross changes The renal analysis owed a very poor secretion from the right kidney fore operation, with a considerable improvement venteen days after operation, an improvement in which e left kidney participated

Case 6 (Mr Sloan Robertson s case)—Female aged 35 or four or five years had had headaches of characteristic cessure type, accompanied by palpitation At first they ere not severe, but two years ago they had become much orse and more frequent At that time she had had an bortion at two months and was treated with thyroid extract nd sedatives In November, 1947 she had had a syncopal ttack, and her blood pressure was found to be raised Since December, 1947, the headaches had been severe, and there ad been a tight feeling in the left chest In 1937 one child ad died ten days after birth. Two children aged 9 and 6, ere alive and well Social conditions reasonably good

Examination (April 27)—Florid obese woman. Pulse rate 0, heart-sounds pure B P 220/140 Blood urea 15 mg er 100 ml Radiography of the chest shows enlargement of he heart Fundus of right eye engorged veins, abnormal rteriovenous crossings, hæmorrhages, exudate and fuzziness f the disc margin Left optic fundus similar changes, but he disc was clearer, though with some exudative retinitis

Operation and Progress—May 4, 1948 left Peet's splanch nicectomy May 14 B P 160/120 May 19 right Peet's splanchnicectomy Sept 9 1949 B.P 140/100 Dec 1 symptom free, B.P 160/100

This woman had five years' history of headaches and palpitation, initially not severe but worse after a mis carriage two years ago Raised blood-pressure had not been observed until five months ago She had no history of renal disease, and no toxæmia had been noted during her three pregnancies The intravenous pyelo grams showed no abnormality The optic fundi showed exudative retinitis on both sides and some papillœdema of both discs The renal estimations done before and after a left Peet's sympathectomy showed a remarkable difference in the ability of the left kidney to concentrate urea after the operation Unfortunately, standard clearance values could not be calculated, owing to the absence of the necessary blood urea The right kidney showed at this time the same cessation of secretion noted in case 2 This case has been followed for over eighteen months and the patient is symptom free with blood pressure 160/100

Case 7 (Mr Sloan Robertson's case)—Male aged 42 Seen June 28 1948 Nineteen weeks previously had developed influenza, since when he had had continuous frontal headache For five weeks blurring of vision no other symp toms He had had acute nephritis in 1936, cholecystectomy in 1941, and appendicectomy in 1948

Examination—Thin healthy looking man B.P 220/140 Optic fundi flame shaped hæmorrhages and exudative retinitis, both sides Intravenous pyelograms normal function and outline to the right kidney, function of the left a little delayed renal pelvis spastic in type

Operation and Progress—July 21 1948 left Smithwick splanchnicectomy Oct 2 B P 200/130 Oct 11 right Smithwick splanchnicectomy Nov 2 B.P 190/125

On May 10, 1949, he was readmitted because of a cerebro vascular accident, five weeks before, with permanent changes in reflex response of right leg and left facial weakness B P 230/130 Intravenous pyelograms normal function and outline of right kidney, definite delay in excretion from the left kidney, the outline of which is extremely spastic Muscle biopsy gross hydremia of the parietal tissues but no irre versible changes in the peripheral arterioles The patient was discharged in August without further surgical treatment On Dec. 6 his doctor reported "He is confined to bed, but goes out to the football match on Saturday in a wheeled chair B.P 170/110"

This man had a short history of headache and blurring of vision following influenza He had nephritis twelve years before Both optic fundi showed hæmorrhages and exudative retinitis Intravenous pyelograms revealed a spastic left renal pelvis, and the initial renal analysis showed a marked difference in the clearance values, in favour of the right kidney

After a left Peet's sympathectomy there was considerable improvement in the function of that kidney A year later it seemed that the result was not good, and the patient was investigated further, when an extreme degree of spasticity of the left renal pelvis was found on intravenous pyelography, similar to that shown in another patient who recovered after nephrectomy (Maitland 1949) Analysis of the renal urines showed virtually no function on that side These findings and the result of the muscle biopsy suggested that in this case the left nephrectomy which was considered when the sympathectomy was performed might have given a better result than that operation

The patient has made a remarkable partial recovery from this hypertensive crisis and is at present on a salt free low protein diet with restricted fluids, but the result must be regarded as bad

DISCUSSION

Splanchnicectomy or preganglionic denervation of the kidney, in patients such as case 1, where the changes in the vascular architecture are fixed, depresses function through the lowering of filtration pressure caused by the drop in blood pressure, or has no apparent effect, as in case 3 If improvement takes place it can show in one of two ways, or possibly a combination of both The urinary volume may increase without materially altering from the character of a glomerular filtrate, or the volume may remain much the same but the urea content rise The first of these alterations in composition would occur if an increased number of cortical nephrons were brought into action, and the second if the nephrons in action had not increased in numbers but the function of their tubules had improved This view is tenable whether the tubule is regarded as a site for the excretion of urea or as the site for resorption of water Both of these effects have been observed in this group of cases

A study of the figures for renal function alone in these tables reveals that in four cases sympathectomy has produced an improvement in the standard urea clearance in the denervated kidney In a fifth case, where it was unfortunately impossible to calculate the postoperative clearance values, the figures of the analysis suggest that a similar beneficial effect on renal function has taken place

In cases 2, 4, and 5 the increased volume of urine obtained from the kidney after sympathectomy may be regarded as presumptive evidence of increase in the number of cortical nephrons in action Besides this increased volume in all three there is an increased urea content, indicating improved tubular function

In cases 6 and 7 there is no significant difference in the volume excreted by the denervated kidney There is, however, an increase in urea content sufficient to suggest an improved tubular activity in the functioning nephrons These results are not regarded as evidence

of an increased renal blood flow, but they suggest that in some cases at least sympathectomy leads to a redistribution of the blood flow through the kidney which has a beneficial effect on function

In the five cases followed longer than a year a correlation of the analyses with the late results demonstrates that in the two (cases 2 and 6) where the blood pressure still shows definite improvement the pattern of secretion between the kidneys had altered in a similar manner at the second analysis, the kidney still possessed of its nerve supply secreting poorly, while the denervated kidney functioned well, secreting in one case a large volume of urine and in the other a urine of higher concentration This pattern was not observed in any of the other cases Of the three cases which are bad results, one was not expected to be otherwise One of the remaining two had the same complete stoppage of secretion before and after sympathectomy, the other showed only a slightly improved function as a result of denervation This case may have been a unilateral renal hypertension and might have given a better result from a left nephrectomy

SUMMARY

In seven cases of hypertension a differential renal analysis was done before and after the first splanchnicectomy

In one case renal function diminished roughly in proportion to the fall in blood pressure, in one case no change was noted, and in the others there was an apparent improvement in renal function estimated in this way

In 5 cases followed for a year or more an attempt has been made to correlate the results of the renal analysis with the late result of the treatment

I have to acknowledge with thanks the generous coöperation of my colleagues Mr W Arthur Mackey, F R C S E, and Mr J Sloan Robertson, F R C S, who permitted the urological assessment of their cases and gave me free access to their case records Without their help in these matters this work could not have been readily completed I have also to thank the medical superintendents of the Eastern District Hospital, Killearn Hospital, and the Western Infirmary, Glasgow, for permission to use their records, and once again to acknowledge my debt to Mr W W Galbraith for facilities in the urological clinic Western Infirmary

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AUREOMYCIN AND AMŒBIC DYSENTERY

T G ARMSTRONG M D Camb, M R C P
A J WILMOT D M Oxfd, M R C P
R FLSDON DEW M D Edin

From the Amœbiasis Research Unit Council for Scientific and Industrial Research King Edward VIII Hospital Durban

'AUREOMYCIN' was successfully used in 3 cases of amœbic dysentery by McVay et al (1949) A larger series of 38 cases, of which 27 (71%) were apparently cured was reported by Hughes (1950) but these cases were not acute and most of them had failed to respond to other forms of treatment Anderson and Anderson (1950) were able temporarily to clear macacus monkeys of experimental infections Their in vitro experiments, while those of Bradin and Hansen (1950) suggested that aureomycin was not directly amœbicidal but acted indirectly by destroying bacteria necessary to the life of the amœba—a view we have held in respect of this and other antibiotics

We record below our results with aureomycin in a standard series of fifty two African cases of acute amœbic dysentery, five African cases of exceptional severity, and four milder European cases

MATERIAL AND METHOD

In Durban and its environs many thousands of native Africans live in overcrowded shacks without any form of sanitation Amœbic dysentery is endemic and over 2500 cases a year are admitted to this hospital alone The form of the disease is acute and serious with severe colonic ulceration and myriads of trophozoites in the stools In 1946 the case mortality rate was 4 5% The disease, therefore, produces large numbers of patients who may be regarded as a uniform population on which the various therapeutic agents may be tested on a large scale

For therapeutic trials some selection of patients was necessary For domestic reasons only males were used All patients were complaining of diarrhœa with blood and mucus, showed ulceration at sigmoidoscopy, and had actively motile amœbæ in stools or scrapings The attack was the first in all but six of our fifty two cases and in these six the original attack had occurred more than 12 months before we saw them Cyst passers were not accepted for the series Cases showing chloride deficiency, abdominal distension, sloughs on sigmoidoscopy, or signs which have been found to presage perforation or ileus, were excluded because it was thought unjustifiable to experiment on such severely ill patients

Sigmoidoscopy was done daily until all ulcers had healed, and on the 10th, 15th, 20th, and 27th days when stool examination was also carried out both by direct and zinc sulphate flotation methods When possible, scrapings from ulcers were examined for parasites Results were classified into three categories

Success—Symptom free All ulcers healed and no amœbæ found in stool examination

Possible failure—Usually symptom free One or more ulcers still open, but amœbæ not found in stools or scrapings

Absolute failure—Open ulcers still present and motile amœbæ still demonstrable

A study of the changing bacterial flora in some of these cases will be published later

Follow up was attempted at monthly intervals after the completion of treatment, but, in spite of the offer of payment to those Africans who returned, the results were very incomplete

DOSAGE

Aureomycin was given by mouth in doses of 0 25 g four times daily at 6 hourly intervals for 15 days No other active drug was given, but from the 15th day onwards a placebo of calcium gluconate gr 5 t d s was given by mouth

RESULTS

Of the fifty two patients, one who was apparently cured at 15 days refused further observation and discharged himself He is accepted as a success at 20 days but is discarded from the series at 27 days because he cannot be assumed to have remained well One patient an absolute failure at 20 days, was removed from the series and given emetine and Diodoquin He is included in the figures at 27 days because he may reasonably be considered to have remained a failure on this date

Table I shows the results as treatment progressed The figures at 20 days should be compared with the figures given in table II for a number of other drugs

Daily sigmoidoscopy showed a remarkably rapid rate of healing Twelve cases were completely healed by the 4th day, and at the end of 7 days no less than twenty nine were healed Before treatment, ulcers were nearly always

TABLE I—RESULTS OF TREATMENT OF 52 CASES OF AMŒBIC DYSENTERY WITH AUREOMYCIN

—	Days of treatment							
	10		15		20		27	
Success	35	67%	40	77%	49	94%	48	94%
Possible failures	16	31%	7	13%	2	4%	2	4%
Absolute failures	1	2%	1	2%	1	2%	1	2%
No sigmoidoscopy	—		4	8%	—		—	
Totals	52		52		52		51	

covered with mucopurulent exudate, but this soon cleared Healing usually began at the periphery of the ulcers, but sometimes the whole surface of the ulcer appeared to acquire epithelium simultaneously in a matter of a few days One of the striking effects of aureomycin was the normal appearance of the mucosa between the ulcers In these acute cases the mucosa between the ulcers is usually inflamed and œdematous, and with ordinary amœbicidal drugs it takes several weeks to return to normal, with aureomycin the return to normality occurs in a few days

Clinical improvement preceded healing by several days, and diarrhœa ceased usually after 1–2 days No toxic side effects were noted, but the African is notoriously reticent about minor complaints

Disappearance of amœbæ was equally rapid and dramatic Daily examination of exudate obtained at sigmoidoscopy failed to reveal amœbæ in six cases on the 2nd day, in twelve cases on the 3rd day, and nineteen cases on the 4th day By the 4th day, therefore, thirty seven out of fifty one cases had been cleared of amœbæ By the 9th day all cases were free of amœbæ, with the single exception of the patient who was an absolute failure throughout It was found in most cases that on the 3rd or 4th day the amœbæ greatly increased in size, sometimes reaching a length of 90 μ. It seemed almost as though their powers of division had been destroyed, for they usually vanished a day after the appearance of these "giant" forms The two cases classified as "possible failure" were symptom free

Our follow up, owing to the lack of cooperation of our patients, has been very incomplete, and full reports are not yet to hand However, those available paint a somewhat disappointing picture One month after discharge twenty seven of our successful patients returned Twenty were well, free of amœbæ, and without ulceration at sigmoidoscopy But the other seven came because they were sick, and all these were found to have ulcerated colons and large numbers of trophozoites in their scrapings One quickly died from fulminating amœbiasis and clinical diphtheria Three of these relapses occurred within 2 weeks of discharge, two within 3 weeks and two at 4 weeks One patient had a hepatitis, and all, apart from the one who died, responded to emetine and diodoquin

Seven "follow-ups" are available at 2 months, two at 3 months, and one at 4 months All show normal bowels and negative stools So far we have seen no relapses after the end of the first month from discharge

FIVE SEVERE AFRICAN CASES

These patients were considered too ill to be included in the experimental series This type of case had never before been accepted for an experimental series, because of the risk to life involved in not using a proven amœbicidal drug But our early experiments with aureomycin tempted us to try it. In addition we had learnt that the findings at sigmoidoscopy described below meant unusual delay before healing was complete

Three patients were found at sigmoidoscopy to have very large ulcers covered with a thick tenacious slough resembling the later stages of an ulcerated skin carbuncle Two of these patients were dehydrated In one, the urinary chlorides were only 2 0 g per litre Treatment was the same as for the main series, but intravenous drips were given when necessary One of these patients was free of amœbæ on the 3rd day, another on the 5th day, and the third on the 7th day In one case all ulcers were healed on the 17th day and follow up a month after discharge showed the patient to be well, without ulceration of the colon The second patient had open ulcers with exudate on the 20th day, though much healing had taken place and no amœbæ could be found He was given emetine and diodoquin on the 20th day, and was healed by the 34th day The third showed only slight improvement after 7 days of aureomycin although again no amœbæ could be found Emetine was added to aureomycin and he made a slow recovery Ulcers were still open on the 37th day, but on the 55th day these were found to have recently healed

In a fourth patient the whole rectum was seen at sigmoidoscopy to be covered with a tenacious greenish-black and grey slough, which was later passed as a necrotic tubular cast of the bowel Aureomycin cleared this patient of amœbæ and left a clear granular surface on which a stricture subsequently developed Emetine and diodoquin were given after the 20th day, but it was many weeks before the bowel was healed We feel that the results in these grave cases were most encouraging

One fulminating case of amœbic dysentery was treated with aureomycin in larger doses—four 250 mg capsules in 4 hours, ten capsules in 20 hours, and six in the next 24 hours The patient had been ill for three weeks and was admitted gravely ill, with bloody diarrhœa, distension of the belly, a blood pressure of 90/75, dehydration, and a urinary chloride level of 1 g per litre Trophozoites were found in the stools He was given 5 5 litres of normal saline intravenously in 3 hours and rallied Next day he was well hydrated, but he suddenly grew worse and died Necropsy showed a friable congested large bowel with almost continuous white exudate and sloughs from cæcum to rectum No perforations were found

EUROPEAN CASES

A European business man of 42 gave a fortnight's history of bloody diarrhœa Sigmoidoscopy showed many superficial ulcers covered with exudate containing great numbers of amœbæ All ulcers were healed on the 6th day of aureomycin treatment On the 3rd day giant amœbæ were seen and from the 5th day onwards no amœbæ could be obtained from bowel scrapings After 6 weeks he wrote that he was well, but his stools have not yet been re examined

A European child of 11 complained only of lassitude and headaches Trophozoites were found in her stools Sigmoidoscopy was normal On aureomycin, amœbæ disappeared from the stools on the 5th day Follow up with zinc sulphate flotation technique was negative 2 months later Her symptoms were relieved within 2 weeks

Two other patients, one a baby of 10 months, were successfully cleared of trophozoites, and follow up at one month was negative Unfortunately we have no information on the effects of the drug in cyst passers

COMPARISON OF AUREOMYCIN AND OTHER FORMS OF TREATMENT

For 4 years this unit has been engaged in therapeutic trials, the results of which have been published in three papers and in a letter to THE LANCET (Armstrong et al 1949, 1950) Some of these results are reproduced in

TABLE II—EXPERIMENTAL THERAPY OF ACUTE AMŒBIC DYSENTERY ASSESSMENTS AT 20 DAYS

Series	Therapy	No	Success (%)	Probable failure (%)	Absolute failure (%)	Removed from therapy (%)
A	Emetine gr 15 alone	50	50	22	28	—
B	Diodoquin alone	50	58	18	24	—
C	Emetine gr 15 and diodoquin	61	74	24	2	—
G	Diodoquin and emetine bismuth iodide	50	80	14	6	—
I	Penicillin and sulphasuxidine followed by emetine and diodoquin	56	95	5	0	—
J	Penicillin, sulphasuxidine emetine and diodoquin simultaneously	49	90	8	2	—
K	Sulphasuxidine emetine and diodoquin	49	88	10	2	—
L	Penicillin and sulphasuxidine	11	82	18	0	—
P	Sulphasuxidine alone for 20 days	57	54	12	7	27
Q	Penicillin alone for 20 days	55	46	16	16	22
S	Phthalylsulphacetamide alone	12	17	12	66	—
T	Carbarsone alone	50	48	10	6	36
U	Emetine bismuth iodide alone	55	71	3	2	24
V	Aureomycin alone	50	94	4	2	—

Once we had established a reasonably satisfactory form of therapy it was felt that we could no longer risk the lives of those whose condition was deteriorating with the form of therapy under trial and where this occurred patients were removed from treatment and placed on one or other of the forms of therapy which we knew were effective. These figures are shown in the last column. Naturally the earlier forms of therapy show no cases in this category because no better treatment was available

table II for purposes of comparison with those of aureomycin. In all these previous series the criteria of diagnosis and selection were strictly comparable to those of the present series.

As a 27 day assessment was not made in all the previous series, our standard of immediate cure for comparison of aureomycin with other drugs has been taken at 20 days. It can be seen that aureomycin has been much the most successful single therapeutic agent, and the results of treatment with the standard amœbicidal drugs fall far short of it. The only comparable effects were obtained with a combined treatment of penicillin, succinyl sulphathiazole, emetine, and diodoquin.

Our results show that aureomycin, when used alone, is capable of producing a very high cure rate at 20 days. In addition by the 9th day of treatment, 98% of the patients had been cleared of amœbæ. It is interesting to compare the success rate and absolute failure rate of aureomycin with those for emetine. Successes with emetine are 50% and with aureomycin 94%. Absolute failures with emetine are 28% and with aureomycin 2%.

Comment has been made on the rapidity with which the ulcers healed. Though this is the first series in which we have watched the ulcers daily, we feel that the rapidity of healing with aureomycin is much greater than with any other drug we have used.

Our experience with our small number of "follow ups" has been a great disappointment, for 14% of our successful cases have relapsed in the first 4 weeks after discharge. Our impression is that the relapse rate is higher with aureomycin than with other drugs used in the past. Though these early returning cases are classed as relapses, it must be borne in mind that these patients may possibly be peculiarly liable to re-infection, by virtue of their disturbed bacterial flora. In the circumstances to which they return after leaving hospital, re-infection is extremely likely. Recrudescence, however, remains the most likely explanation.

Our use of aureomycin alone in this series has been, of course, an attempt at scientific experiment and adventure rather than an attempt at therapeutic recommendation. The high relapse rate clearly shows that aureomycin should not be used alone but should be combined with one of the hitherto accepted amœbicides.

We think that with aureomycin the dosage of emetine or emetine bismuth iodide could be drastically reduced, and, though we have as yet no evidence, we believe that association of diodoquin with aureomycin would reduce the relapse rate satisfactorily. The great potency of aureomycin suggests its use as the drug of selection in acute ulcerative amœbiasis, and, though other agents must be used as well, its advent has brought closer the day of ambulant treatment for this disease.

SUMMARY AND CONCLUSIONS

Fifty two cases of acute ulcerative amœbic dysentery have been treated with aureomycin alone. In the great majority this drug quickly relieved symptoms, cleared the patient of amœbæ, and induced healing of ulcers.

Aureomycin effects immediate cure in a higher proportion of cases than does emetine or any other single drug, but the relapse rate in the first month after cessation of treatment is high.

Aureomycin should not be used alone but should be combined with some other known amœbicidal agent.

Our thanks are due to the Council for Scientific and Industrial Research and to the Natal Provincial Administration. This work could not have been undertaken without the generous gift by Lederle Laboratories Division, American Cyanamid Company, of the very large quantities of aureomycin used.

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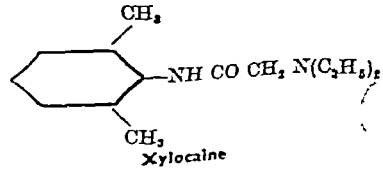
CLINICAL TRIAL OF XYLOCAINE IN LOCAL ANÆSTHESIA

D. M. CARNEGIE
M.B. Lond., D.A.
CHIEF ASSISTANT, DEPARTMENT OF ANÆSTHETICS, GUY'S HOSPITAL

A. J. H. HEWER
M.B. Lond., D.A.
CONSULTANT ANÆSTHETIST, MIDDLESEX HOSPITAL

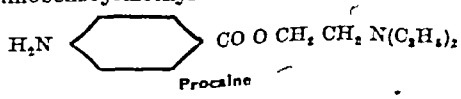
AT the invitation of the Faculty of Anæsthetists of the Royal College of Surgeons of England, we have carried out a clinical trial of the Swedish local analgesic 'Xylocaine'. Trials in Sweden (Gordh 1949, Bremer et al. 1948) and in the United States (Dabbs and Southworth 1949) suggest that this drug has some advantages over other local analgesics now in use.

Xylocaine, or *o*-diethylamino-2,6-dimethylacetanilide, was first synthesised in 1943 by Löfgren (1948) and Lundquist (1946) at the Organic Chemistry Institute of the University of Stockholm, but they did not publish their results until 1946. The drug is a member of a group of basic anilides, and has the following structural formula:



Xylocaine

It bears a superficial resemblance to procaine, which is *p*-aminobenzoyldiethylaminoethanol:



Procaine

But xylocaine is not a *p* aminobenzoic ester, nor is it closely related chemically to any of the commonly used local analgesics

The pharmacology and toxicology of the drug have been fully investigated by Goldberg (1947, 1948), who showed that although in concentrations above 0 5% its absolute toxicity is greater than that of procaine, the relative toxicity of xylocaine is lower because of its greater potency

CLINICAL TRIAL

In cooperation with our surgical colleagues, we have used xylocaine as a local analgesic in 138 cases for the following procedures

Surface analgesia	Bronchoscopy Ophthalmic surgery
Infiltration analgesia	Ventriculography (of brain) Minor surgery in outpatients Varicose veins Reduction of fractures (infiltrating fracture sites) Thoracoplasty Abdominal field block
Regional nerve blocks	Mandibular Maxillary Stellate ganglion (diagnostic) Brachial plexus Elbow, wrist, and digital Intercostal Posterior splanchnic Lumbar sympathetic (diagnostic and therapeutic) Caudal Sciatic

1 *Surface Analgesia*—For bronchoscopies, 2% xylocaine with 1/80,000 adrenaline produces analgesia which is fairly satisfactory but not so profound as that produced by 10% cocaine This also applies to ophthalmic surgery, but we feel that 4% xylocaine would be more satisfactory From observations of the eye after the application of 0 5% and 2% xylocaine without adrenaline, it appears that this analgesic does not either constrict or dilate the vessels, neither does it dilate the pupil nor produce mistiness of the cornea As with cocaine, a very slight stinging sensation is sometimes felt when xylocaine is instilled into the conjunctival sac The stinging is more pronounced when xylocaine is used with adrenaline This is undoubtedly because the pH of 2% xylocaine by itself is 6 5, whereas that of 2% xylocaine with 1/80,000 adrenaline is 3 9, the pH of 5% cocaine solution being 5–5 5 (These pH readings have been determined by the "glass electrode" method on samples of the solutions we have used)

2 *Infiltration*—In these cases, xylocaine with and without adrenaline has been used in concentrations ranging from 0 5 to 2% For thoracoplasties, however, xylocaine has been shown to be effective in concentrations as low as 0 25% with 1/400,000 adrenaline

3 *Nerve blocks*—For most of these, concentrations of xylocaine between 1% and 2% were used with 1/250,000 adrenaline For caudal block, a 1% solution with adrenaline sufficed, and this had the advantage over procaine that the onset of the analgesia was two to three times as rapid the effect lasted about 3 hours In one case, a man of 73 had difficulty in micturition post-operatively, but in due course, after catheterisation, normal function returned.

In digital ring blocks, where adrenaline cannot be used, 2% xylocaine has the advantage that its effect lasts at least twice as long as that of procaine

In therapeutic and diagnostic nerve-blocks the long duration of action of xylocaine is particularly valuable, and for this purpose 2% xylocaine with adrenaline was used.

RESULTS

It was not possible to obtain numerical results in these cases, and for this reason we performed further investigations which are detailed later, but even from this first series certain points do emerge

Xylocaine produces satisfactory analgesia, and in every case in which it was used without a general anæsthetic the sensory block outlasted the operation With nerve blocks it was observed that xylocaine abolished tactile as well as pain transmission

The motor paralysis produced by xylocaine is much more complete than that produced by other local analgesics This is not always an advantage clinically but it suggests that the drug can more effectively penetrate nerves with thick medullary sheaths

In a few abdominal cases which had an intercostal block accompanied by very light general anæsthesia we were disappointed because the motor block apparently wore off after about 2½ hours This has been seen before with 'Nupercaine' and adrenaline mixtures, and the fault was believed to be not in the block but in the general anæsthetic, which had been allowed to become very light indeed, the administration of 0 1–0 2 g of thiopentone intravenously caused an immediate return of the relaxation

With infiltration techniques, the area of analgesia obtained was markedly wider than the area infiltrated This feature of xylocaine, combined with its high penetrating power, makes it valuable for any nerve block where accurate placing of the point of the needle is difficult

Side effects

Unwanted side-effects were rare in our series, 1 4 g of xylocaine with adrenaline being the largest dose injected at any one time One patient vomited after 0 8 g of xylocaine with adrenaline had been injected Transient drowsiness and tremor have been noted, but these have not been severe enough to give rise to alarm, the slight tachycardia sometimes produced has been no greater than with other local analgesics mixed with similar quantities of adrenaline

Small falls in blood-pressure (10–20 mm Hg) have been noted after infiltration analgesia, and greater falls (systolic down to 50–60 mm Hg) after posterior splanchnic with posterior intercostal block In this latter group the fall is of course due to sympathetic block, and the pressure can be quickly restored with 'Methedrine' or some similar vasopressor drug

No tissue irritation, either immediate or late, has been noted after an injection of xylocaine, and after the analgesia has worn off there seems to be even less tenderness at the injection site than there is with procaine.

SUBCUTANEOUS SKIN TESTS

To obtain accurate and more comparable results than were possible with the above techniques, we carried out a series of tests with various local analgesic solutions in normal volunteers

Each subject received up to 6 injections of 1 ml. subcutaneously in various parts of the forearms, and the time of onset, duration, and spread of analgesia were investigated by response to pin prick The end-point was taken as the time when complete analgesia disappeared, although it was noted that the original area of analgesia started to diminish in size about half an hour before it entirely disappeared The character of the analgesia and its after effects could also be noted Some of the results obtained were as follows

EXPERIMENT 1 (16 VOLUNTEERS)

Analgesic solution	*Average duration of analgesia*
Xylocaine 0 5%	3 hr *
" 2·0%	2 hr 54 min *
0 5% with adrenaline 1/200 000	5 hr 48 min
2 0%	6 hr 45 min

EXPERIMENT 2 (8 VOLUNTEERS)

Xylocaine 2 %	1 hr	35 min
Nupercaine 0 1 %		44 min
Procaine 2 %		47 min
Xylocaine 2 % with adrenaline 1/200 000	6 hr	54 min
Nupercaine 0 1 %	4 hr	42 min
Procaine 2 %	4 hr	53 min

EXPERIMENT 3 (7 VOLUNTEERS)

Xylocaine 0 5 % with adrenaline 1/100 000	5 hr	1 min
0 5 % " 1/250 000	4 hr	23 min
0 5 % 1/500 000	3 hr	13 min

* From these results it appears that 0 5% xylocaine acts longer than 2 % but the difference of 6 minutes is well within the limits of the experimental error and is not significant

From these tests the following additional conclusions can be drawn

(1) The onset of analgesia is more rapid with xylocaine than with procaine this was less evident with skin tests than with nerve blocks but in every volunteer the analgesia had come on before there was time to test with pin prick

(2) The spread of the area of analgesia is wider with xylocaine than with procaine, each being given without adrenaline

(3) The duration of action is much longer with xylocaine than with procaine and longer with xylocaine and adrenaline than with procaine and adrenaline of the same concentration (experiment 2)

(4) The effect of 0 5% xylocaine lasts as long as that of 2% without adrenaline, and when adrenaline is added to each, the ratio of duration with 2% xylocaine to duration with 0 5% xylocaine is only about 8 7 (experiment 1)

(5) The critical dilution of adrenaline appears to be in the region of 1/250,000 (experiment 3)

(6) Xylocaine appears to be relatively non irritant to the tissues, since no pain developed either on injection or on return of sensation In 2 cases out of 26, however, there was slight tenderness on palpation, probably due to the formation of a hæmatoma

It is realised that these subcutaneous tests do not necessarily conform to clinical conditions In deep infiltrations into more vascular areas, for example, the duration of action is shorter because the substance is carried away by the circulation The tests do serve, however, as a basis for a comparative study

The findings suggest that xylocaine compares favourably with most analgesics in common use, and in our view this substance merits further investigation

SUMMARY

Xylocaine has been used as a local anæsthetic in 138 cases It is a relatively non irritant analgesic substance of low relative toxicity with rapid onset and prolonged duration of action In a concentration of 0 5% with adrenaline it produces almost as long an analgesia as 2% solutions Tactile as well as pain sense is lost It can be used for topical as well as infiltration analgesia In the eye it produces no dilatation of the pupil or mistiness of the cornea Adrenaline 1 in 250 000 is more suitable than 1 in 100,000 The dosage is the same as for procaine with a maximum of 1 0 g , although as a rule lower concentrations of xylocaine are satisfactory

We wish to thank the Faculty of Anæsthetists for the opportunity to carry out this trial also the Astra Laboratories, of Södertälje, Sweden, Messrs C Tennant Sons & Co and Messrs Duncan Flockhart & Co for their generous supplies of xylocaine and last but by no means least our colleagues and volunteers for their help and coöperation

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TRANSMISSION OF STAPHYLOCOCCAL ANTITOXIN (ANTI-HÆMOLYSIN) FROM MOTHER TO CHILD

JOHN MURRAY
M.D Camb
DIRECTOR OF PATHOLOGY

ROY M CALMAN
M B Glasg
BACTERIOLOGIST

ANNE LEPINE
M.R C S
BACTERIOLOGY REGISTRAR

BERNHARD BARON MEMORIAL RESEARCH LABORATORIES, QUEEN CHARLOTTE'S MATERNITY HOSPITAL, LONDON

THE transmission of immunity from mother to child has been the subject of a great deal of experimental work in animals but little in man And because of the anatomical differences the studies on lower animals cannot safely be used as a basis for conclusions on human transmission

The work of Barr and her colleagues (1949, 1950) on the transmission of diphtheria antitoxin from mother to child has produced valuable and interesting results some features of which are difficult to explain, in particular, they found a higher level of diphtheria antitoxin in cord blood than in maternal blood during

TABLE I—ANTITOXIN LEVELS OF MATERNAL, CORD, AND INFANT'S BLOOD

Case no	Staphylococcal anti hæmolysin blood levels (units per ml)			Relation between maternal and cord blood levels	
	Maternal	Cord	Infants	Difference (units per ml)	Difference / Maternal level x 100
1	0 68	> 0 95	0 76	> 0 27	> 40
2	0 29	0 76	< 0 76	0 47	165
3	0 29	> 0 95	> 0 95	> 0 66	> 234
4	0 43	> 0 95	0 76	> 0 53	> 123
5	0 49	0 76	> 0 79	0 27	55
6	0 45	> 0 79	> 0 79	> 0 34	> 75
7	0 26	0 48	0 64		
8	0 26	0 76	0 55	> 0 5	> 190
9	0 53	> 0 79		0 26	50
10	1 58	1 58	> 0 95	Nil	Nil
11	< 0 26	0 19	0 19	< −0 07	
12	0 39	0 55	0 76	0 16	38
13	< 0 26	0 19	0 19	< −0-07	
14	0 45	> 0 79	0 63	> 0 34	> 75
15	0 08	0 08	0 26	Nil	Nil
16	0 79	1 58	> 0 80	0 79	100
17	0 63	1 58	> 0 80	0 95	150
18	0 40	0 53		0 13	33
19	0 39	0 53		0 14	33
20	0 39	> 0 79		> 0 40	> 100
21	0 45	0 69	0 69	0 24	50
22	0 63	0 69	> 0 86	0 06	8
23	0 49	0 45	> 0 79	−0 04	− 8
24	0 69	1 58	> 0 79	0 89	130
25	0 39	0 21	> 0 26	−0 18	− 46
26	0 26	0 13	0 15	−0 13	− 50
27	< 0 26	0 26	0 26		
28	0 39	0 63	> 0 79	0 24	61
29	1 58	1 58	> 0 79	Nil	Nil
30	1 58	0 87	1 72	−0 71	− 45
31	0 39	0 27	0 43	−0 12	− 30
32	0 49	0 63	1 58	0 14	28
33	0 45	0 39	0 53	−0 06	− 17
34	0 08	0 08	0 45	Nil	Nil
35	0 26	0 08	0 45	−0 18	− 70
36	0 39	0 53	0 63	0 14	58
37	0 39	0 63	0 63	0 24	60
38	0 08	0 08	0 16	Nil	Nil
39	0 26	0 39	0 53	0 13	50
40	0 26	0 53	0 49	0 27	104
41	0 26	0 45	0 53	0 19	71
42	0 63	0 63	0 63	Nil	Nil
43	0 26	0 63	0 53	0 37	140
44	0 16	0 26	0 26	0 10	62
45	0 39	0 53	0 79	0 14	28
46	0 08	0 16	0 26	0 08	100
47	0 45	1 58	0 79	1 13	240
48	0 79	1 58	1 58	0 79	100
49	0 16	0 26	0 39	0 10	66
50	1 58	1 58	1 58	Nil	Nil
51	0 63	1 58	1 58	0 95	150
52	0 26	0 39	0 45	0 13	50
53	0 63	1 58	3 16	0 95	150
54	0 63	1 58	1 58	0 95	150
55	0 26	0 53	0 79	0 27	104
56	0 63	1 58	0 63	0 95	150

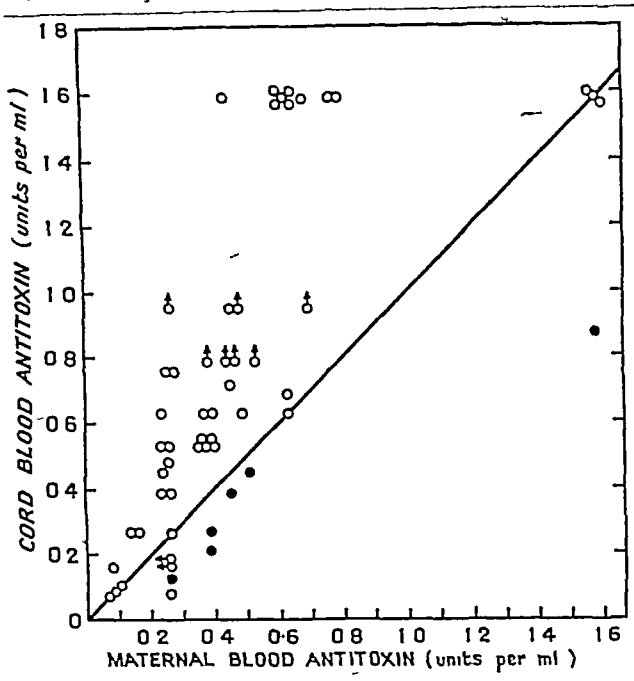

Fig 1—Relation between antistaphylococcal hæmolysin levels in maternal and cord blood in 56 cases Solid circles denote cases in which the antitoxin level was higher in the infant s peripheral blood than in the mother's Arrows indicate the direction in which the points would have moved had an end-point been reached in those particular cases

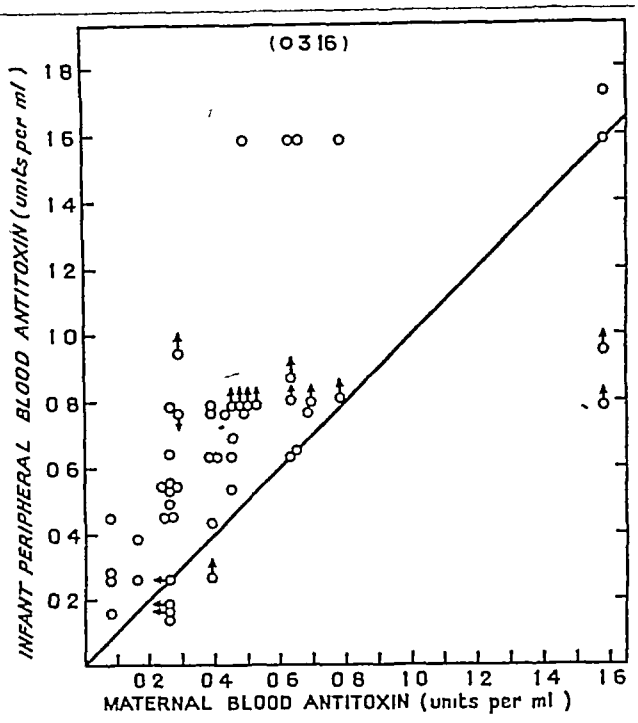

Fig 2—Relation between antistaphylococcal hæmolysin levels in maternal and infant s peripheral blood in 51 cases

delivery It was thought that the transmission of staphylococcal antitoxin should also be studied, to see if the results were comparable An investigation was therefore undertaken to compare the amounts of staphylococcal antitoxin (anti hæmolysin) in blood samples obtained from the mother during delivery, from the umbilical cord, and from the newborn baby, the object being to establish how far staphylococcal antitoxin, likely to be present in the mother, is transmitted to the baby, and in what amounts

TECHNIQUE OF INVESTIGATION

In 56 cases samples of clotted blood were obtained from a vein of the mother during labour, from the placental end of the cut umbilical cord before delivery of the placenta, and from the baby, by heel prick, within 24 hours of its birth Some trouble was experienced initially in obtaining enough blood to provide sufficient serum for a complete titration In a few of the earlier cases, therefore, no end point was determined, but nevertheless in most of these instances the result is conclusive

The materials used in estimating the antitoxin levels were

Standard Staphylococcal Toxin (0 033 ml = 1 unit)—Standard toxin was diluted for the tests by adding 0 66 ml of toxin to 20 ml of borate buffer so that 1 ml contained 1 unit of toxin. A series of dilutions was then made from this solution as follows 1/3, 1/2, 1/1 75, 1/1 5, 1/1 25 and 1/1 For the control tests the standard toxin was diluted 1/100

Standard Staphylococcal Antitoxin (400 units per ml)—Standard antitoxin was diluted 1/3300 for the control tests

Borate Buffer—All dilutions were made in a buffer solution containing 5 7 g of borax, 8 4 g of boric acid, and 9 9 g of sodium chloride, made up to 1 6 litres with distilled water

Tubes used for Tests—For maternal and cord blood, 2 in by $^{3}/_{8}$ in , and for infant s blood 2 in. by $^{1}/_{4}$ in

Sera to be tested were inactivated by heating for 1 hour at 56°C

Test Cells—5% suspension of washed rabbit red-cells in physiological saline

Method

In a row of six tubes were mixed equal volumes of undiluted serum and the dilutions of toxin described above The tests stood at room temperature for 30 minutes A double volume of test cells was then added to each tube, and the tubes were placed in the water bath at 37°C for an hour, left at room temperature overnight, and examined next morning The end point was taken as the last tube in which no hæmolysis had occurred

The toxin control set up with each batch of tests consisted of six tubes, each containing 0 38 ml. of diluted toxin (1/100) to which were added the following volumes of antitoxin (1/3300) 1 1, 1, 0 92, 0 82, 0 75, and 0 5 ml From this point the control tubes were treated and read in the same way as those in the test

Separate pipettes were used for all the reagents throughout, they were cleaned by rinsing in distilled water, and dried in the electric oven

RESULTS

In table I are presented the antitoxin levels of maternal blood, cord blood, and baby's blood The differences and percentage differences between antitoxin levels of the maternal and cord bloods are also shown, the percentage difference being expressed in terms of the maternal blood level In most cases the cord bloods and infants' bloods gave higher values than their respective maternal bloods This is shown graphically in figs 1 and 2

The findings are summarised in table II The results omitted from this table are those in which the end point

TABLE II—SUMMARY OF FINDINGS

—	No of cases	No of cases where antitoxin level was		
		Lower than maternal	Same as maternal	Higher than maternal
Cord blood (omitting* nos 11 and 13)	54	7 (13%)	7 (13%)	40 (74%)
Infant s blood (omitting* nos 2 10 11 13 25 29 and 9 18 19 20)	46	1 (2 2%)	3 (6 5%)	42 (91 3%)

* Not tested, or result inconclusive

was inconclusive or no test was done, results which were conclusive although no end-point was found are included

Taking the average of the percentage differences shown in table I, the antitoxin level in the cord blood was 63% above that in the mother Considering individual cases, the antitoxin level was at least 50% higher in the cord blood than in the mother's blood in 31 instances, and in 18 of these the difference was 100% or more

DISCUSSION

The transfer of tetanus immunity from mother to child was proved by Debré et al (1930), who showed that the antitoxin was present in the cord blood and infants of immunised mothers From their description of only a few cases it is difficult to form an idea of the respective levels of antitoxin in mother and child In 1932, however, Bryce and Burnet observed that the cord-blood level of staphylococcal hæmolysin was sometimes as much as 100% higher than the maternal level, though at that time they did not appear to attach much significance to these findings

Working with diphtheria antitoxin, Liebling et al (1941) demonstrated the presence of antitoxin in cord blood In their cases the relation between the antitoxin levels in the cord blood and in the maternal blood was variable Though they concluded that in most cases the infant's level equals that of the mother's, they presented 16 cases in which high maternal levels were attained, and of these the cord level was higher than the mother's in 9 cases and equal to it in 5

These findings are interesting in view of the work already cited of Barr et al (1949), who, in their study of diphtheria antitoxin levels in 100 infants, reported that the antitoxin level was higher in the cord than in the maternal blood in 10 out of the 11 cases where both were tested

Our investigation has demonstrated clearly that staphylococcal antitoxin is transmitted from mother to child before birth, and that there is a relationship between the mother's and the infant's antibody level Further, it seems that in most cases the blood of the infant and cord is richer in antibody than the mother's On the average we found the antitoxin level of the cord blood was 63% higher than that of the maternal blood If this proves true of other antibody systems, the results may be related to the unusually high level of gamma globulins reported by Longsworth et al (1945) in cord serum

It seems that any adequate theory of the mechanism of transference of antibodies from mother to fœtus must be able to explain the greater concentration of antibody in the fœtal circulation According to Brambell et al (1948, 1949) the only anatomical route available in the human is via the allantochorionic placenta They showed that antibodies do not pass through the rabbit placenta in spite of the fact that the anatomical barrier in this animal is minimal This view is contrary to that attributed by Liebling and Schmitz (1943) to Grosser (1909) in his extensive anatomical description of placentæ However, on reading Grosser's book we can find no experimental observations on the transmission of antibodies

It is perhaps unwise at this point to speculate too deeply on the mechanism of transmission of antibodies, but it seems possible that the antitoxin molecule is so large that it may be unable to cross the placental barrier intact Further experiments, with other antigen systems have therefore been initiated which it is hoped will clarify this problem

SUMMARY

In 56 deliveries the concentration of staphylococcal anti hæmolysin was estimated in blood samples taken from the mother during labour, from the cut umbilical cord before expulsion of the placenta, and from the infant in the first day of life

The antitoxin levels were found to be higher in the cord blood and infant's blood than in the mother's blood in the great majority of cases

Theories of the transmission of antibodies from mother to fœtus must be capable of explaining this finding

It is a pleasure to thank Miss Mollie Barr, M SC, and Mr A T Glenny, F.R S, without whose advice on technique, and help in providing standardised toxin and antitoxin, the work could not have been done We are also much indebted to Dr H. J Parish and Dr C L Oakley for their valuable information and assistance The material for this investigation was obtained through the coöperation of the obstetricians and pædiatricians and also the labour ward staff of Queen Charlotte s Maternity Hospital

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Preliminary Communication

RAPID DETERMINATION OF BLOOD-SUGAR

A SIMPLE METHOD

WHEN a dilute solution of glucose is heated in the presence of sulphuric acid, a pink colour develops, the intensity of which is proportional to the concentration of glucose [1] On this fact is based a simple method for the accurate and rapid determination of blood sugar, depending not on the reducing property of glucose, as in other methods, but on the dehydration of glucose with the subsequent formation of hydroxymethylfurfural.

Reagents

(1) Trichloro acetic acid (chemically pure) 5 g Silver sulphate (analytically pure) 100 mg Distilled water to make 100 ml Store in an amber bottle

(2) Sulphuric acid (chemically pure), sp gr 1 840 Store in a stoppered bottle

Procedure

(1) Pipette 0 10 ml of blood into 1 90 ml of reagent 1 and mix

(2) Filter through Whatman no 1 filter paper, or centrifuge

(3) Add exactly 1 ml of the filtrate to exactly 3 ml of reagent 2 in a wide test tube—e g, 19 mm × 160 mm — and mix immediately by vigorous shaking

(4) Heat the mixture in boiling water for exactly 6½ minutes, then cool in tap water

(5) Determine the optical density spectrophotometrically at 515 mμ and read the blood sugar level of the sample from a standard curve

Determinations of blood sugar levels in a large number of samples both with this procedure and that of Somogyi [2] gave results which agreed very closely The new method is accurate and simple, and requires only two reagents, which are stable for a long time and can be easily prepared or obtained However, to avoid charring of extraneous material by sulphuric acid, the glassware must be kept meticulously clean

One determination of the blood sugar level can be done by an analyst without special training in about

1 Mendel B Bauch M *Klin Wschr* 1926 5 1329
2 Somogyi, M *J biol Chem* 1945 160 69

10 minutes; since at least 20 determinations can be done by one person in an hour with a minimum of effort, this method seems to be particularly suited for use in clinical laboratories

In cases where accuracy is not the first requirement but where speed is most important, the determination of the colour intensity can be further simplified by using a colour scale instead of the spectrophotometer

Banting and Best Department of Medical Research Banting Institute, University of Toronto, Canada

BRUNO MENDEL M.D

P L HOOGLAND Ph.D

Reviews of Books

Modern Trends in Orthopædics

Editor SIR HARRY PLATT, M.D M.S, F.R.C.S, professor of orthopædic surgery University of Manchester London Butterworth 1950 Pp 497 45s

Sir Harry Platt has collected together the contributions of 13 orthopædic surgeons in this country dealing with subjects in which they have a particular interest and experience. Their views on the present status of the pathology and treatment of the conditions of which they write, and their survey of the evolutionary trends in management of major orthopædic conditions, are of great authority All the essays are good, and some are very good. Some stimulating thinking on paper about fracture problems comes from John Charnley G R Girdlestone reminds us of the basic importance of sound conservative management in surgical tuberculosis, even in face of attractive new operations and chemotherapy, and has a valuable section on the operative treatment of Pott's paraplegia. V H Ellis deals with pyogenic infections of bones and joints, but is perhaps not sufficiently clear on the indications for operation in acute osteomyelitis Rocyn Jones combines the history of congenital dislocation of the hip with a proper emphasis on present-day treatment by gradual abduction, but he does not deal with the problem of anteversion of the femoral neck and its surgical correction, nor does he make the fundamental distinction of Leveuf between subluxation and dislocation as separate entities Bryan McFarland deals with congenital deformities in a typically individual way, but is a little sketchy on talipes equinovarus, not mentioning the Denis Browne method in any detail and perhaps unfortunately giving the impression that the tempo of correction need not be too rapid in the early weeks Norman Capener and Roland Barnes have sound reviews of chronic arthritis and tumours of bone, and from Osmond-Clarke on scoliosis, Forrester-Brown on paralysis, and Lloyd Griffiths on vascular lesions, the reader gets the particular pleasure communicated by those who know and are in love with their subjects. There is also a very full and useful account of spinal injuries by A. N Birkett, and Jackson Burrows ends the volume with a lucid catalogue of the bone dystrophies accompanied by a valuable bibliography The book is a testimonial of the best standards of British orthopædic surgery today, and (apart from some rather obscure radiograms) is beautifully produced

Regional Ileitis

BURRILL B CROHN M.D consulting gastroenterologist, Mount Sinai Hospital, New York. London Staples Press. 1949 Pp 229 30s

A MONOGRAPH on regional ileitis is timely, and this one is masterly Since Dr Crohn and his colleagues described it in 1932, knowledge of the varieties and variations of this disease has greatly extended, and he now surveys the published work and relates it to his experience of 298 cases No new light is thrown on ætiology, but the relation of the disease to tuberculosis and sarcoidosis is fully discussed, and a familial incidence and the possibility of a genetic factor are recognised Morbid histology is based largely on the well known work of Hadfield, published in 1939 Dr Crohn divides his 298 cases into four groups regional ileitis, the ordinary chronic form, 222 cases, acute ileitis, 16 cases, ileojejunitis, 38 cases and combined cases of ileitis with involvement of some section of the large bowel (ileocolitis), 22 cases Each group with its special manifestations is discussed in a separate chapter X ray diagnosis is illustrated by many good films and diagrams. He emphasises the importance of being ready to make a diagnosis on clinical grounds and act upon it, even when X-ray confirmation is lacking Acute ileitis is regarded as an individual phase of regional ileitis, clearing up in 25–50% of cases, and advancing to the chronic form in the rest The treatment of the chronic form is essentially surgical, and he favours ileocolostomy, with exclusion rather than resection In laparotomy for acute ileitis he believes that the appendix should not be removed

The chapters on the difficult combined forms—ileojejunitis and ileocolitis—and their differential diagnoses from the sprue syndrome and ulcerative colitis respectively, are a good summary of present knowledge. His view that ileitis and non-specific ulcerative colitis are if not identical at least of the same family, seems rather far-fetched and has little to support it in the text There is a full list of references and no-one can grumble that British authors have not received their due

Electrocardiography Fundamentals and Clinical Application

LOUIS WOLFF, M.D, consultant in cardiology, Beth Israel Hospital Philadelphia and London W. B Saunders 1950 Pp 187 22s 6d

WITH the expansion of cardiography which has come through the use of new leads and the correlation of the results with the pathological findings, there is now a tendency to attempt a fuller understanding of the recorded patterns on the basis of electrical principles This is the object of Dr Wolff's book, and the method of approach will be welcomed by most of those interested in the subject The principles are clearly set out and are then applied to explain the patterns of bundle-branch block, hypertrophy, and cardiac infarction Finally, records from patients with the various common types of myocardial disease are analysed according to the rules previously stated The book succeeds more than most in giving a rational explanation for many of the abnormal patterns of the cardiogram, and if it sometimes fails to do so, this does not detract from the method employed which only needs to be further pursued The cardiologist should read this book, but the student will benefit by it only if he receives oral instruction on the same lines.

Paralysis Agitans

A Clinical and Genetic Study HENRY MJÖNES, from the psychiatric clinic of Karolinska Institutet, Stockholm. Copenhagen Munksgaard. 1949 Pp 195

WHEN it was first suggested, about 70 years ago, that heredity played some part in the ætiology of paralysis agitans, the demonstration of selected pedigrees showing a familial incidence of the disease was held to be sufficient proof of its hereditary nature The development of both genetics and statistics since then, as well as the advances in medical diagnosis, have brought about great changes in attitude, and a good example of the modern approach to the problem is that of Henry Mjönes in his recent investigation in Sweden From the case-records of neurological, medical, and psychiatric clinics he located some 300 patients for whom the diagnosis of paralysis agitans or Parkinson's disease had been made About a third of these cases were discarded after detailed examination, and his study is based on 194 probands with 162 secondary cases (not all of whom were available for examination) among their relatives. Clinically, he found considerable variability in the symptoms. Tremor was the most common and usually the initial symptom. The age of onset varied from 7 to 81 years, with a mean of 49 ± 1.4 years. Since all of the patients with age of onset less than 20 years belonged to families in which there were also cases with later age of onset, he thinks it unlikely that juvenile paralysis agitans is an independent entity Nor could he find evidence of a special paralysis agitans psychosis The only sex difference found was a slight excess of affected males among the parents of the probands and secondary cases, due perhaps to a lower probability of manifestation in females. The analysis of pedigree

was inconclusive or no test was done, results which were conclusive although no end point was found are included

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charts and determination of mendelian figures, together with an incidence of consanguineous marriages no higher than expected, indicate that the mode of inheritance is, in all probability, autosomal dominance For those readers who wish to analyse the material for themselves, the case histories are given in tabular form in an appendix

Das intrakranielle subdurale Hämatom

HUGO KRAYENBUHL, GAETANO G NOTO Berne Huber 1949 Pp 175 Sw fr 18 50

THIS monograph from the neurosurgical clinic at Zurich sets out the clinical features, diagnosis, and treatment of subdural hæmatoma It is based primarily on a survey of fifty cases of chronic subdural hæmatoma and three cases of acute subdural hæmatoma, which are presented in detail A brief survey of the literature places rather much emphasis on subclassifications of types of "pachymeningitis" Perhaps the most useful sections are those on the various theories of pathogenesis and on diagnostic procedures Unlike most other reports on this subject, this draws attention to the value of electro encephalography in the differential diagnosis While neurosurgeons will discover few novelties here, and may perhaps find the case-histories rather tedious, it is nevertheless a useful survey of a subject that still awaits precise and comprehensive exposition.

Practice of Urology

HARRY C ROLNICK, M.D, professor of urology, Chicago Medical School Philadelphia and London J B Lippincott 1950 In two volumes Pp 1297 £9 9s the set

THIS is one of the most up-to-date and readable textbooks on the subject in the English language Many of the excellent illustrations have already appeared in the popular treatise written by Professor Rolnick in conjunction with the late Dr D N Eisendrath, and those in the section on operative technique are well worth republishing One could, however, wish for rather better cystoscopic plates The work is singularly complete and mirrors well the modern American urological viewpoint In addition it gives the ideas of the author, so that a balanced opinion can be formed of his practice—a feature which makes the book more useful to the younger specialist than a corresponding work by many authors It is regrettable that little note has been taken of recent European advances, apart from Millin's developments in the field of retropubic surgery We look in vain for any mention of the work of Denis Browne or McIndoe on hypospadias, of the Ombredanne technique in orchidopexy, of Wilson Hey's contribution to prostatic surgery, of the adaptation by Couvelaire of Marion's trocarisation technique for dealing with urethrovesicovaginal fistulæ, of the Hamilton Stewart operation for certain cases of hydronephrosis, or of recent British progress in the relief of stress incontinence of urine in women As is common in American accounts, the names of foreign workers, when mentioned, are often incorrectly spelt—surely "Czerny" need not be "Cherney" Typographical errors abound, some not without humour one figure, depicting varieties of bladder distension, has the caption "causes of pregnancy" Nevertheless, we can most heartily recommend this work, and only wish that the cost did not preclude its purchase by many of the younger surgeons

Muskelpharmakologie

Und ihre Anwendung in der Therapie der Muskelkrankheiten OTTO RIESSER, professor of pharmacology, Frankfort-on Main Berne Huber 1950 Pp 232 Sw fr 16 80

THE contents of this book—which is to form part of Lieferung VI of Prof T Gordonoff's *Handbuch der Therapie*—are well described by its title, and Professor Riesser, who has been contributing to the subject since 1916, is well qualified to write it He deals in the opening chapter with the physiological principles, histology, and physical and electrical phenomena of muscle, and in the main part of the book with the pharmacology of the skeletal muscles This includes their stimulation by acetylcholine, the actions of choline-esterase and its inhibitors—potassium, curare guanidine, adrenaline, and other drugs Short chapters follow on tone and the enzyme substrate relationships of myosine and adenosine triphosphate A chapter on the metabolism of the muscle includes a very brief survey of the breakdown of carbohydrate The last chapter is devoted to the therapeutic aspects, but there is curiously little about curare considering how much it has been discussed in recent Anglo-American literature, and this part of the book is not likely to be of great value to British readers The bibliography is good but incomplete Some 83 well-printed diagrams, mostly of drum-tracings, illustrate the pharmacological actions of the various drugs which are being described The work as a whole is probably a worthy *Baustein* in Gordonoff's main edifice, but it is pre-war rather than post-war, and Continental rather than English, in approach This may be a good thing, but the reader should be prepared for it

Acute Appendicitis

FREDERICK FITZHERBERT BOYCE, M.D, assistant professor of clinical surgery, Tulane University of Louisiana School of Medicine New York and London Oxford University Press 1949 Pp 487 70s

THIS volume is recommended to anybody who wants to know what has been written about acute appendicitis. The author seems to have reviewed all the really significant articles, but it is not always easy to extract information from the book For instance, the facts about conservative treatment have to be tracked down in three widely separated sections, and even then we are not quite sure of the author's personal views and experience One strange omission is the method of proctoclysis This excellent procedure for introducing fluid, which was ardently advocated by the great J B Murphy, seems to have been discarded by most American surgeons It is good to see a small incision advocated (though the surgeon must be ready to enlarge it if necessary), but among the incisions mentioned we do not find the oblique incision straight through all the muscles in the right iliac fossa—one which has distinct advantages in certain circumstances The instructions for dealing with an appendix abscess are extraordinary. The surgeon is told to examine the abdomen under the anæsthetic to determine the point of maximum fluctuation and to make the incision over it, Dr Boyce says that there is never any excuse for invading the peritoneal cavity in draining a fully localised appendiceal abscess walled off by adhesions, and the proposal is made that a sterile light should be introduced to make sure that all secondary loculations are opened up

Apart from the practical side, there is much of interest in this book The information is up to date, and the number of references is enormous

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Campbell's Operative Orthopædics (2nd ed London, Henry Kimpton 1949 Pp 1643 2 vols £7 10s)—This great orthopædic textbook, appearing in its second edition after ten years, shows clearly that the experience and wisdom of the late W C Campbell have not been lost, but have been handed down to his editors, J S Speed and Hugh Smith, and their colleagues, to whom the revision must have been a labour of love Much of the text remains unchanged, and only minor alterations in arrangement have been made, but many orthopædic advances which were novel or experimental in the first volume have now become routine practice and considered opinions are given of their merits while newer methods, such as cup arthroplasty, intramedullary nailing trochanteric nailing and disc surgery, are well described by various writers Though encyclopædic in scope, the work is not in the main overloaded The writer of the good chapters on amputations in a few words relegates to the junk room many of the obsolete operations so often slavishly described, but includes many other novel and ingenious amputations, either because they may be good in themselves or because they may stimulate further advances A standard below knee and a standard above knee amputation, to which we in this country seem to becoming regimented, do not seem to be gaining ground in America. Nearly all the original illustrations remain, supplemented by many new diagrams and X ray photographs

produced by oxygen-enriched air, but unfortunately it is still impossible to estimate plasma oxygen levels directly—they can only be calculated GRAHAM et al [5] think that the infants are mainly suffering from a defect in oxygen exchange from blood to tissues

Providentially, newborn mammals can survive anoxia much longer than they can later, and the less mature they are at birth the longer their survival time The two main reasons for this are their low cerebral metabolic rate and their faculty of anaerobic metabolism which is characteristic of fœtal life and persists for a short time after birth The fœtus and newborn use less oxygen per unit of energy than older mammals do, because their metabolism has an end point in carbohydrate breakdown short of carbon dioxide and water [4] Nevertheless, those who suffer from prolonged anoxia may sustain permanent tissue damage if they survive The central nervous system is the most vulnerable part of the body to anoxia, and its vital processes cannot withstand oxygen lack for longer than five or six minutes without harm The mechanism of the pathological changes produced is a complex one, involving functional, metabolic, and structural factors, and capillary hæmorrhage may also become serious in some situations A considerable proportion of cases of cerebral palsy, personality disorder, and mental defect are now thought to be sequelæ of fœtal or neonatal anoxia For the great majority, however, nature has provided adequate safeguards against this hazard of birth

Trends in Tuberculosis

A GRAPH of the mortality from tuberculosis for the past century is agreeable to contemplate, so steady has been the decline, but does it give an accurate picture of what is going on? Dr HERBERT R EDWARDS and Mr GODIAS J DROLET [7] think it time we turned our eyes from the cemeteries and premature graves and considered the living tuberculous, for, unless the incidence of new cases is also falling, we cannot regard the disease as under control They say that between 1940 and 1947, though the tuberculosis death-rate in the United States fell from 45 8 to 33 5 per 100,000 population, the number of new cases registered (the morbidity-rate) rose from 76 4 to 93 3 per 100,000 Some of this rise is of course due to better ascertainment—especially of early cases—by mass radiography, but it cannot all be explained in this way Thus in New York in 1947 mass radiography accounted for only 3 4% of the new cases registered, whereas 66% were in the second or third stage and diagnosed by other methods In Los Angeles in 1948 nearly 87% of cases were already "advanced" when notified [8] Admittedly the morbidity-rate is no direct measure of the amount of tuberculosis in a community, for tuberculosis is a long disease, and the yearly increment of new cases merely swells an existing tuberculous population of uncertain dimensions But the fact that the morbidity rate is rising suggests that this population may be growing, despite the benefits of modern treatment

In our own country the picture is similar though not identical In England and Wales, the death-rate from pulmonary tuberculosis fell from 56 per 100,000 population in 1940 to 44 in 1948, but the morbidity-rate rose from 111 to 121 Actually the notification-rate is not a very satisfactory figure to go by, because not all the cases notified prove to have the disease, but we also know that the number of cases on the dispensary registers has risen almost steadily, from 188,752 in 1939 to 271,552 in 1949 (These totals may be swollen by some recovered cases whose names have accidentally been left on the registers, but *relatively* they are comparable, and a rise of over 80,000 can hardly be without significance) During the past eight or ten years, then, here as in America, the mortality-rate has been declining but the incidence of new infections apparently has not In both countries the cases under treatment have increased, the sanatorium waiting lists are lengthening, poor housing and overcrowding are helping the spread of infection, and the pool of active cases in the community is almost certainly growing larger The falling death-rate may, in fact, be misleading, for, though it must depend partly on modern methods of treatment, it also partly is a legacy from the days, 15 or 20 years ago, when beds and nurses were better matched to the number of patients, and when on the whole there was probably less overcrowding of houses In another 15 and 20 years' time we may possibly pay with a rising death-rate for our present failure to control infection

To cope with the new cases clinics are working harder than ever before In New York, field visits paid by health department nurses to patients or their families in their homes fell by a third between 1945 and 1948, largely because the clinic staffs were so busy that less time could be spared for visiting The New York Tuberculosis Association comment that "it is impossible to avoid thinking of a possible link between this reduced amount of home supervision and the spread and increase of tuberculosis in New York City in the past few years" The load on our own clinics is hard to estimate accurately Their number has not increased greatly to meet the growing demands on them there were 471 in England in 1938, and 492 in 1947 Graphs made at a typical clinic show that, between 1939 and 1949, the number of patients systematically examined by the physician nearly doubled, and so did the total attendances, while X ray examinations became more than six times as numerous, and refill attendances of patients with artificial pneumothorax rose from 877 to 3024 The clinics in fact are doing a great deal of work which was formerly done by the sanatoria, and their routine work will become even heavier if BCG is used on a wide scale All this means that there is less opportunity for home visiting or follow up

Weaknesses in our tuberculosis scheme have always been evident In the days before the war, standards in different areas varied with the keenness of the local authorities and the amount of money at their disposal In some areas the care offered was first-rate, in others it was very poor The National Health Service Act, by reducing financial differences, has removed some of this inequality, but it has not, of course, been able to create staff, conjure up new hospital buildings, or solve the country's housing

7 *Amer Rev Tuberc* 1950 61 39
8 Tuberculosis Reference Statistical Year Book 1948 New York Tuberculosis and Health Association 1949

of oxygen utilisation with exceptional reduction of oxyhæmoglobin, and the increased placental blood-flow In the human fœtus conditions are similar, and various adverse circumstances may precipitate a serious oxygen want BARCROFT[1] divided anoxia into anoxic, anæmic, and stagnant types, according to whether the defect lies in the oxygenation, oxygen transporting mechanism, or capillary circulation of the blood Fœtal anoxia is almost invariably of the anoxic type and usually originates outside the body of the fœtus The two main causes are reduction in the oxygen tension of the maternal blood and interference with the passage of oxygen from mother to fœtus The mother's oxygen tension may be reduced by asphyxiating anæsthetics, notably nitrous oxide, by any factors that lower her blood pressure, such as spinal and caudal anæsthesia, or by systemic diseases such as the anæmias, heart-failure, and pneumonia The transfer of oxygen from mother to fœtus may be interrupted by the tetanic uterine contractions which pituitary extract sometimes produces, by separation or infarction of the placenta, or by prolapse or knotting of the umbilical cord

The laudable quest for painless childbirth has increased the incidence of serious fœtal and neonatal anoxia, since all the known analgesic, sedative, and general anæsthetic drugs, if given to the mother, will affect the central nervous system of the fœtus EASTMAN,[2] a leading authority on fœtal anoxia, showed that gas and-oxygen containing not more than 85% of nitrous oxide can be administered to the mother for periods of under three minutes without endangering the fœtus, but that giving a mixture containing over 90% of nitrous oxide for longer than three minutes will cause severe fœtal anoxia in a third of the cases The neonatal apnœa associated with nitrous oxide is an anoxic rather than a narcotic effect When ether is given in childbirth it does not cause any anoxia, but its narcotic action often delays the onset of the infant's respiration as long as the anoxia of nitrous oxide Before delivery the concentration of ether is similar on the two sides of the placental membrane, but thanks to the high volatility of ether it is rapidly excreted by the infant's lungs, more than half being eliminated from the circulation within three minutes of birth In the last decade cyclopropane has been increasingly used in obstetrics for maintaining anæsthesia after thiopentone induction, it is usually given in a concentration of 5% with 95% oxygen, and this will not significantly depress the oxygen tension of either the maternal or fœtal blood However, like ether, cyclopropane diffuses readily through the placenta and it has the same potentiality for narcotising the fœtus, LUND[3] takes the view that it is therefore not completely safe for the fœtus Curare, which is often given with cyclopropane to ensure good muscular relaxation, apparently does not pass the placenta, for it does not affect the neuromuscular end plates of the fœtus Trichlorethylene is now much used for self-administration by the mother during pains, it is a more effective analgesic than nitrous oxide, and intermittent administration precludes appreciable fœtal damage in either case Thiopentone is the most popular intravenous anæsthetic in current obstetric practice It acts very rapidly and is also rapidly transferred across the placenta Induction should therefore be delayed until the last moment and the delivery performed as expeditiously as possible, even so some depression of the fœtal respiratory centre is unavoidable It is clear then that the ideal obstetrical analgesic has yet to be discovered, and, as LUND says, choice of drugs is less important than skill in using them

The inception of pulmonary respiration at birth is a remarkable and dramatic event Normally the sensitivity of the brain to respiratory stimuli is unimpaired by birth processes such as the transient anoxia associated with uterine contractions, and the many sensory stimuli that arise directly after birth start the baby breathing straight away at the controlled rhythmic level But in cases of respiratory depression, whether from anoxia, narcotics, anæsthesia, hæmorrhage, or œdema, respiration begins quite differently, in gasps A gasp is a forced inspiration involving much of the musculature of the body, it is the most primitive respiratory movement, the first to appear in the developing fœtus, and it has a purely medullary mechanism The respiratory inhibitors, such as anoxia and anæsthetics, inhibit the brain centres from above downwards, and when only the medullary centres are functioning the gasp is the only possible respiratory response to any stimulus After a pause the baby gives another gasp, followed by others, and so it gradually secures enough oxygen to bring into action the higher parts of the brain which will establish a respiratory rhythm If the gasps do not achieve this result they diminish in frequency and intensity and the baby dies The manner of onset of respiration is a valuable index of the state of the central nervous system, it should therefore be more closely observed and carefully recorded, for it may provide valuable evidence in the future, particularly in cases of cerebral palsy and mental defect The alternating hyperpnœa and apnœa commonly seen in premature infants is a characteristic of "mountain sickness" and gives place to regular respirations in an oxygen enriched atmosphere[4] Premature infants with periodic respiration should therefore be given oxygen, though we do not yet know the exact mechanism of the periodicity or how the oxygen stimulates regular respiration GRAHAM and colleagues[5] found that the average arterial oxygen saturation in a group of premature infants was 93% in atmospheric air (adult controls 94%) and 100% when they were breathing 70–80% oxygen, thus, optimal function of the respiratory centre, as shown by regular breathing, was not attained until an oxygen enriched atmosphere forced the arterial saturation to almost 100% and presumably greatly increased the amount of oxygen dissolved in the plasma In view of the essentially normal hæmoglobin saturation in these premature infants, WILSON[6] believes that physically dissolved oxygen must play a large part in the effects

1 Barcroft J *Lancet* 1920 ii 485
2 Eastman N J *Amer J Obstet Gynec* 1936 31 563 *Amer J Dis Child* 1948 76 661
3 Lund C J *Amer J Obstet Gynec* 1942 43 365
4 Wilson J L Reardon H S Murayama M *Pediatrics* 1948 1 581
5 Graham B D Reardon H S Wilson J L Teao M U Baumann M L *Amer J Dis Child* 1950 79 371
6 Wilson J L *Ibid* p 376

health and health visitors—were not professional interviewers, but were trained in the subjects under investigation

It is important to realise the limitations of sample survey investigations They are unlikely to explain etiology, and they can seldom achieve exact diagnosis But they may yield new light on old problems, which can be followed up in the laboratory or clinic Above all, they can tell us where and whether human needs are being met, and how the new galaxy of social services is operating at the receiving end The sample survey should be the administrator's intelligence service, as essential to his operations as are the X ray film and the blood count to the surgeon's As P E P says, "Despite the rapid enlargement of the health services, no adequate machine has yet been set up to discover what return is being made for the skill and money expended Many of the services are experimental, and there is need for a rapid and objective measure of their success Such a measure could well be supplied by sample survey techniques"

THE LISTER INSTITUTE

RESEARCH WORKERS and clinicians have cause to be grateful for the solid, though often unobtrusive, achievements of the Lister Institute, and the latest annual report[1] shows that the volume of useful work is still as great as in former years In the bacteriology division studies which are now in progress include one into the possible relation between "iso allergic encephalitis" and postexanthematous encephalitis, with special reference to postvaccinal encephalitis Groups of guineapigs have been sensitised in various ways with emulsions of both heterologous and homologous cerebral white matter, with and without adjuvants A few of these animals have developed paralytic symptoms, and the histology of their central nervous systems is being examined After an interval to exclude the occurrence of further cases of paralysis due to the sensitisation alone these animals will be infected with vaccinia virus adapted to the guineapig and watched for the development of any abnormal symptoms Another group of workers has been engaged in preparatory experiments for investigating the fate of dextran in the body after injection An accurate method of determining dextran in rabbit urine has been worked out, and pilot experiments on the effect of controlled acetone fractionation and hydrolysis on the molecular size of dextran in relation to renal excretion have been performed Similar experiments on the effect of dextran of different molecular sizes on the histological structure of various tissues are in progress In the biochemistry division, the gene product responsible for the recently discovered human blood group "Lewis" has been obtained in essentially homogeneous condition Last year it was reported that "Lewis" positive adults are "non secretors" within the ABO classification, but the observation that "Lewis" positive persons secrete a specific water soluble gene product shows that there are in fact no "non-secretors," all persons secreting one or more of their blood group factors in a water soluble form It is now postulated that the "Lewis" genes and the genes of secretion probably belong to one genetical system

The Medical Research Council's bacterial chemistry unit has now been transferred to the National Institute of Medical Research at Mill Hill, and the National Collection of Type Cultures to the Central Public Health Laboratory at Colindale The blood products unit, the blood group research unit, and the blood group reference laboratory are still accommodated at the institute The blood products unit has continued to produce dried human plasma and plasma fractions for the Ministry of Health Half of each batch of gamma globulin has been concentrated by drying from the frozen state in bulk, reconstituted in smaller volume, bottled to give 250 mg per ampoule, and held as a liquid The other half has been ampoulled before drying in the ordinary way, in quantities containing 250 mg The relative potency of material prepared in these two ways is to be tested clinically by the Public Health Laboratory Service

1 The Lister Institute of Preventive Medicine Chelsea Bridge Road London S W 1 Report of the Governing Body 1950

BONE METABOLISM

BEFORE the days of the microscope John Hunter predicted a mechanism for removal by absorbents of those portions of a bone which needed reshaping in the process of growth The histological mechanism subsequently discovered was resorption of bone by osteoclasts, with apposition of new bone, first as a thin seam of osteoid tissue, by osteoblasts This osteoclastic resorption and osteoblastic apposition goes on throughout life and corresponds in biochemistry to the calcium balance Professor Albright[1] came into the story in 1925 when the parathyroid hormone was discovered Working with J C Aub he was able to show that repeated injections of the parathyroid hormone in normal man raised the blood calcium and stimulated excessive osteoclastic resorption, throwing the patient into a negative calcium balance There are still some who maintain that the bedside clinician cannot grasp enough elementary biochemistry to understand this, but like most true discoveries in science it is simple What was laid down by Aub and his students in 1925 in the Massachusetts General Hospital led all over the world to the diagnosis, on the clinical, biochemical, and radiological evidence, of cases of hyperfunction of a parathyroid tumour—in other words hyperparathyroidism Numerous sufferers from what had been an incurable skeletal disease, the generalised osteitis fibrosa of von Recklinghausen, were cured by surgeons who explored the neck and removed what they could not feel because it was tucked away behind the thyroid gland—a parathyroid tumour

All this work threw emphasis upon another gross skeletal disease brought about by excessive osteoclastic resorption—namely multifocal osteitis fibrosa, known in the United States as polyostotic fibrous dysplasia of bones In this disease there is no evidence of metabolic disorder, both the blood chemistry and the calcium balance are normal, and exploration of the neck for a parathyroid tumour is wholly unjustified Careful radiological studies show that the bone shadows are normal in between the foci of disease, X rays, therefore, emphasise that the condition is not a generalised skeletal disease Endocrine glands other than the parathyroids influence the state of calcification of the skeleton, for example, osteoporosis is often present in long-standing cases of hyperthyroidism, and osteoporosis chiefly affecting the spine is a characteristic feature of Cushing's syndrome Albright's work adduces convincing evidence that the spinal osteoporosis of elderly women is also the result of an endocrine imbalance There is a considerable body of experimental evidence that œstrogens influence bone formation In female pigeons there is a considerable rise in the serum calcium level before ovulation, with reversion to normal after ovulation Albright investigated the effect of œstradiol benzoate on the calcium and phosphorus metabolism in women suffering from postmenopausal osteoporosis He demonstrated that this œstrogen promotes a considerable retention of calcium and phosphorus, through a reduction of both the fæcal and urinary excretion

1 The Parathyroid Glands and Metabolic Bone Disease By FULLER ALBRIGHT M D associate professor of medicine Harvard Medical School Boston Mass EDWARD C REIFENSTEIN jun M.D consultant in charge of the department of clinical investigation Sloan Kettering Institute of Cancer Research London Baillière Tindall & Cox. 1948 Pp 393 61s 6d

problem Moreover, as Dr F HALL puts it in the June issue of the *N A P T Bulletin*, it has produced "a state of administrative divorcement between the curative and preventive branches of medicine" Dr W L BURGESS points out that the local health authority is handicapped in preventive work by the loss of the dispensaries, which now come under the hospital authorities There is a danger that the dispensaries, formerly the very centres of preventive education and aftercare, may become purely clinical institutions or outpatient departments Undoubtedly the service might gain much if advisory committees were established to integrate the tuberculosis work of each region At present, as Dr F A H SIMMONDS says, we are "fighting with two armies who not only have no unified command, but have no joint plan for the common task" What has been gained on the hospital side (and thanks to advances in thoracic surgery, and the better deployment of thoracic surgeons, this has been much) is offset by a decline on the preventive side Moreover, the economic position of patients, though in theory as good as it was before, now requires an unpopular appeal to the Assistance Board

Some means of limiting the spread of infection more effectually are already being tried Domiciliary treatment, used in conjunction with hospital care, has already enabled many patients to become sputum-negative—and therefore safe companions for their families—within a few weeks or months of diagnosis But this does not mean that domiciliary care is the ideal treatment for every patient, or even for most, and it should be regarded mainly as an expedient capable of helping us through a difficult phase A second measure now widely recognised as necessary is that the general and teaching hospitals should reserve a proportion of their beds for tuberculous cases This could at one stroke provide beds for all early cases, and would have the additional advantage of making all student nurses and future doctors familiar with a widespread disease of which they are nowadays too often ignorant The difficulty that some of the nurses in these hospitals may object to looking after patients diagnosed as tuberculous can be overcome—as Dr HORACE JOULES is showing at the Central Middlesex Hospital—when proper precautions are taken for the care of their health In this hospital all patients in the general wards who are suspected of tuberculosis are transferred at once to a tuberculosis unit in a separate building, and only Mantoux positive nurses are allowed to look after them The health of all the nurses is carefully supervised, and the incidence of tuberculosis among them is lower than in any of the hospitals studied in the Prophit investigation[9] indeed Dr JOULES hopes to be able to show in a year or so that it is no higher than the incidence of tuberculosis in young women of the same age group in the general population He warns all prospective students and their parents that they will be expected to nurse tuberculous patients, and he has never had a refusal As the care of the nurses could perfectly well be of this standard in all hospitals, there seems to be no adequate reason why those who control our hospital resources should go on denying tuberculosis the larger share it so clearly deserves As a rule we are rightly anxious to treat quickly the patient whose life is threatened, even though the chances of cure may be small and the risk is to the patient alone Yet we turn a curiously blind eye to the tuberculous, whose life may be threatened as gravely, whose chances of cure are often good, and whose infection, untreated, will spread and spread and spread

9 Tuberculosis in Young Adults Prophit Report 1935–44 London 1945

Annotations

SAMPLE SURVEYS

THE sample survey as a tool in medicosocial research has come to stay, and P E P has done a thoroughly useful job in issuing two broadsheets[1] describing in fair detail the present position, both as to techniques and organisations in the field The essence of the sample survey differs in no essential from the familiar technique of the blood count In each, a tiny fraction only of the whole is examined, and from this deductions about the whole are made In each, a measurement is made while the vast multitude to whom it applies, whether human or cellular, swirls by unaware that it has been measured The process of sampling, though to the outsider the most fallible part of the job, is in fact the least chancy of all the stages, since, provided well authenticated rules are followed, the precise margin of error is known The analysis of results, using the punched or clipped card technique, can also be rendered entirely automatic, though special precautions are necessary since the high speeds of work tend greatly to magnify human error

The key to successful sample survey work lies in the design of the questionary and the conduct of the interview A careful pilot inquiry, using the free interview method, is a usual first step in any new field of investigation, for nothing is harder than to judge, in vacuo as it were, what questions a sample of the public can or cannot answer Inability to answer relates mainly to memory or lack of experience For example, it is of little use to find out what people think of heating or lighting methods of which they have had no personal experience, or products which they have never tried On the other hand, it seems that when faced with an investigator, questionary in hand, the large majority of people tell the truth In most situations, the Law of Least Energy operates that is to say, it is easier to speak the truth than to make up a lie Where social prestige operates, this does not apply For example, the question, "Do you go to church regularly?" invariably produces an inflated answer To get at the true facts, all mention of church can be excluded from the questions, every alternative Sunday occupation is checked over, and then the crucial question is popped "And did you do anything else?"

In the medicosocial field, the Government Social Survey, now a permanent institution, has been making history since 1945 with its monthly Health Index for the Registrar General At present Britain is the only country in the world to collect a complete picture of national morbidity, though the United States intends shortly to follow our example Ad hoc medicosocial sample surveys include such notable efforts as the maternity services investigation made by the Royal College of Obstetricians and Gynaecologists and the Population Investigation Committee This was in fact a census of all women giving birth to children in a single week in March, 1946 Its success (13,687 women cooperating out of 15 130) was due to the efforts of nearly all the local health authorities in the country The investigators—medical officers of

1 *Planning* May 15 and June 5 1950 From Political and Economic Planning 16 Queen Anne's Gate London S W 1

Special Articles

THE COST OF THE HOSPITAL SERVICE IN A TEACHING HOSPITAL

A GILL
A.H.A., F.I.A.C
TREASURER, UNITED OXFORD HOSPITALS

D M LIVOCK
A.C.A

BEFORE the introduction of the National Health Service it was customary for the voluntary hospitals to issue annual reports containing details of their finances and statistics for the year ending Dec 31 These reports appeared between April and September Tables based on them were then compiled and published in the statistical summary of King Edward's Hospital Fund for London and the *Hospital Year Books* of the British Hospitals Association It was thus possible for anyone interested in hospital economics to form some idea of the trend of hospital costs and of how hospital services were being used The report of the Comptroller and Auditor General on the accounts of hospitals and executive councils for the first nine months of the health service has now been published [1] But this does not give any analysis of the cost of individual hospitals, and in view of the increases in the estimates for the health service it may be of interest to examine the cost accounts of one hospital, the Radcliffe Infirmary, Oxford, for the period July 5, 1948, to March 31, 1949, and to compare them with an almost similar period immediately preceding the appointed day—i e, Oct 1, 1947, to July 4, 1948

TABLE I—ANALYSIS OF OUTPATIENT ATTENDANCES AND COST

—	Oct 1 1947 to July 4, 1948	July 5 1948 to March 31 1949
New outpatients	26,737	34,355
Outpatient attendances	141 874	145 725
Total cost	£48,215	£64 376
Average cost of each outpatient attendance	6s 10d	8s 10d
Average cost of each outpatient	£1 16s 1d	£1 17s 6d
Analysis of cost of each outpatient		
Cost of outpatient department	£1 2s 4d	£1 6s 0d
Cost of special services	13s 9d	11s 6d
	£1 16s 1d	£1 17s 6d

TABLE II—AVERAGE COST PER INPATIENT WEEK OF MEDICAL BEDS

—	Oct. 1 1947, to July 4 1948	July 5 1948 to March 31, 1949
	£ s d	£ s d
Provisions	1 4 11	1 13 2
Surgery and dispensary	13 4	15 1
Domestic	1 6 9	1 6 3
Salaries and wages Medical	4 2 10	2 7 11
Nursing		1 17 8
Other officers		3 2 3
Miscellaneous	8 11	7 3
Establishment	7 11	16 6
Finance	1 11	1 9
	£8 6 7	£12 7 10
Physiotherapy	1 1	1 7
X ray	8 2	12 4
Laboratories	1 0 7	1 2 10
Theatres	4 1	4 9
Occupational Therapy	—	1 8
	£10 0 6	£14 11 0
Average occupation	82%	85%

In 1937, three wards at the Radcliffe Infirmary were allocated for the use of the newly appointed Nuffield professors of medicine, surgery, and obstetrics and gynæcology, and it was agreed that the cost of certain patients should be borne by the research funds of the Nuffield Committee for the Advancement of Medicine To find out what these patients cost, a departmental costing system was instituted by which the total expenditure of the hospital was allocated to individual wards and to outpatients Details are thus available of the cost of each ward and department of the hospital and of the services they render The system has now been extended to cover the other hospitals within the United Oxford Hospitals group A general increase in costs since July 5, 1948, is shown, but it should be pointed out that all known increases in salaries, including those of medical and dental staff under the N H S, are taken into account

From table I it will be seen that, in the nine months after the National Health Service started, the number of new outpatients was 28 6% higher than in the previous nine months, while the corresponding rise in the number of attendances was only 2 7% This could imply that increased efficiency in the department reduced the need for attendances On the other hand, it might mean that a greater proportion of the patients were referred to the department for less acute conditions

Figures are available which show the average weekly cost of inpatients in medical, surgical, E N T, maternity, and private wards, and also in the research beds for neurosurgery, gynæcology, and medicine Tables II and III show the costs in the medical and the surgical wards during the nine months before and after July 5, 1948

TABLE III—AVERAGE COST PER INPATIENT WEEK OF SURGICAL BEDS

—	Oct 1 1947 to July 4, 1948	July 5 1948, to March 31 1949
	£ s d	£ s d
Provisions	1 3 10	1 9 1
Surgery and dispensary	12 2	14 10
Domestic	1 6 4	1 5 3
Salaries and wages Medical	3 12 8	1 19 8
Nursing		1 16 6
Other officers		2 17 5
Miscellaneous	8 3	6 8
Establishment	8 1	10 10
Finance	1 9	1 7
	£7 13 1	£11 1 10
Physiotherapy	2 9	4 3
X ray	6 10	8 5
Laboratories	9 9	11 5
Theatres	1 13 9	2 13 11
Occupational therapy	—	8
	£10 6 2	£15 0 6
Average occupation	84%	93%

As one would expect, the cost of a surgical bed is higher than that of a medical one, for it carries a greater share of the theatre costs

The percentage increase is 45 for medical beds and 46 for surgical beds The period is too short to allow of generalisation, but it is evident that if allowance is made for the increases in the salary scales of medical and hospital staff, the introduction of the health service did not cause a phenomenal rise in costs

TABLE IV—ANALYSIS OF TREATMENT AND COST OF INPATIENTS

—	Oct. 1 1947 to July 4 1948	July 5 1948 to March 31 1949
New inpatients treated	9260	9113
Inpatient days	121 922	122 666
Average daily inpatients	444	454
Average stay in days	13 2	13 5
Cost per inpatient	£19 11s 9d	£30 1s 2d
Cost per inpatient week	£10 8s 3d	£15 12s 6d
Total expenditure	£181 361	£273 937

1 See *Lancet*, 1950 I, 681

Œstrogen therapy also lessened or eliminated the pain in the bones and produced general constitutional improvement Albright concluded that bone formation is influenced by certain of the steroidal hormones According to his hypothesis the steroidal hormones, promoting anabolism of protein, stimulate the osteoblasts, while the "sugar active" corticoids of the adrenal cortex, which inhibit protein anabolism, depress the activity of the osteoblasts At the time of the menopause the laying down of organic matrix fails to keep pace with bone resorption and a reduction in bone substance results

THE NUFFIELD FOUNDATION

THE Nuffield Foundation was brought into being for the purposes of promoting health, social well-being, and the care and comfort of the aged poor The trustees might thus have diffused the funds over a vast field of constructive endeavour Instead, they wisely chose to concentrate them where the need was keenest, and the report for the past year [1]—the first of the Foundation's second quinquennium—shows that this policy remains unchanged In curative medicine, substantial grants have been promised for investigations of the modes of action and methods of synthesising 'Cortisone' and allied substances and earlier projects in the fields of medicine (including social medicine), the natural sciences, and the social sciences are promised further support In its second five years the Foundation is concentrating particularly on fundamental research, notably in biology and sociology In biology new grants have been made for studies of the factor determining the difference between cell types, of various types of learning system, of the control of regional determination in embryos and of the migration of cells in embryos and in adult life, of X-ray analyses of crystals, and of tissue culture In sociology grants are being made for investigations of the costs of founding and raising a family, of the patterns of family life, of the techniques of social surveys, and of the progress of 2000 Scottish 11 year olds, in the whole range of intelligence, who were first tested in 1947 By its fellowships and scholarships the Foundation has already done much to bring together teachers and others in the Commonwealth who might otherwise never have met, and it is now prepared to take a more direct hand in Commonwealth affairs by grants for research in overseas universities and similar institutions (A Nuffield research professorship of mechanical engineering has already been endowed in New South Wales) The Foundation now discharges its obligation to the aged through the National Corporation for the Care of Old People, but the report speaks pertinently of one aspect which is becoming more important

> "The increasing infirmity which often accompanies increasing age is a problem which every home for the able bodied—whether run by local authorities or by a voluntary society—has to face eventually, for, however spry the residents may be when admitted, some of them will decline into progressive ill health and will need much more physical help and more continuous care than a lightly staffed home can easily provide At present it is nearly always impossible to gain admittance for a case of this kind into hospital Indeed there is a real danger that in a few years from now many of the homes recently established may degenerate wholesale into medical slums unless some simple and smooth transition can be effected to a stage half way between the two types of care provided respectively by the welfare and the health authorities"

Every project, says the report, is measured against its presumed or even its speculative, contribution to the practical betterment of life Perhaps the Foundation's most notable achievement has been to further rational humanitarianism

1 The Nuffield Foundation Fifth Report Published by the foundation 12–13 Mecklenburgh Square London W C 1

HUMAN PERFORMANCE

OWING partly to war-time research, we are now fairly well placed to assess capacity for work and the causes of failing performance During the late war Dr N H Mackworth conducted extensive studies of performance in a wide variety of tasks, and his findings now published,[1] will be of interest far outside the confines of the psychological laboratory Indeed he provides good evidence for the claim that "it has now become perfectly possible for experimental psychology to give assured and practical answers to questions concerning the limiting conditions under which even complex human operations can be maintained at a high level of accuracy with the minimum strain"

Dr Mackworth's studies, directed to the solution of problems arising in the extremely practical circumstances of armed conflict, owed much, as he points out, to the inventiveness and theoretical brilliance of K J W Craik, whose influence on the present generation of experimental psychologists has been profound The investigations fall into two main groups, concerned with (1) vigilance, and (2) the effects of environmental stress In the work on vigilance the situations which, under Service conditions, had produced the problems were imitated closely in the laboratory Two visual tasks were studied in connection with the difficulties found in 1943 in the routine use of radar, and auditory vigilance was studied in a third task simulating the operation of an 'Asdic' apparatus In all three tasks significant deterioration, as measured by the number of signals missed, was found during a two hour watch, beginning before the end of the first half hour This deterioration was related to the difficulty of the task and the competence of the operator, for it did not take place when the initial level of missed signals was low It could be prevented for the full two hour period by methods which kept alive the operator's interest—for instance, interruption of the task by the experimenter, or supplying knowledge of results—or by amphetamine sulphate in 10 mg doses Dr Mackworth interprets these findings in terms of Pavlovian conditioning The researches on environmental stress deal with the effects of harassing gases and of high atmospheric temperatures Measurements were again made in several types of performance analogous to those required in the Services. An interesting finding was that deterioration in intensive forms of work was related logarithmically to increase of temperature Physiological indices proved unreliable, except when the physiological state directly responsible for the deterioration could be identified

The experiments are clearly described and should be readily capable of repetition and extension The techniques are of a kind which ought to be of equal value in dealing with the problems of peace time

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1 *Spec Rep Ser med Res Coun Lond* no 268 Researches on the Measurement of Human Performance By N H Mackworth H M Stationery Office Pp 156 4s

Special Articles

THE COST OF THE HOSPITAL SERVICE IN A TEACHING HOSPITAL

A GILL
A.H.A., F.I.A.C
TREASURER, UNITED OXFORD HOSPITALS

D M LIVOCK
A.C.A

BEFORE the introduction of the National Health Service it was customary for the voluntary hospitals to issue annual reports containing details of their finances and statistics for the year ending Dec 31 These reports appeared between April and September Tables based on them were then compiled and published in the statistical summary of King Edward's Hospital Fund for London and the *Hospital Year Books* of the British Hospitals Association It was thus possible for anyone interested in hospital economics to form some idea of the trend of hospital costs and of how hospital services were being used The report of the Comptroller and Auditor General on the accounts of hospitals and executive councils for the first nine months of the health service has now been published[1] But this does not give any analysis of the cost of individual hospitals, and in view of the increases in the estimates for the health service it may be of interest to examine the cost accounts of one hospital, the Radcliffe Infirmary, Oxford, for the period July 5, 1948, to March 31, 1949, and to compare them with an almost similar period immediately preceding the appointed day—i e, Oct 1, 1947, to July 4, 1948

TABLE I—ANALYSIS OF OUTPATIENT ATTENDANCES AND COST

—	Oct 1 1947 to July 4, 1948	July 5 1948 to March 31 1949
New outpatients	26,737	34,355
Outpatient attendances	141 874	145 725
Total cost	£48 215	£64 376
Average cost of each outpatient attendance	6s 10d	8s 10d
Average cost of each outpatient	£1 16s 1d	£1 17s 6d
Analysis of cost of each outpatient		
Cost of outpatient department	£1 2s 4d	£1 6s 0d
Cost of special services	13s 9d	11s 6d
	£1 16s 1d	£1 17s 6d

TABLE II—AVERAGE COST PER INPATIENT WEEK OF MEDICAL BEDS

—	Oct. 1 1947, to July 4 1948	July 5 1948 to March 31, 1949
	£ s d	£ s d
Provisions	1 4 11	1 13 2
Surgery and dispensary	13 4	15 1
Domestic	1 6 9	1 6 3
Salaries and wages Medical	4 2 10	2 7 11
Nursing		1 17 8
Other officers		3 2 3
Miscellaneous	8 11	7 3
Establishment	7 11	16 6
Finance	1 11	1 9
	£8 6 7	£12 7 10
Physiotherapy	1 1	1 7
X ray	8 9	12 4
Laboratories	1 0 7	1 2 10
Theatres	4 1	4 9
Occupational Therapy	—	1 8
	£10 0 6	£14 11 0
Average occupation	82%	85%

In 1937, three wards at the Radcliffe Infirmary were allocated for the use of the newly appointed Nuffield professors of medicine, surgery, and obstetrics and gynæcology, and it was agreed that the cost of certain patients should be borne by the research funds of the Nuffield Committee for the Advancement of Medicine To find out what these patients cost, a departmental costing system was instituted by which the total expenditure of the hospital was allocated to individual wards and to outpatients Details are thus available of the cost of each ward and department of the hospital and of the services they render The system has now been extended to cover the other hospitals within the United Oxford Hospitals group A general increase in costs since July 5, 1948, is shown, but it should be pointed out that all known increases in salaries, including those of medical and dental staff under the N H S, are taken into account

From table I it will be seen that, in the nine months after the National Health Service started, the number of new outpatients was 28 6% higher than in the previous nine months, while the corresponding rise in the number of attendances was only 2 7% This could imply that increased efficiency in the department reduced the need for attendances On the other hand, it might mean that a greater proportion of the patients were referred to the department for less acute conditions

Figures are available which show the average weekly cost of inpatients in medical, surgical, E N T, maternity, and private wards, and also in the research beds for neurosurgery, gynæcology, and medicine Tables II and III show the costs in the medical and the surgical wards during the nine months before and after July 5, 1948

TABLE III—AVERAGE COST PER INPATIENT WEEK OF SURGICAL BEDS

—	Oct 1 1947 to July 4, 1948	July 5 1948 to March 31, 1949
	£ s d	£ s d
Provisions	1 3 10	1 9 1
Surgery and dispensary	12 2	14 10
Domestic	1 6 4	1 5 3
Salaries and wages Medical		1 19 8
Nursing	3 12 8	1 16 6
Other officers		2 17 5
Miscellaneous	8 3	6 8
Establishment	8 1	10 10
Finance	1 9	1 7
	£7 13 1	£11 1 10
Physiotherapy	2 9	4 3
X ray	6 10	8 5
Laboratories	9 9	11 5
Theatres	1 13 9	2 13 11
Occupational therapy	—	8
	£10 6 2	£15 0 6
Average occupation	84%	93%

As one would expect, the cost of a surgical bed is higher than that of a medical one, for it carries a greater share of the theatre costs

The percentage increase is 45 for medical beds and 46 for surgical beds The period is too short to allow of generalisation, but it is evident that if allowance is made for the increases in the salary scales of medical and hospital staff, the introduction of the health service did not cause a phenomenal rise in costs

TABLE IV—ANALYSIS OF TREATMENT AND COST OF INPATIENTS

—	Oct. 1 1947 to July 4, 1948	July 5 1948 to March 31 1949
New inpatients treated	9260	9113
Inpatient days	121 922	122 666
Average daily inpatients	444	454
Average stay in days	13 2	13 5
Cost per inpatient	£19 11s 9d	£30 1s 2d
Cost per inpatient week	£10 8s 3d	£15 12s 6d
Total expenditure	£181 361	£273 937

1 See *Lancet* 1950 i 681

Œstrogen therapy also lessened or eliminated the pain in the bones and produced general constitutional improvement Albright concluded that bone formation is influenced by certain of the steroidal hormones According to his hypothesis the steroidal hormones, promoting anabolism of protein, stimulate the osteoblasts, while the "sugar active" corticoids of the adrenal cortex, which inhibit protein anabolism, depress the activity of the osteoblasts At the time of the menopause the laying down of organic matrix fails to keep pace with bone resorption and a reduction in bone substance results

THE NUFFIELD FOUNDATION

THE Nuffield Foundation was brought into being for the purposes of promoting health, social well being, and the care and comfort of the aged poor The trustees might thus have diffused the funds over a vast field of constructive endeavour Instead, they wisely chose to concentrate them where the need was keenest, and the report for the past year [1]—the first of the Foundation s second quinquennium—shows that this policy remains unchanged In curative medicine, substantial grants have been promised for investigations of the modes of action and methods of synthesising 'Cortisone' and allied substances and earlier projects in the fields of medicine (including social medicine), the natural sciences and the social sciences are promised further support In its second five years the Foundation is concentrating particularly on fundamental research, notably in biology and sociology In biology new grants have been made for studies of the factor determining the difference between cell types, of various types of learning system, of the control of regional determination in embryos and of the migration of cells in embryos and in adult life, of X ray analysis of crystals, and of tissue culture In sociology grants are being made for investigations of the costs of founding and raising a family, of the patterns of family life, of the techniques of social surveys, and of the progress of 2000 Scottish 11 year olds, in the whole range of intelligence, who were first tested in 1947 By its fellowships and scholarships the Foundation has already done much to bring together teachers and others in the Commonwealth who might otherwise never have met, and it is now prepared to take a more direct hand in Commonwealth affairs by grants for research in overseas universities and similar institutions (A Nuffield research professorship of mechanical engineering has already been endowed in New South Wales) The Foundation now discharges its obligation to the aged through the National Corporation for the Care of Old People, but the report speaks pertinently of one aspect which is becoming more important

> "The increasing infirmity which often accompanies increasing age is a problem which every home for the able bodied—whether run by local authorities or by a voluntary society—has to face eventually, for, however spry the residents may be when admitted, some of them will decline into progressive ill health and will need much more physical help and more continuous care than a lightly staffed home can easily provide At present it is nearly always impossible to gain admittance for a case of this kind into hospital Indeed there is a real danger that in a few years from now many of the homes recently established may degenerate wholesale into medical slums, unless some simple and smooth transition can be effected to a stage half way between the two types of care provided respectively by the welfare and the health authorities"

Every project, says the report, is measured against its presumed, or even its speculative, contribution to the practical betterment of life Perhaps the Foundation's most notable achievement has been to further rational humanitarianism

1 The Nuffield Foundation Fifth Report Published by the foundation, 12–13, Mecklenburgh Square London, W C 1

HUMAN PERFORMANCE

OWING partly to war time research, we are fairly well placed to assess capacity for work and the causes of failing performance During the late war Dr N H Mackworth conducted extensive studies of performance in a wide variety of tasks, and his findings now published,[1] will be of interest far outside the confines of the psychological laboratory Indeed he provides good evidence for the claim that "it has now become perfectly possible for experimental psychology to give assured and practical answers to questions concerning the limiting conditions under which even complex human operations can be maintained at a high level of accuracy with the minimum strain"

Dr Mackworth's studies, directed to the solution of problems arising in the extremely practical circumstances of armed conflict, owed much, as he points out, to the inventiveness and theoretical brilliance of K J W Craik whose influence on the present generation of experimental psychologists has been profound The investigations fall into two main groups, concerned with (1) vigilance, and (2) the effects of environmental stress In the work on vigilance the situations which, under Service conditions, had produced the problems were imitated closely in the laboratory Two visual tasks were studied in connection with the difficulties found in 1943 in the routine use of radar, and auditory vigilance was studied in a third task simulating the operation of an 'Asdic' apparatus In all three tasks significant deterioration, as measured by the number of signals missed was found during a two hour watch, beginning before the end of the first half hour This deterioration was related to the difficulty of the task and the competence of the operator, for it did not take place when the initial level of missed signals was low It could be prevented for the full two hour period by methods which kept alive the operator's interest—for instance, interruption of the task by the experimenter, or supplying knowledge of results—or by amphetamine sulphate in 10 mg doses Dr Mackworth interprets these findings in terms of Pavlovian conditioning The researches on environmental stress deal with the effects of harassing gas and of high atmospheric temperatures Measurements were again made in several types of performance analogous to those required in the Services An interesting finding was that deterioration in intensive forms of work was related logarithmically to increase of temperature Physiological indices proved unreliable, except when the physiological state directly responsible for the deterioration could be identified

The experiments are clearly described and should be readily capable of repetition and extension The techniques are of a kind which ought to be of equal value in dealing with the problems of peace time

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THE first two years of the National Health Service were reviewed by Sir Andrew Davidson, chief medical officer of the Department of Health for Scotland, when he addressed the Society of Radiographers at a dinner in Edinburgh on June 23 A proper balance must, he said, be struck between the various elements of the service "more and more attention, for example, will need to be paid to those working in the homes of the people" Then, the quality of the service must be maintained at the highest standard, though "how this is to be done is difficult to see" A further requirement was to encourage research, both laboratory and sociological Finally the public must be shown how to use the service, for abuses would destroy it 'If this health service is rightly used and fostered it can become the envy of other countries, many of which, incidentally are carefully watching all the developments there"

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instinctive control of the body has not kept pace with man's needs and has ceased to be a proper guide The time has come for reasoning man to employ his intellect in the care of his body Bad use* controlled by instinct, shows its effects in all human ills How then is the body to be put under the control of the conscious mind ?

'The difficulty which has to be overcome is that 'sensory appreciation' † is defective Misuse of the body is not realised. The wrong manner of use feels and seems to be right To explain the way of misuse and to try to teach correct use *in action* fails, because as soon as man sets out to act he reverts to his instinctive way of action with its old misuse

"The first step then (in re-education) is to stop the existing habitual reaction to an impulse Attention must be concentrated on the manner in which the body is to work, and then the proper manner of working will be ensured and the act to be done may be allowed to come about

"The relationship of the head to the neck and the neck to the back in activity, is held to be the chief factor in influencing the correct functioning of the body Maintenance of the proper relationship at all times will ensure that all parts and organs of the body are working at their best The mind is brought to bear on maintaining the proper relationship That relationship, the 'primary control,' when maintained, will bring about the proper functioning of the rest of the body By constant attention to the manner in which acts are performed, and especially constant attention to the head neck back relationship, the acquired manner of using the body will take the place of the wrong instinctive manner, and the body will function with the least effort and to the best advantage And thus by taking thought, man will convert a 'badly used himself' into a proper being

TERMINOLOGY

Judge Clayden agreed that "in Alexander's book these ideas are tangled in a mass of words"

One of the chief difficulties in the whole action was to agree on a terminology which would ensure that the witnesses were talking about the same thing Judge Clayden early established the terminology which he would employ

"Mainly the evidence relates to the effect of good body mechanics on health and the prevention of disease, and to the possibility that alteration in posture' or the 'better use of Mr Alexander can improve body mechanics When I use the term 'body mechanics I shall use it as defined by Dr Goldthwait 'The mechanics of the function of all the parts of the human body—bones, joints, muscles, viscera and nerves' 'Posture,' I think, means the carriage of the limbs and body as a whole Where in my view the question or the answer in evidence uses these words in some different sense, I shall mention. Mr Alexander and Dr Barlow shun the word posture to avoid confusion I shall use for the technique of Mr Alexander the phrase 'Proper Use'"

Judge Clayden held that Mr Alexander's main principles were "that man's health is deteriorating that a main reason for this is the misuse of the body that the misuse of the body cannot be corrected (by ordinary methods) because of faulty sensory appreciation that 'proper use' can however be taught (by his method) that the maintenance of a proper head neck relationship will to a large extent bring about 'proper use' that 'proper use,' so taught, will improve health and prevent disease Whether misuse of the body may be a cause of deterioration in health is so bound up with the question whether the Alexander technique can improve health and prevent disease that it has to be considered with those matters" These principles would, Judge Clayden suggested, have to be proved unsound if the defendants were to maintain their allegation that Mr Alexander's system "is quackery in the fields of physical education and medicine"

INFLUENCE OF BODY MECHANICS ON HEALTH

Considering in detail the evidence whether good body mechanics cannot improve health and prevent disease, and whether "proper use" (the Alexander technique) cannot bring about good body mechanics, Judge Clayden pointed out that "Prof Samson Wright is only prepared to concede that posture could have bad effects in cases of grave abnormality Professor Adrian says that posture could obviously have bad effects, though he is not prepared to say what degree of abnormal posture would have those effects He says that it is a commonly accepted view that good bodily functioning makes people less prone to disease Sir Henry Dale says that 'such use of the body as a whole as keeps it in good health' may affect certain diseases

"Dr Barlow in his evidence refers to various American authorities Dr K G Hansson [1945], a doctor acknowledged by Dr Jokl to be an authority, reaches the following conclusion 'The relation between health and body mechanics is soundly based on physical laws and on physiology There is increasingly strong clinical evidence of posture and health being the cause and effect in many conditions' The book *Essentials of Body Mechanics in Health and Disease*, of which the chief author is Dr Goldthwait, also an acknowledged expert, has passages which have been referred to in evidence on the effect of good body mechanics in health and in the prevention of disease In the preface, pp v–vi, this is the view expressed 'the proper training of the body for the greatest physical efficiency and the early recognition and treatment of faults which lead to disease are the chief business of the physician In this prophylactic role of medicine, the development of good body mechanics plays an important part' Dr Barlow also relies in support of his view upon *Principles and Practice of Physical Therapy*, edited by Professor Pemberton, and on the American Medical Association's *Handbook of Physical Therapy*, especially the passage at p 118, reading 'Clinical evidence strongly suggests an intimate relationship between body mechanics and health'

"These books by recognised authorities, or published with sanction of a recognised body, can only be used in support of the evidence of Dr Barlow But the effect of all this evidence, and particularly the statement of Professor Adrian that it is a commonly accepted view that good bodily functioning makes people less prone to disease is that it certainly cannot be said that the defendants have proved that good body mechanics cannot lead to improvement in health and in a general sense to the prevention of disease"

THE HEAD-NECK RELATIONSHIP

The next stage in Judge Clayden's judgment dealt in detail with the relationship of the physiological researches of the late Professor Magnus to the Alexander method This arose out of the following inaccurate statement by Jokl (1944)

'The cornerstone of Alexander's 'conscious control' theories is a discovery allegedly made by the late Professor Rudolph Magnus, who is said to have established the existence of 'the primary control of the individual' This legendary 'primary control,' we are told, if properly brought

* The term use is employed by Alexander to denote the manner in which the parts of the body can be disposed in relationship to each other The expression bad use is employed by Alexander to denote *patterns of* movement which are instinctive habitual, and thoughtless and which at the same time do not serve to promote optimum physiological functioning

† using this term, Alexander does not imply that sensation in the clinical sense (as determined for example by Head s tests of perception) is necessarily defective but that the perception of the body image in movement—the kinæsthetic equivalent of movement—is often defective Judge Clayden said later on this point Sir Henry Dale and Professor Adrian speaking of the works of Sir Charles Sherrington agreed that there is a difficulty in forming a sensory appreciation of ordinary acts In so far as faulty sensory appreciation is at the foundation of Mr Alexander s method it has not been shown that he is not right in alleging that it does exist and that its existence is a difficulty in the way of teaching another method of performing ordinary acts

The picture of the work and cost of inpatient treatment as a whole given in table IV shows that there was little difference in the volume of the work undertaken in the two periods

The analysis of ward costs shows that nearly 17 5% of the cost of medical beds and nearly 35 6% of the cost of surgical beds arises from the cost of the services given by the special departments, such as radiology, laboratories, physiotherapy and operating theatres

TABLE V—ANALYSIS OF OUTPUT AND COST OF SPECIAL DEPARTMENTS

—	Unit	Oct 1, 1947 to July 4 1948			July 5 1948, to March 31, 1949		
		No of units	Total cost	Unit cost	No of units	Total cost	Unit cost
			£	s d		£	s d
Biochemistry	Examination units	35 396	2 891	1 8	48 998	4 749	1 11
Pathological	Examination units	194 666	18 681	1 11	200 481	22 529	2 2
Operating theatres	Operating minutes	163 724	19 744	2 5	196 255	26,937	2 9
Physiotherapy	Treatments	42 163	6 456	3 1	49 459	6,867	2 9
X ray	Examination units	193 842	18 173	1 11	242,700	21 005	1 9

Table V shows that the cost of each of these departments increased, but the increase is no doubt justified by the greater use made of them as shown by the higher output figures The cost per unit of output has not risen unduly

A distinct difference is evident between the comparatively small percentage increase in the unit cost of these treatment departments and the percentage increase in the weekly cost of inpatients This difference is perhaps due partly to the ability of the departments to expand their work without having additional accommodation, whereas the output of the wards is closely limited by the number of beds

Now that the United Oxford Hospitals is an administrative teaching group, it is possible to give details of the average costs per inpatient week of each of the constituent hospitals (table VI)

TABLE VI—SUMMARY OF WARD AND DEPARTMENTAL COST OF CONSTITUENT HOSPITALS FROM JULY 5, 1948, TO MARCH 31, 1949

—	Cost per inpatient week	Number of beds	Average occupation
	£ s d		
Radcliffe Infirmary	15 12 6	505	454 90%
Churchill Hospital (an acute general hospital used as an integral part of the Radcliffe Infirmary but not for emergency work)	12 18 11	242	198 82%
Osler Pavilion (for tuberculous patients)	8 11 9	62	55 89%
Sunnyside Convalescent Home	6 12 9	36	28 78%
Cowley Road Hospital (for long stay cases)	6 18 7	250	237 95%
Slade Isolation Hospital	14 13 1	80	36 45%
Cold Arbour Hospital (for long stay tuberculous patients)	10 9 10	31	26 84%

The figures given in this article may not be typical for the country as a whole, but we hope they may serve as a guide to present hospital costs and as an indication that since the National Health Service started there has been no great increase in costs other than that occasioned by increases in salaries They also show that for a hospital always working to capacity there can be little change in inpatient services, but that outpatient services have tended to increase, even in an already overcrowded department

Points of View

THE ALEXANDER LIBEL ACTION

WILFRED BARLOW
M A , B M Oxfd
LATE REGISTRAR, DEPARTMENT OF PHYSICAL MEDICINE, MIDDLESEX HOSPITAL LONDON

An unsuccessful Supreme Court Appeal at the end of last year marked the close of a legal action which will be of interest, and possibly of importance, to those engaged in physical education and rehabilitation The action touched on many procedures which are used in physical education and physical medicine, and expert opinions were given by eminent scientists, including Sir Henry Dale, O M , F R S , Prof L D Adrian, O.M. F R S and Prof Samson Wright The publications put into court as evidence covered a large field of physiology and medicine

The general background to the legal action has been well summarised by Mr Norwood Cooke, K C (1949), but briefly the story is as follows After some preliminary skirmishing, in and out of print, Dr E Jokl the physical education officer of the South African government, published a strong attack in a government publication (1944) against a method of re education evolved by an Australian, Mr F M Alexander, about fifty years ago , the method has in recent years met with support in medical and educational circles Dr Jokl's article was put forward as a scientific analysis of Alexander's method, but no scientist would have said that it was written in a scientific manner In the words of the Appeal Judges of the Supreme Court

> "It will be noticed that there is an appreciable quantum of malevolence in the article It is not a dispassionate scientific analysis and consideration of the theories and claims in Alexander's books, but it directs ridicule and contempt not only at these theories and claims, but to some extent at the plaintiff in person "

The article was in fact couched in such terms that Alexander had little alternative but to request its withdrawal, and, when this was refused, to sue for defamation

For many years I have studied the Alexander method, and I have written about it in the medical press (1945, 1946, 1947, 1948) For this reason I was asked to give evidence on its scientific soundness, and this I attempted to do It seemed to me that the good points of the method should as far as possible be defended, since these in my view far outweighed the weaknesses

The case came up for trial in Johannesburg, before Mr Justice Clayden, in 1948 In the previous year evidence had been taken on commission at South Africa House in London from a number of scientists in this country The South African government attorney undertook the defence of the editors of the publication, and Mr Oswald Pirow, K C , was briefed as counsel for defence Judgment was given for Alexander in the sum of £1000 with costs which ran into five figures, and this was confirmed in 1949 at the Supreme Court of Appeal, where it was found that the article was defamatory and not a fair representation of Alexander's theories

In discussing the case, to avoid being controversial, I will quote from the actual judgment, which is a comprehensive document, summarising much of the 450,000 words given in evidence

THE ALEXANDER METHOD

In his brief summary of the Alexander method Mr Justice Clayden said

> "The underlying concept is that man in early time was a creature whose bodily functions were regulated by *instinct*, instinct properly adapted to his needs in the course of evolution With the rapid advance of civilisation,

of Mr Alexander's technique in practice In my findings on this part of the case I am not, I think, disregarding the very expert evidence which the defendants have led The evidence could no doubt have discussed fully how far the Alexander technique, as applied in practice, could lead to good body mechanics But through the misunderstanding of the technique expressed in the article, it has not on the whole been led in this regard

"Dr Jokl, who gave evidence after the technique had been fully explained by the witnesses for the plaintiff, deals more directly with this matter He denies that improvement in *posture* can bring about good body mechanics, but the grounds of the denial are, I consider, that improvement in posture brings about nothing, because it itself must be brought about by other factors, which are the factors responsible for improving the body mechanics

"As against this evidence there is the evidence of Dr Barlow In the field of medicine he does not pretend to speak with the authority of the English witnesses, or Dr Jokl. What he does maintain is that he, as a doctor, has studied the Alexander technique, and that he can therefore express with reason his views on the effects of it

"It is here that the defendants find themselves in a difficulty What has to be proved is that the technique cannot improve health and prevent the diseases which it claims to prevent All of the witnesses for the defendants say that they cannot discover what Mr Alexander does to bring about 'proper use,' from his books none of them has seen the technique in operation The defendants have in my view to prove not only that the system as described is unsound but that as described and in operation it is unsound They have to prove, on the issue which I am now considering, that persons who have undergone a course of instruction from Mr Alexander or his teachers, do not thereafter have improved body mechanics Since none of the defendants' witnesses have seen such a person this is difficult The evidence which is given as to the absence of effects of altered posture is not, I consider, evidence which can show this, because the posture which is spoken of is not 'proper use' it is not a position of advantage continuously maintained in movement And the defendants do not offer proof that Mr Alexander's teaching does not in fact bring about improvement in body mechanics, whilst the plaintiff does offer such proof

JUDGMENT ON THE SOUNDNESS OF THE METHOD

"In the absence of evidence showing on the balance of probability that 'proper use,' as taught, cannot improve body mechanics, and by reason of the evidence as to the effect of good body mechanics, the defendants have in my view failed to establish that the system is unsound They have shown that Mr Alexander supports his technique by wrong physiological reasoning and by reference to work which almost certainly has nothing to do with it But that in my view is not enough.

"In regard to the claims to prevent disease, the defendants in the article said that a claim was made to prevent practically every known disease This was not, I think, claimed in the books. In regard to the diseases which he does claim to prevent, although I am far from saying that the evidence shows that claim to be sound, yet I consider that the defendants have not proved the negative they had to prove they have not shown that what might lead to improved health might not prevent diseases for which the causes, or factors which build up resistance, are unknown They have failed in my view to prove that the system cannot bring about the results which it does claim in the improvement of health and the prevention of disease, and again they have made matters worse by overstating the claims made for the system The claim to improve health has not been shown to be baseless, even in the medical field."

DISCUSSION

I am not concerned here with the rest of the judgment, which covered a large field of legal matters The important thing to decide is not whether Alexander may have given a misleading description of his work in the past but whether the actual method itself is going to repay further investigation in the future The method rather than the man is what matters, and Alexander would be the first to agree with this

Firstly, it is significant that the tremendous body of expert evidence which was brought by the defence, was unable to prove the method unsound Rigorous statistical proof of the type demanded by the defendants for the method, is in fact available for extremely few medical procedures and Professor Adrian pointed out that much of the customary handing out of bottles of medicine in general practice is scarcely scientific It need not be stressed how great is the need now for a suitably controlled investigation of the method

Secondly, it is necessary to consider seriously the novel suggestion that the head-neck relationship is of particular importance to the functioning of the whole organism Although the *Zentralapparat* which Magnus described in *Körperstellung*, has been shown not to be of immediate relevance to Alexander's theories, nevertheless Magnus's Croonian and Cameronian lectures (1925, 1926) do draw attention to the importance of the head-neck relationship in man and work on the therapeutic implications of the tonic neck reflexes is being done on hemiplegics at the Bellevue Institute of Rehabilitation in New York (Covalt 1949) A recent report on this work states "The utilization of the tonic neck reflex in the rehabilitation of hemiplegic patients has, in our experience, had a marked effect on motivation The reasons for its effectiveness are not obvious We feel its implications rest, to a large extent, on a psychological basis"

Prof Raymond Dart, professor of anatomy in Johannesburg, and one of the most eminent anthropologists in the world, has recently given his backing to Alexander's views on the head-neck relationship (Dart 1946 1947) I have discussed elsewhere in detail much of the other anatomical and physiological support (Barlow 1947 1948) Recent work by two psychiatrists, Burrow (1949) and Reich (1949), confirms the importance of commencing re-education at the head end of the organism And, perhaps most significant of all, there is the recent work of H G Wolff (1948) Writing on the head and neck muscles in anxiety he says

> 'The patients in this group probably constituted the greatest number of any thus far considered. Records showed marked muscle contraction. The patient was unaware of any muscle contraction at the time The symptoms are common signs of emotional tension and represent one of the major problems confronting the medical profession. The mechanism of the head symptoms was continuous muscle contraction. It may be added that even strong contraction of the muscles of the neck is often below the level of ordinary awareness In some instances the contraction may be symbolic of withdrawing the head from a noxious agent or of stabilising the head on the shoulders for a charge against the threat Experiments have demonstrated by electromyography that the sustained contraction of muscle is a source of pain and paræsthesiæ intense dissatisfied apprehensive, anxious people Although presented as but one of the nine patient groups, it is numerically the largest"

Re-education by the Alexander method involves among other things teaching the patient to eliminate these neck tensions which are below the level of ordinary awareness and which distort the head-neck relationship The association of emotion and muscle tension which is effected in the head-neck region may be one of the most important mechanisms by which emotion produces disease in many psychosomatic conditions

into play, enables man to subject not only all his muscular actions but also the work of his internal organs to the supervision of his will"

Judge Clayden ruled quite definitely that Alexander made no claim to be able to teach people to control the working of their internal organs He pointed out that the only claims to "control" which Alexander made, came in passages of which the following is an example

For example, though it is not possible to control the viscera directly we can control directly the muscles of the abdominal wall which enclose the viscera" The manner in which Alexander links up "conscious control" with what he terms 'the primary control," appears in the following passage from his writings

"Readers of my book *The Use of the Self*, will remember that when I was experimenting with various ways of using myself in the attempt to improve the functioning of my vocal organs I discovered that a certain use of the head in relation to the neck, and of the neck in relation to the torso and the other parts of the organism, if consciously and continuously employed ensures, as was shown in my case, the establishment of a manner of use of the self as a whole which provides the best conditions for raising the standard of functioning of the various mechanisms, organs, and systems I found that in practice this use of the parts, beginning with the use of the head in relation to the neck, constituted a primary control of the mechanisms as a whole, and that when I interfered with the employment of the primary control of my manner of use, this was always associated with a lowering of the standard of my general functioning This brought me to realise that I had found a way by which we can judge whether the influence of our manner of use is affecting our general functioning adversely or otherwise, the criterion being whether or not this manner of use is interfering with the correct employment of the primary control This 'primary control,' called by the late Professor Magnus the 'central control,' depends on a certain use of the head and neck in relation to the use of the rest of the body" (Alexander 1932)

Prof Samson Wright dealt carefully with this point and established that what Alexander was referring to as his "primary control" has nothing whatever to do with Magnus's concept of the *Zentralapparat* which refers to centres in the brain stem Summing up on this point, the Appeal Judges said

"It requires an appreciable amount of anatomical and physiological knowledge to understand the experiments of Magnus and a considerable knowledge of technical terms to understand the published description of the experiments The expert witnesses called for the defence say that Alexander's knowledge of these subjects is very limited and some of them suggest that he never read any description of Magnus's experiments but was given a second hand account of them which he did not understand It is further more clear that before Magnus published the results of his experiments Alexander had already in his two earlier books attached great importance to the proper carriage of the head and neck In the circumstances it is impossible to infer dishonesty rather than conceit and ignorance on the part of Alexander in relation to his claim to have anticipated Magnus in his discovery of a 'central control' It seems to be not at all unlikely that he saw some resemblance between his theory about the head neck relationship and Magnus's experiments, based upon some vague understanding of what he has been told about those experiments and came to the conclusion that what he had found out about the position of the head and neck was a discovery similar to the one made by Magnus

Judge Clayden went on to point out that even if Alexander had misinterpreted Magnus in this one respect, this did not upset his own theory about the head neck relationship "Much of the evidence of the expert witnesses was given on the basis that Mr Alexander said that there was some centre in the body through which the mind could control the functions of the body To show that Professor Magnus talked of nothing of the sort does not assist the defendants such evidence proves only that what is not a basis of the Alexander technique is not sound When asked instead to assume that all that the 'primary control' meant was a relationship of the head to the neck, Sir Henry Dale, the intimate friend of Professor Magnus, says 'Magnus showed that the relation of the head to the neck had great reflex effects on all other parts of the body of the animal,' and agrees that Magnus put forward the phrase 'When the head moves, the body follows' Professor Adrian says the same He says that what Magnus showed in animals 'has not been shown in man,' and gives as a reason the fact that in four footed animals 'the head is in a different relation to the body than it is in man' A passage from the book of Sir Charles Sherrington, *The Endeavour of Jean Fernel*, which reads 'To take a step is an affair not of this or that limb solely but of the total neuromuscular activity of the moment—not least of the head and neck,' was a passage with which he agreed ‡

"Prof Samson Wright discussing the movement of the head in normal actions says 'That would have effects on certain muscles in other parts of the body,' and says it is 'extremely difficult to demonstrate any significant change in organs other than the muscles' by reason of the relation of the head to the neck Dr Jokl says that there might be a connection between what Professor Magnus showed in decerebrate animals and a changed posture in human beings by reason of a certain head neck relationship, assuming that posture was so changed, but he says he would require proof of that connection

"In the world of science it is no doubt necessary for Mr Alexander to show that the maintenance of a certain head neck relationship can in man improve the functioning of the body In this case it is not necessary for him to do so The defendants in their article have chosen to assert the contrary, and in this court have undertaken to prove that what they say is true Challenges by witnesses to Mr Alexander to substantiate what he claims cannot prove the truth of what the defendants assert Assuming that Mr Alexander can derive no support for his theory, that the maintenance of a certain head-neck relationship can have effects on the bodily functions of man, from the works of Professor Magnus, because those works did not deal with man, still the defendants have to prove Mr Alexander wrong It is a criticism then that he may wrongly claim support from those works but the proof that he is wrong has to be given otherwise

DOES THE ALEXANDER METHOD IMPROVE BODY MECHANICS ?

Judge Clayden continued "What has to be proved is that 'proper use' (the Alexander method) cannot bring about good body mechanics Prof Samson Wright explains that a great many of the physiological reasons which Mr Alexander sets out in support of his technique are wrong In his study of the technique which was only from the books, he has restricted himself entirely to Mr Alexander's physiology Very little of the evidence relates to the possibility of Mr Alexander 'proper use' bringing about good body mechanics When witnesses do speak of posture, or the head neck relationship, they seem to be referring to some posture which is adopted for a while for a particular purpose and not to the maintenance of a position of advantage to the body in all activity of the body The emphasis which was placed by Dr Jokl on the supposed 'primary conscious control,' and the alleged ability to control all organs, has I think caused the evidence to be mainly directed to showing how false such conceptions are The evidence for the defendants is designed rather to support Dr Jokl's article than to deal with the effect

‡ The sentence immediately preceding this in Sir Charles Sherrington's book reads Mr Alexander has done a service to the subject by insistently treating each act as involving the whole integrated individual the whole psycho physical man.'

money on housing High costs were the worst feature of the problem, and anything that could be devised to reduce them would be welcomed But in the meantime he was not in an apologetic frame of mind

Vaccination of Hospital Staffs

In the House of Lords on June 22, Lord CLYDESMUIR drew attention to the danger of employing in or about fever hospitals people who had not been adequately protected against smallpox by vaccination In the recent outbreak in Glasgow, of 18 confirmed cases, 6 had no vaccination scars These patients all died, and they were the only patients who did die Of the 12 who had vaccination scars 10 took a light form of smallpox The remaining 2, who had a more severe attack but recovered, had been vaccinated eighteen and forty-three years respectively before they were attacked In the outbreak in the West of Scotland mass vaccination would not have been necessary if it had been possible by administrative measures to check the disease more nearly to its source of outbreak The disease was most usually found in an isolation hospital, and that should receive the first measure of protection Vaccination was still compulsory in many circumstances, as for example when taking up an appointment abroad Why should not the same care be extended to those exposed to risk in isolation hospitals, subject, of course, to conscientious objection?

Lord AMULREE quoted figures published by the old Metropolitan Asylums Board to show that in the twelve outbreaks of smallpox between 1892 and 1929, though there were 19,900 patients, there were only 15 cases of secondary infection among the people in charge of the patients He thought that the reason for this comparative immunity was the board's insistence that their staffs should be successfully and regularly vaccinated He would like to hear that administrative action was being taken to tighten things up so that no one should be employed in an infectious diseases hospital who had been not only vaccinated, but successfully vaccinated Lord HADEN-GUEST agreed that the staffs of fever hospitals should be vaccinated, not only for their own protection but also because otherwise they might contract smallpox and give it to other people He also agreed that vaccination should not be made compulsory for people who had conscientious objection But it should be possible to see that people who did not submit to vaccination went neither to India as governors nor to infectious diseases hospitals, where they were likely to come into contact with smallpox

Lord MORRISON, in the course of his reply, said the Government were fully alive to the need for adequate protective measures in hospitals against smallpox and other epidemic diseases Special steps were being taken to bring the matter to the attention of hospital authorities in the National Health Service and to give them guidance on the measures to be taken The problem of protection was not confined to fever hospitals, any rules for protection should also be applied to general hospitals, and indeed to workers in other branches of the health service as well The National Health Service Act provided for the repeal of compulsory vaccination, and the Government did not think it right to impose compulsion on nurses when it did not apply to the rest of the community This might well adversely affect recruitment to the nursing profession, and the difficulty might be even greater with domestic staff who tended to move freely from hospital to other work Nevertheless, the Government were in full sympathy with the end which Lord Clydesmuir had in view, and after consultation with local authorities, medical officers of health, and others concerned instructions were being issued to the hospitals in England and Wales and Scotland laying down that where staff was likely to be subject to special risk, both in general hospitals, children's hospitals, and infectious diseases hospitals, all recruits to the staff would be offered vaccination unless they could present clear evidence of having been recently vaccinated Staffs already in posts would be offered re vaccination from time to time, at least once in every three years There might have to be some modification of these arrangements for transient employees whose hospital service was short and who were not brought into contact with patients This, however, would be the only exception Experience suggested that staff whose duties brought them into contact with patients were unlikely to refuse vaccination, especially when care was taken—as it would be—to present the offer suitably and make arrangements for carrying out the vaccination without delay If a nurse did decline to be vaccinated, the hospital authorities would arrange for her to be employed on duties where the risk of contact was reduced to a minimum

All hospitals would be required to maintain accurate and up to date records showing the vaccination position of each member of the staff This would ensure that prompt and effective action could be taken as soon as a case of, or a contact with, smallpox arrived in hospital. When that happened vaccination or re vaccination would be offered immediately to all members of the staff and at the same time, their vaccination position would be checked so as to remove from any risk of contact anyone who was not protected This would apply not only to nurses but to domestics, ambulance attendants, and anyone else at the hospital who was exposed to the risk of contact

Hospitals which were actually designated for the admission of smallpox patients should an outbreak occur, were in a special category As an invariable rule their staffs must be adequately protected by periodic vaccination and also by re-vaccination when, or if possible before, the first case was admitted The staff of these smallpox units were normally volunteers who had offered their services on the clear understanding that their vaccinal state would be maintained at a high level by re vaccination and the question of compulsion did not, therefore, really arise What had been said applied primarily to smallpox, but it was now the normal practice for hospital nurses to be immunised against diphtheria, and typhoid and paratyphoid fevers In addition, to help to protect nurses against tuberculosis, they were now being offered inoculation with B C G vaccine in appropriate cases

Hospital authorities had also been reminded of the necessity for working closely in all matters regarding the control of epidemic diseases with the medical officers of health It was essential that such officers should be warned at once when there was any suspicion of a case of smallpox in a hospital, or of any other similar disease which might be the forerunner of an epidemic

The Government believed that most of the measures outlined fell within what was already recognised to be good hospital practice, and that they were taken as a matter of routine by most hospital authorities The new instructions would ensure that the measures were taken by all hospitals and this would reduce the risk to hospital staffs to the minimum It was important, however, that this problem should be seen in its true perspective While the Government were instructing hospital authorities to take every necessary precaution, the actual risk of hospital staffs being exposed to smallpox had proved in practice to be slight There were peculiar circumstances about the recent unfortunate outbreak in Glasgow, and while this was not a matter for prediction, there was no reason to fear repetition The Government did not feel that they would be justified, as a result of this one case, in taking the extreme step of enforcing compulsory vaccination on one class of the community—nurses and other members of the hospital staff—who, perhaps more than any other, were fully conscious of the value of protective measures and could be trusted to take a responsible view of their duty to themselves and to the rest of the community

Future of Kingston Victoria Hospital

In the House of Commons on June 21, Mr J A. BOYD-CARPENTER asked whether the Kingston Victoria Hospital was to continue as a separate entity, or be merged as the maternity wing of a larger county hospital He appreciated that there were complaints for which specialist treatment in a larger hospital was necessary, but there were also cases where the patient was right in desiring treatment in a smaller hospital in which it was possible for the general practitioner, who had had general care of the case for years, could continue the treatment

Thirdly, it appears that if Alexander's observations on "defective kinæsthesia" are correct, much of the work at present being done in the field of rehabilitation and remedial exercises is misapplied, since the problem is not one of physical education but of *psycho* physical education The state of present re educational methods has been shown to be unsatisfactory by Laplace and Nicholson (1936) in one of the best studies available They found that out of 50 patients only 23 showed any improvement after posture training, and, of these, only 8 retained any improvement after twelve months This result is to be expected when the problem is seen as one of physical education Faulty habits of "use" cannot be altered in any lasting manner until there has been 'kinæsthetic re-education'—a re education of the patient's conception of what constitutes the right amount of tension to use in his daily activities In many spheres of life, the complete interrelationship of mind and body is now accepted there appears to be no reason why mind body dichotomy should be expected to work successfully in the spheres of physical medicine and physical education if it has been discarded as inadequate in other spheres

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Parliament

The Housing Situation

THE only person in the country who was satisfied with the housing situation, Lord LLEWELLIN suggested in opening this debate in the House of Lords on June 21, was the Minister of Health. But this ministerial complacence was not shared up and down the country In his budget speech Sir Stafford Cripps had said that the Government had decided that the housing programme would run at 200,000 houses for the next three years, and after the indecision shown since the devaluation crisis Lord Llewellin welcomed a firm target though he regretted it was not higher Apart from a possible increase of imported raw materials, he himself could not see why we had to alter our housing programme because of the devaluation crisis In the face of the crying need for more houses it was surely one of the last things upon which expenditure should be cut

The ARCHBISHOP OF YORK deplored that the present policy of the Government was not reducing the population in the slums Year by year the slums were increasing in number and in horror He was not a critic of the Government's main housing policy He agreed that it was a remarkable achievement to have built or made habitable over a million houses He was sure the Minister of Health was right in first building houses to let rather than to sell But the time had come, he affirmed, when we needed some new departure which would bring influence to bear directly upon the slums. The war, he continued, had interrupted the campaign against the slums True, its first effect had been to destroy some of the worst slums through the bombardment from the air But almost immediately new slums came into existence, for the people driven from their houses had to find refuge in houses which were already overcrowded. He doubted whether at any time in the last hundred years overcrowding had been so grave and the slums so disastrous as at present For the housing problem, he pointed out, affected almost every kind of social problem. It affected the health of the people, the greatest increase in tuberculosis had taken place in these congested areas We were trying to improve the education of the country, the children from overcrowded districts were backward, for they had no opportunities for doing their homework and at night they were often disturbed. Juvenile delinquency was also closely linked with housing, children from overcrowded homes spent their evenings in the street where they easily dropped into gangs out of sheer restlessness Unhappy marriages were often due to the long wait for a house or to sharing a home with in laws If there was another evacuation from the slums tomorrow there would once more be an outcry at the children who were unsatisfactory in their cleanliness and their habits. We should not blame the parents but the conditions under which these children were forced to live It was all the more deplorable that many wage-earners with large families could not afford what new houses there were. He recognised that it would be useless to ask the Government to increase their subsidies, but he did suggest that some people living in these subsidised houses could afford to pay higher rent. Could the subsidy not be gradually shifted over to help those unable to pay the present rents? He feared that sometimes almost out of despair we were apt to acquiesce in the existence of slums He knew the Minister of Health as a man of dynamic energy, and he appealed to him to divert that energy to dealing with the problem of the slums

Viscount SAMUEL, who spoke for the Liberal peers in the absence of Lord Amulree, urged his listeners not to allow themselves to be fogged by a cloud of statistics They must judge by results. The people were not sufficiently housed and they could not get away from that. The Government had rendered many services to the nation in improving social conditions, but in housing they must bear the blame for a failure which was evident and which inflicted the greatest injury upon the people

The Earl of SELKIRK believed that future historians would look with dismay on a generation who were competent aviators, who were moving from radio to television, who were on the verge of the atomic age, but who could not provide themselves with reasonable houses. Glasgow for instance had a waiting list of 100,000 The rate of building was about 4000 a year Thus anyone who married in Glasgow tomorrow could expect a house in time for their silver wedding The cost of the 200,000 houses which it was planned to build was about half of what was spent in this country on gambling and probably a sixth of what was spent on tobacco and alcohol.

Lord MONTAGU of BEAULIEU gave a constructive turn to the debate by describing the houses now being built at Orpington, Kent, by the L C C The builders had contracted to build 100 of these houses in 100 days with only 45 workpeople. They were constructed of cement blocks made of a mixture of shingle, sand, and cement The blocks were made in moulds of any size needed to build a house, and one man could in one day make the equivalent of 2000 bricks Furthermore these houses needed no timber and were cheaper to build than prefabs, costing about £1200–£1300

In his reply Lord ADDISON said he would blame no government for not solving the housing problem in a year or two If we continued to build 200,000 houses a year for the next generation then we should have begun to make a considerable impression on the problem. That was the kind of problem it was. We had 253,000 workpeople employed on building houses. A further 250,000 were repairing houses We were also building new factories, new power stations, schools, and hospitals. Which of these, he asked, were the noble Lords going to chop off? Since the war over a million new homes had been provided, including 612,859 new houses in England and Wales and 73,160 in Scotland. New standards of living had rightly altered the character of the demand. and we were spending an unprecedented amount of

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Viscount SAMUEL, who spoke for the Liberal peers in the absence of Lord Amulree, urged his listeners not to allow themselves to be fogged by a cloud of statistics They must judge by results The people were not sufficiently housed and they could not get away from that The Government had rendered many services to the nation in improving social conditions, but in housing they must bear the blame for a failure which was evident and which inflicted the greatest injury upon the people

The Earl of SELKIRK believed that future historians would look with dismay on a generation who were competent aviators, who were moving from radio to television, who were on the verge of the atomic age, but who could not provide themselves with reasonable houses Glasgow, for instance had a waiting list of 100,000 The rate of building was about 4000 a year Thus anyone who married in Glasgow tomorrow could expect a house in time for their silver wedding The cost of the 200,000 houses which it was planned to build was about half of what was spent in this country on gambling and probably a sixth of what was spent on tobacco and alcohol

Lord MONTAGU of BEAULIEU gave a constructive turn to the debate by describing the houses now being built at Orpington, Kent, by the L C C The builders had contracted to build 100 of these houses in 100 days with only 45 workpeople They were constructed of cement blocks made of a mixture of shingle, sand, and cement The blocks were made in moulds of any size needed to build a house, and one man could in one day make the equivalent of 2000 bricks Furthermore these houses needed no timber and were cheaper to build than prefabs, costing about £1200–£1300

In his reply Lord ADDISON said he would blame no government for not solving the housing problem in a year or two If we continued to build 200,000 houses a year for the next generation then we should have begun to make a considerable impression on the problem That was the kind of problem it was We had 253,000 workpeople employed on building houses A further 250,000 were repairing houses We were also building new factories, new power stations, schools, and hospitals Which of these, he asked, were the noble Lords going to chop off? Since the war over a million new homes had been provided, including 612,859 new houses in England and Wales and 73,160 in Scotland New standards of living had rightly altered the character of the demand, and we were spending an unprecedented amount of

ıev on housing High costs were the worst feature he problem, and anything that could be devised to ıce them would be welcomed But in the meantime vas not in an apologetic frame of mind

Vaccination of Hospital Staffs

n the House of Lords on June 22, Lord CLYDESMUIR w attention to the danger of employing in or about er hospitals people who had not been adequately tected against smallpox by vaccination In the ent outbreak in Glasgow, of 18 confirmed cases had no vaccination scars These patients all died, l they were the only patients who did die Of the who had vaccination scars 10 took a light form of allpox The remaining 2, who had a more severe ack but recovered had been vaccinated eighteen l forty-three years respectively before they were acked In the outbreak in the West of Scotland ss vaccination would not have been necessary if it d been possible by administrative measures to check e disease more nearly to its source of outbreak The ease was most usually found in an isolation hospital, d that should receive the first measure of protection ccination was still compulsory in many circumstances, for example when taking up an appointment abroad hy should not the same care be extended to those posed to risk in isolation hospitals, subject, of course, conscientious objection?

Lord AMULREE quoted figures published by the old etropolitan Asylums Board to show that in the twelve ıtbreaks of smallpox between 1892 and 1929, though ıere were 19,900 patients, there were only 15 cases of condary infection among the people in charge of the atients He thought that the reason for this compara ve immunity was the board s insistence that their affs should be successfully and regularly vaccinated He would like to hear that administrative action was eing taken to tighten things up so that no one should e employed in an infectious diseases hospital who had een not only vaccinated, but successfully vaccinated Lord LADEN-GUEST agreed that the staffs of fever hospitals hould be vaccinated, not only for their own protection ut also because otherwise they might contract smallpox nd give it to other people He also agreed that accination should not be made compulsory for people vho had conscientious objection But it should be ossible to see that people who did not submit to accination went neither to India as governors nor to nfectious diseases hospitals, where they were likely to come into contact with smallpox.

Lord MORRISON, in the course of his reply said the Government were fully alive to the need for adequate protective measures in hospitals against smallpox and other epidemic diseases Special steps were being taken to bring the matter to the attention of hospital authorities in the National Health Service and to give them guidance on the measures to be taken The problem of protection was not confined to fever hospitals, any rules for protection should also be applied to general hospitals, and indeed to workers in other branches of the health service as well The National Health Service Act provided for the repeal of compulsory vaccination and the Government did not think it right to impose compulsion on nurses when it did not apply to the rest of the community This might well adversely affect recruitment to the nursing profession, and the difficulty might be even greater with domestic staff, who tended to move freely from hospital to other work Nevertheless, the Government were in full sympathy with the end which Lord Clydesmuir had in view, and after consultation with local authorities, medical officers of health, and others concerned instructions were being issued to the hospitals in England and Wales and Scotland laying down that where staff was likely to be subject to special risk, both in general hospitals, children's hospitals, and infectious diseases hospitals, all recruits to the staff would be offered vaccination unless they could present clear evidence of having been recently vaccinated Staffs already in posts would be offered re-vaccination from time to time, at least once in every three years There might have to be some modification of these arrangements for transient employees whose hospital service was short and who were not brought into contact with patients This, however, would be the only exception Experience suggested that staff whose duties brought them into contact with patients were unlikely to refuse vaccination, especially when care was taken—as it would be—to present the offer suitably and make arrangements for carrying out the vaccination without delay If a nurse did decline to be vaccinated, the hospital authorities would arrange for her to be employed on duties where the risk of contact was reduced to a minimum

All hospitals would be required to maintain accurate and up to date records showing the vaccination position of each member of the staff This would ensure that prompt and effective action could be taken as soon as a case of, or a contact with, smallpox arrived in hospital When that happened vaccination or re vaccination would be offered immediately to all members of the staff and at the same time their vaccination position would be checked so as to remove from any risk of contact anyone who was not protected This would apply not only to nurses but to domestics, ambulance attendants and anyone else at the hospital who was exposed to the risk of contact

Hospitals which were actually designated for the admission of smallpox patients should an outbreak occur, were in a special category As an invariable rule their staffs must be adequately protected by periodic vaccination and also by re-vaccination when, or if possible before, the first case was admitted The staff of these smallpox units were normally volunteers who had offered their services on the clear understanding that their vaccinal state would be maintained at a high level by re-vaccination and the question of compulsion did not, therefore, really arise What had been said applied primarily to smallpox, but it was now the normal practice for hospital nurses to be immunised against diphtheria, and typhoid and paratyphoid fevers In addition, to help to protect nurses against tuberculosis, they were now being offered inoculation with B C G vaccine in appropriate cases

Hospital authorities had also been reminded of the necessity for working closely in all matters regarding the control of epidemic diseases with the medical officers of health It was essential that such officers should be warned at once when there was any suspicion of a case of smallpox in a hospital, or of any other similar disease which might be the forerunner of an epidemic

The Government believed that most of the measures outlined fell within what was already recognised to be good hospital practice, and that they were taken as a matter of routine by most hospital authorities The new instructions would ensure that the measures were taken by all hospitals and this would reduce the risk to hospital staffs to the minimum It was important, however, that this problem should be seen in its true perspective While the Government were instructing hospital authorities to take every necessary precaution, the actual risk of hospital staffs being exposed to smallpox had proved in practice to be slight. There were peculiar circumstances about the recent unfortunate outbreak in Glasgow, and while this was not a matter for prediction, there was no reason to fear repetition The Government did not feel that they would be justified, as a result of this one case, in taking the extreme step of enforcing compulsory vaccination on one class of the community—nurses and other members of the hospital staff—who, perhaps more than any other, were fully conscious of the value of protective measures and could be trusted to take a responsible view of their duty to themselves and to the rest of the community

Future of Kingston Victoria Hospital

In the House of Commons on June 21, Mr J A BOYD CARPENTER asked whether the Kingston Victoria Hospital was to continue as a separate entity, or be merged as the maternity wing of a larger county hospital He appreciated that there were complaints for which specialist treatment in a larger hospital was necessary, but there were also cases where the patient was right in desiring treatment in a smaller hospital in which it was possible for the general practitioner, who had had general care of the case for years, could continue the treatment

Kingston Victoria Hospital was a hospital of that kind Public opinion in the district was all but unanimous, and medical opinion entirely unanimous, that this hospital should continue as a small general practitioner unit, but the Minister of Health had refused to take steps to save the hospital Those who opposed the extinction of the hospital had sought to meet the legitimate concern of the regional hospital board by putting forward a compromise proposal under which the annexe of the Victoria Hospital would be used as the maternity wing That had been inspected by all the competent people, and he was told that a distinguished gynæcologist, who would be in charge of the maternity unit, had indicated that in his view these premises would be satisfactory

Dr CHARLES HILL said that everyone realised the responsibility of the Minister of Health for specialist services but it was in the public interest that there should be an ample provision of general-practitioner beds where general practitioners could, in the interests of those patients whose domestic and housing conditions made it necessary, treat their own patients in hospital surroundings

Mr ARTHUR BLENKINSOP, parliamentary secretary to the Ministry of Health, said the Minister had expressed quite clearly in circulars to the regional hospital boards his desire that general practitioners should not be excluded from small hospitals He was glad that the amended proposals had been put forward by the regional hospital board taking that point into account There were bound to arise differences of opinion in a particular area when the hospital board was attempting to secure the best possible use of the accommodation available, but the boards did attempt to reach reasonable conclusions It was proposed to use the Kingston Victoria Hospital for a most vital purpose In this area there was an urgent need for more maternity accommodation, and this proposal would affect quite a number of hospitals within the group It meant for the group as a whole an increase from 81 to 96 maternity beds and from 37 to 40 gynæcological beds The board in their revised proposals suggested the Surbiton annexe should be used for general medical cases—this would be open to general practitioners—and also that, as far as practicable, there should be posts offered for clinical assistants But Mr Blenkinsop could not give a guarantee that every practitioner who at present had access to the Kingston Victoria Hospital would automatically secure a clinical assistantship The desire was that within what was regarded as the proper clinical needs of the area the general practitioner should not be cut off from hospital work It seemed to the Minister that these modified proposals adequately covered that point

QUESTION TIME

Medical Services in Malaya

Colonel M STODDART SCOTT asked the Secretary of State for War if additional medical personnel had arrived in Malaya and whether he was satisfied that an adequate service was being provided —Mr JOHN STRACHEY replied During my recent visit I naturally looked into this matter very carefully I think that the supply of specialists in Malaya is completely satisfactory I found no hospital or unit which felt they were short of specialists, although it is true to say that in some cases they are short of general practitioner establishment For example, the base hospital at Singapore is short of general practitioners in the sense that they are below establishment There are quite enough practitioners to cope with the work in hand now, and no man is suffering for lack of general practitioner attention. However, I should like to get the number up a bit towards establishment in case the present wonderful health record of the troops does not continue quite as well That we are attempting to do The hon and gallant gentleman will appreciate the difficulty of getting general practitioners at the moment, but we are sending more out

Mr STRACHEY added that the health of the troops in the Far Eastern Command was excellent The medical authorities had assured him that, taking one thing with another, the sickness rate was below, rather than above, that of the troops in the United Kingdom

Advertising of Hospital Staff Vacancies

Sir HUGH LUCAS TOOTH asked the Minister of Health what was the cost, for any convenient area, of advertising in the press for vacancies on hospital staffs —Mr A. BEVAN replied The total cost during 1949–50 for all non teaching hospitals in England and Wales was approximately £500,000

Sir HUGH LUCAS TOOTH Does not the Minister think that is a very large sum to pay to newspaper proprietors? Is he aware that in many cases these advertisements are almost duplications of one another with perhaps one word changed?—Mr BEVAN I have already called the attention of regional hospital boards to my view that this is an excessive sum but it must be remembered that when the service was being built up very large numbers of additional domestic servants were being recruited for the hospitals and that advertising was necessary for that purpose For two or three years I was pressed to increase the employment of domestic staff in hospitals and we succeeded in doing this This was one of the ways of doing it

Grading of Hospital Medical Officers

Mr G H OLIVER asked the Minister whether he was aware that doctors who were refused consultant status and graded as senior medical officers under the National Health Act had been compelled, in order to obtain posts carrying consultant status, to leave their hospitals and go to others and that the vacancies thus created had been advertised and filled not by doctors graded as senior medical officers but by consultants, and whether this practice had his approval —Mr BEVAN replied During this transitional period some posts graded for consultants are inevitably held by individuals who have been graded only as senior hospital medical officers It must of course, always be open to these officers to seek advertised consultant appointments at their own or other hospitals, if they think they are likely to qualify for them. Mr OLIVER Does not the Minister appreciate that it causes a great deal of unnecessary hardship if doctors must move to obtain a status to which they ought to have been graded in the first place?—Mr BEVAN On the contrary, it would cause very considerable hardship if a doctor who had already been graded as a senior medical officer could never have a chance of being regarded as a consultant

Queen Victoria Hospital, Morecambe

Sir IAN FRASER asked the Minister why this hospital had been converted from a general practitioner hospital to a surgical hospital —Mr BEVAN replied I am informed that this was a hospital where specialist work was done by general practitioners supported by visiting specialists The change made by the regional board has been to give specialists charge of this work

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In answer to a question Mr BEVAN stated that the annual pre war intake of students in dental schools in the United Kingdom was about 400 The corresponding figure now was between 600 and 700, fluctuating according to the places available The number of applicants greatly exceeded the number of vacancies

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Dr A D D BROUGHTON asked the Minister what was the present annual cost to the National Health Services of drugs and dressings, and how much of this sum represented the payment of purchase tax —Mr BEVAN replied In the twelve months ended May 31, 1950, a total sum of £32,820,218 was paid to general medical practitioners and chemists for the provision of pharmaceutical services It is estimated that purchase tax accounted for about 1% of this amount

Homes for Old People in Scotland

In answer to a question Miss M HERBISON stated that since the passing of the National Assistance Act, 1948, local authorities in Scotland have opened 6 homes for old people 21 others have been acquired and are at various stages of preparation, while the acquisition of 16 others is being considered

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THE idiom is catching, like chickenpox in a Boy Scout camp, and so is the spelling, so by the time I got thru visiting around in Madison, Peoria, and South Bend, I was feeling right to home I was relieved to find it was now seldom necessary to explain that a Welshman was not a Limey but a Celt, and a Celt was not a draughty sort of drape tied round the middle of Scotsmen Confidence was restored and I faced the return from the wide prairee to New York without any of the horrid feeling of being a fugitive from Ellis Island (Despite the impeccability of my papers and introductions to the Lambs and the Yale Clubs and the Academy of Medicine, that was how I felt a short month before.) I had no hesitation now in giving the visiting fireman routine a twirl, and sent in my card to the chief of a very famous clinic I need not have worried the first time Despite the business of the chief, the clinic, and New York in general, my advent appeared to have a top priority rating, an experience which for me was strictly novel

But this is prolixity—another catching complaint endemic in the Mid-West, in my experience at least The real point of this fauteil is that I going on a ward round with the chief when in came, in a striking white uniform, who but Miss America, or at least if it was not she herself, certainly a top contender for that honor She was wheeling a gleaming truck with as many gadgets on it as a B28's instrument-panel, topped by a shining dome of chromium the shape of an old-fashioned straw bee-hive I could not even hazard a guess at what this apparatus was, anyhow it was way out of my league So playing the local rules I cracked, "What gives with the Wasistmeter Doctor? Is it a super-Geiger counter or is the beautiful lady Flash Gordon's girl friend?" "Oh, that's our clinic Beautitian with her portable apparatus" The chief saw this was still double-talk to me, so he explained further "A long time ago we found that it was impossible to overestimate a woman's preoccupation with her appearance. She might have no more natural endowment than Ziegfeld would have seen in a Flathead Indian, but that is quite irrelevant to the importance her looks have for her So it's simple If they want to go through the motions of beauty-culture why not let them? Even if we think it is screwy, it is dead serious to the women patients It keeps them contented and occupied, and I'm sure it is therapeutically beneficial" 'It is quite useful diagnostically too," he added with a smile "When they fail to show interest in the Beautitian's visit they are very ill indeed By the way, our Beautitian is of course also a trained nurse, so she can adjust her ministrations to ensure that the patient is not overtired by them"

He told me a good deal more of this service the clinic supplied, and though my first reaction was distinctly adverse I was eventually sold on the proposition. After all, why not? Look at the time, energy, and money the ladies spend on their frontage when they are up and around, and it makes them happy So if they want to buy themselves a hair do and manicure in hospital, and if this will hasten their recovery, well good luck to them.

* * *

Having lost more than one encounter with examiners, and having seen and heard my most penetrating remarks become the hackneyed howler of the year, I seized with alacrity the chance of becoming an examiner myself I have, of course, often examined my examiners, and failed them, but only in those precious unreal moments on going to sleep or waking up The examination I conducted, this time in reality, was on first-aid I spent the day feverishly reading the manuals and wondering whether the candidates were doing likewise and feeling as nervous as I did. I survived all the vivas but was disappointed that I had no "howler" with which to regale my friends and puff up my ego The written papers however saved the day To a question about the treatment of narcotic poisoning one candidate replied "I would keep him awake by walking him around the room, at the same time slapping the soles of his feet with a wet towel. Also at the same time I would give an emetic and strong black coffee" If only I had been given this answer in a viva, I might have smiled sweetly in the way examiners do, and said "You are assuming, of course, that you possess two pairs of hands and that the patient possesses two pairs of feet and two stomachs" But more probably I wouldn't have thought of this until the candidate had got away

* * *

WARM AGGLUTININ

I knew a Warm Agglutinin that worked in our laboratory
Who had a most remarkable capacity for oratory
There wasn't any subject that was vague or allegorical
Of which my late acquaintance wouldn't make himself the oracle,
No germ of an idea that wouldn't take a rapid root in an
Unlimited unstony ground—my friend the Warm Agglutinin

The style of his delivery was varied—now declamatory,
Now logical, now pleading, now amusing, now inflammatory
He argued about everything, both with and without premises,
He spoke for many hours on the Necessity of Nemesis
When two or three erythrocytes were gathered close together
He would give them his ideas on the Importance of a Tether,
Or a normoblast, regardless of its patent immaturity,
Was treated to a talk on the Illusion of Impurity
He said the Song the Sirens Sang was silvery but soluble
—A simple thought which made him wax particularly voluble

At first these dissertations were diverting and amusing
(We found his manner was, perhaps, a little bit confusing),
But slowly we discovered that in any proposition
He was never for the Government but with the Opposition
The burden of his argument was always so terrific
We never thought at first that he was wholly non-specific,
For some of us were anti this, and anti-that the rest of us,
But he was anti-everything, reacting with the best of us
Eternal Anti-Anti, anti-Self, and anti-God, he
Was a house divided in itself, an Auto antibody

While many opportunities were present and get-at-able
We never found a blessed thing with which he was compatible.
We tried to overlook his faults, his lack of specificity,
But all was unavailing, he aroused so much publicity
In spite of all our tactfulness and generous expedients
He carried in himself the stuff of civil disobedience
The time arrived at length when we had made our last exploratory
Attempt to find a little niche for him in our laboratory,
And so he had to leave us for the Desert and the Distance
Where, with others like himself, he lives the Image of Existence

Moral

The Moral of this anecdote you surely haven't missed—
When a man is Anti-Everything he Ceases to Exist
As a Wilful Individual Enjoying the Immunity
Extended to an Antibody's Work in the Community

* * *

The other morning, one of my peptic ulcer patients came into my surgery and asked for a certificate proving that he really had an ulcer He explained that he was a member of the same darts team as his butcher, and the butcher had promised that if he could produce medical evidence to show that his ulcer was a reality, he would save him a tender lamb chop whenever there were any Was I to stand on my dignity and deprive my patient of his vision of a future strewn with succulent lamb chops? Surely not So I gave him the certificate

* * *

The physician had been discussing the parasites that may cause diarrhœa. "Tell me," he said suddenly to one of the students, "all you know about *Giardia lamblia*" "Well," came the reply, "he *was* the mayor of New York."

* * *

DEAR IF ILLITERATE SIR (June 24),—Peccavi, but how about Cæsar Bell Gall 2, 4 *Galli qui ea loca incolerent?*

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He told me a good deal more of this service the clinic supplied, and though my first reaction was distinctly adverse I was eventually sold on the proposition. After all, why not? Look at the time, energy, and money the ladies spend on their frontage when they are up and around, and it makes them happy So if they want to buy themselves a hair do and manicure in hospital and if this will hasten their recovery, well good luck to them.

* * *

Having lost more than one encounter with examiners, and having seen and heard my most penetrating remarks become the hackneyed howler of the year, I seized with alacrity the chance of becoming an examiner myself I have, of course, often examined my examiners, and failed them, but only in those precious unreal moments on going to sleep or waking up The examination I conducted, this time in reality, was on first-aid. I spent the day feverishly reading the manuals and wondering whether the candidates were doing likewise and feeling as nervous as I did. I survived all the vivas but was disappointed that I had no "howler" with which to regale my friends and puff up my ego The written papers however saved the day *To a question about* the treatment of narcotic poisoning one candidate replied 'I would keep him awake by walking him around the room, at the same time slapping the soles of his feet with a wet towel. Also at the same time I would give an emetic and strong black coffee" If only I had been given this answer in a viva, I might have smiled sweetly in the way examiners do, and said "You are assuming of course that you possess two pairs of hands and that the patient possesses two pairs of feet and two stomachs" But more probably I wouldn't have thought of this until the candidate had got away

* * *

WARM AGGLUTININ

I knew a Warm Agglutinin that worked in our laboratory
Who had a most remarkable capacity for oratory
There wasn't any subject that was vague or allegorical
Of which my late acquaintance wouldn t make himself the oracle,
No germ of an idea that wouldn't take a rapid root in an
Unlimited unstony ground—my friend the Warm Agglutinin

The style of his delivery was varied—now declamatory,
Now logical, now pleading, now amusing now inflammatory
He argued about everything, both with and without premises,
He spoke for many hours on the Necessity of Nemesis
When two or three erythrocytes were gathered close together
He would give them his ideas on the Importance of a Tether,
Or a normoblast, regardless of its patent immaturity,
Was treated to a talk on the Illusion of Impurity
He said the Song the Sirens Sang was silvery but soluble
—A simple thought which made him wax particularly voluble

At first these dissertations were diverting and amusing
(We found his manner was, perhaps, a little bit confusing),
But slowly we discovered that in any proposition
He was never for the Government but with the *Opposition*
The burden of his argument was always so terrific
We never thought at first that he was wholly non-specific,
For some of us were anti-this, and anti-that the rest of us,
But he was anti-everything reacting with the best of us
Eternal Anti-Anti, anti-Self, and anti God, he
Was a house divided in itself, an Auto-antibody

While many opportunities were present and get-at-able
We never found a blessed thing with which he was compatible.
We tried to overlook his faults, his lack of specificity,
But all was unavailing, he aroused so much publicity
In spite of all our tactfulness and generous expedients
He carried in himself the stuff of civil disobedience
The time arrived at length when we had made our last exploratory
Attempt to find a little niche for him in our laboratory,
And so he had to leave us for the Desert and the Distance
Where, with others like himself, he lives the Image of Existence

Moral

The Moral of this anecdote you surely haven't missed—
When a man is Anti-Everything he Ceases to Exist
As a Wilful Individual Enjoying the Immunity
Extended to an Antibody's Work in the Community

* * *

The other morning, one of my peptic ulcer patients came into my surgery and asked for a certificate proving that he really had an ulcer He explained that he was a member of the same darts team as his butcher, and the butcher had promised that if he could produce medical evidence to show that his ulcer was a reality, he would save him a tender lamb chop whenever there were any Was I to stand on my dignity and deprive my patient of his vision of a future strewn with succulent lamb chops? Surely not So I gave him the certificate

* * *

The physician had been discussing the parasites that may cause diarrhœa. "Tell me," he said suddenly to one of the students, "all you know about *Giardia lamblia*" 'Well," came the reply, "he *was* the mayor of New York."

* * *

DEAR IF ILLITERATE SIR (June 24),—Peccavi, but how about Cæsar Bell. Gall. 2, 4 *Galli qui ea loca incolerent?*

Letters to the Editor

RESEARCH UNDER THE NATIONAL HEALTH SERVICE

SIR,—In reply to a specific inquiry from our hospital management committee, the Minister has informed us that it would not be practicable to budget a set amount each year for medical research The Minister has recently stipulated that all research work must be reported to him for reference to the Medical Research Council A hospital management committee is powerless to act unless an item has been budgeted in advance and therefore there must be a delay of approximately six to eighteen months before a project can be financed This, of course, effectively excludes hospital management committees from assisting in medical research projects

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The district hospitals of this country represent a vast reservoir of clinical material for simple and yet very useful medical research Formerly, the Middlesex County Council gave willing support to small research schemes, and a lively interest in medical research developed in their hospitals If hospital management committees were allowed to budget for small items of medical research, many valuable growing points would emerge which could then be nurtured by the Medical Research Council

Central Middlesex Hospital, London N W 10 F AVERY JONES

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SIR,—In January, 1946, a patient of mine, aged 73, was confined to bed for 10 days with acute diffuse fibrositis of the back and thighs Tender rheumatic nodules were present, and movement in bed was difficult and painful She then developed urticaria, which was treated with ephedrine gr $1^1/_2$ followed by gr $^1/_2$ at 2 hourly intervals Within 6 hours the skin had cleared and so also had the fibrositis She became entirely free from pain, all local tenderness had gone, and she got up feeling immensely pleased with herself Three days later she undertook the exacting journey to Ireland with no ill effect, and she had no return of her trouble during the rest of that year

Spellbound by this unexpected result and basing my conclusions on the known properties of ephedrine, I applied the same treatment to every case of fibrositis and rheumatoid arthritis which came my way during the next few months My results were inconclusive, and in those cases in which the treatment appeared to be successful I did not discount the possibility of spontaneous remission Finally, as I contemplated an asthmatic patient in whom the asthma was relieved by ephedrine while her fibrositis and rheumatoid arthritis remained unchanged, I abandoned my activities with much disappointment

A new light is thrown on my findings, however, by the theory that circulatory adrenaline stimulates the secretion of a humoral substance by the cells of the anterior hypothalmus, which stimulates the production of adrenocorticotropic hormone (A C T H), and that the secretion and effect thereof is related to the hormone adaptive mechanism of the whole organism It would appear that in my cases the ephedrine acted in the same manner as circulatory adrenaline and stimulated the production of A C T H via the anterior hypothalmus, and that the presence or absence of hormone balance and adaptation accounted for the contradictory successes and failures in the cases so treated

I certainly feel encouraged to resume treatment of the rheumatic diseases with ephedrine, with the help of my past experience of the dosage and response If no result is obtained within 24 hours it is unlikely that any will be obtained, but if there is any initial response it is worth continuing until that response is complete. The initial dose must be high—not less than gr $1^1/_2$—and use of the drug and dosage must be related to the general make up of the patient and the likelihood of adverse side effects If there has been previous stress it might be well to begin treatment with absolute rest and a general toning down of the patient, and then, when this has been accomplished, to hit and hit hard with ephedrine In cases where the adaptive hormone mechanism is sufficiently intact, one may hope to obtain a complete remission of symptoms

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Nor is the present day general practitioner well equipped in other spheres Nobody questions his ability to carry on general practice as his grandfather and his grandfather did in years gone by, but today there is far more to know about in medicine, and far more to know about it As a result, even in consultant ranks, the general physician and the general surgeon are giving way to teams of doctors working together to produce maximum benefit for the patient How can the individual G P hope to keep his head above water when the tide of learning is flowing daily faster and higher ?

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London S W 17 DAVID KERR

KERNICTERUS AND PREMATURITY

SIR,—I was very interested to learn from their article last week that Dr Aidin Dr Corner, and Dr Tovey have found that premature babies as well as those with hæmolytic disease of the newborn are particularly liable to develop kernicterus. A similar association has been noticed at the Children's Hospital Birmingham, and during the five years 1944–49, of 43 cases of kernicterus which came to autopsy 9 were unassociated with Rh or with ABO incompatibility (We are grateful to Dr A E Mourant for his help with the serology and genotyping) These 9 cases of kernicterus were all premature babies The first case to be noted was reported by Baar[1], this and the second case were those mentioned by Parsons[2] Zuelzer[3] has more recently drawn attention to the frequency with which kernicterus occurs in prematures

Kernicterus would therefore appear to be a disease associated both with hæmolytic disease of the newborn and with prematurity as Aidin, Corner and Tovey point out and it would seem reasonable to presume that in both cases it has a similar etiology One of the most striking features of kernicterus, both in erythroblastosis and in prematures is that the babies unlike those with an intracranial birth injury, show no evidence of a cerebral lesion immediately after delivery or during the next 24–48 hours, but during the third or fourth day or perhaps a day or two later in prematures opisthotonos and rigidity suddenly supervene In our last two cases of kernicterus associated with prematurity the diagnosis was suggested ante mortem by Dr E Howarth, pediatric registrar at the Sorrento Premature Babies Unit

Just as there is a physiological hyperbilirubinæmia postnatally and a physiological hypoprothrombinæmia, there is also a physiological hypoglycæmia[4] which is most marked in premature babies[5] Hypoglycæmia is known to result in damage to the nerve-cells and it seems to me reasonable to postulate that the liver in normal babies contains a supply of glycogen sufficient to last until oral feeding is initiated, but that where liver function is impaired, as in erythroblastosis, or where liver function is immature, as in premature infants, a dangerous hypoglycæmia might arise and result in cerebral damage Hyperbilirubinæmia being common to both hæmolytic disease of the newborn and to prematures the damaged cells would take up the pigment and nuclear jaundice would be manifest at autopsy

After formulating this hypothesis, our next case of erythroblastosis with kernicterus had on the seventh day of life (the day before death) as anticipated, a low blood sugar level—namely 19 mg per 100 ml.

In the next case we were able to follow the blood-sugar levels from birth. There was a fall to 20 mg per 100 ml twelve hours after delivery but thereafter the level rose gradually and when kernicterus became clinically apparent on the third day the blood sugar level had risen to 68 mg per 100 ml death occurred thirty-six hours later

The next case of erythroblastosis was given 20 ml of 50% glucose intravenously twelve hours after delivery, when the blood sugar was only 25 mg per 100 ml. twenty-two hours later the level had fallen again, to 34 mg per 100 ml but by giving 20% glucose orally four hourly a further fall was prevented and the baby has no clinical evidence of kernicterus

In three subsequent cases the blood sugar has shown no dramatic fall at any time and none have developed kernicterus

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4 Norval, M A Kennedy R L J Berkson J *J Pediat.* 1949 34 342
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In premature babies, as Norval[5] has shown there may be marked hypoglycæmia within twelve hours of delivery we have confirmed these findings It would appear that in the fœtus in utero there may be a hyperinsulinæmia so that as quickly as glucose passes through the placenta it is utilised or stored by the fœtus, if the baby is born prematurely the hyperinsulinæmia causes a rapid and immediate fall in the blood sugar level. This hyperinsulinæmia may persist as long as there is any hæmopoietic activity in the liver—this is purely conjectural—but if this is so it would explain why hyperglycæmia and kernicterus are particularly liable to occur both in prematures and in hæmolytic disease of the newborn In a normal full term baby the blood-sugar level does not fall dramatically

I cannot state that hypoglycæmia is a sine qua-non of kernicterus but there is presumptive evidence that it may be so, and that the early administration of glucose intravenously may protect the nerve-cells from damage If hypoglycæmia itself is not the initiating factor, I feel that it is in some such mechanism that we shall find the clue to kernicterus Further work is being pursued on these lines and I would like to thank Dr E Howarth Dr Barbara Davies, and Miss S A Barnett for their help and coöperation

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Not only may a hospital authority bring in the doctor concerned as a third party when sued but a patient who claims damages for alleged negligent treatment will probably sue the doctor concurrently, as a plaintiff gains certain technical advantage in having him as a defendant The Ministry of Health have directed that hospital authorities should not undertake the defence of hospital doctors who may be thus sued Moreover, the Ministry have also directed hospital authorities, if it is sought to make them liable for the negligent acts of a doctor, to take such steps as are open to them under the Law Reform (Married Women & Tortfeasors) Act 1935, to obtain from the doctor a contribution, which may amount to complete indemnity in respect of damages that may be recovered

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Furthermore although the Limitation Act, 1939, normally requires such a claim to be made within six years of the date when the cause of action accrued (which in actions founded on negligence will usually be the date of the negligent act or last negligent act), in those cases where damage from the negligent act does not arise until some time afterwards, time begins to run from the date of damage. This is of particular importance to doctors since damage resulting from alleged negligent treatment may not become apparent

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until long after such treatment was given Also, if the plaintiff is under a "legal disability" (e g, infancy or lunacy) at the date when the cause of action accrues, the six years begin to run from the time when (*a*) the legal disability ceases, or (*b*) the injured party dies, whichever occurs first Continuity of protection is therefore equally essential for retired doctors and for doctors who leave this country but continue practice overseas, including visitors from overseas who come here for a period of postgraduate work

The Medical Protection Society offers such continuity of protection not only to doctors on the permanent British Medical Register, but to those who are temporarily registered here whilst doing postgraduate work under the Medical Practitioners and Pharmacists Act, 1947, for a small compound (not "combined" as stated in Mr McFarland s letter) subscription, when they leave the British Isles and do not elect to continue membership either as retired doctors or under the overseas scheme

Medical Protection Society
Victory House Leicester Square,
London W C 2

ALISTAIR FRENCH
Secretary

THE PATHOLOGY OF VIRUS INFECTIONS RÔLE OF THE VIRUS BODIES

SIR,—I have read the contribution of Prof F W Burnet to your issue of June 10 on the mode of action of viruses, and have also had the pleasure of listening to his Crooman lecture at the Royal Society on June 14 with admiration for the initiative, drive, chemical ingenuity, and daring with which he has assailed the problem of the mode of action of viruses—one of the most difficult of the problems of pathology still unsolved

But I must disagree with him entirely when he states that there is no clear evidence of any toxic products of the virus itself Observations made not only on laboratory animals, but also on man, and spread over many years, have convinced me that, as in the case of many pathogenic bacteria including the meningococcus, the major portion of the toxic factor is contained within the virus units themselves—the elementary bodies or E B S The evidence for this view is described in a lecture which you published on May 8, 1948, under the title "Is rheumatism a virus disease?" As regards the substance in immune serum referred to by Burnet and others as "antibody," from experiments with vaccinia virus employing the ordinary lysin technique, contact in vitro for 30 minutes at 37°C in small tubes, and the rabbit's skin as reagent, it seemed likely that a part of this antibody may be thermostable lysin But in addition there are the usual specific antibodies so well known in the case of bacteria, and of these the flocculating antibodies are the most easily perceived

East Molesey, Surrey

M H GORDON

EXPENSIVE HYGIENE

SIR,—The rather costly experience of your peripatetic correspondent (June 17) in a public lavatory in the West End of London, where she and her friend were charged 8*d* for using a convenience and subsequently washing their hands, prompts me to remind your readers that in the Borough of St Marylebone there is not only free urinal accommodation but free washing facilities in all the public conveniences The object of the free washing service is to encourage personal hygiene and to prevent the spread of disease It forms part of a clean-food campaign in the borough, now crystallised in the recently established St Marylebone Clean Food Association This association has a code of practice to be observed by all engaged in the handling of food for sale to the public

Town Hall St Marylebone
London, W 1

H A BULMAN
Medical Officer of Health

TRAVELLING EXHIBITIONS ON CLEANLINESS

SIR,—The proposed travelling exhibitions briefly described in your issue of June 24 are to be welcomed.

Recently, with the very willing assistance of the C O I, we showed the film *Another Case of Poison* throughout the area In conjunction with this, we exhibited in canteens at pits and factories the Central Council for Health Education's stand on Food and Drink Infections, as we felt that this might be a good method of reaching the public through the worker of the family the film shows were primarily intended for food handlers

Over 5000 pieces of literature were taken from the stand during a fortnight's tour—which can, I think, be regarded as a good "take" No doubt the short stay of the stand (which imposed a severe burden on transport, owing to its bulk) at each place, plus the fact that the stand had not previously been exhibited by the local health authority in such places, created an atsmosphere of novelty which contributed to the results, but certainly this method of approaching the public is very hopeful, provided it is not overdone

Not being a local health authority, we could only obtain the stand on short term loan, and it appears that the number apportioned by the Central Council to this type of work is inadequate Likewise the stand could be considerably reduced in size without impairing its utility, so that it could be transported by a small van, and not require a lorry

As regards the film itself, our experience suggests that a longer programme is usually desirable we felt that shortness would commend itself to employers in releasing staff, but in some cases there was the feeling that it was so short that it was not worth going to

Chester le Street,
co Durham

A FORSTER
Medical Officer of Health

DOSAGE OF DIAMINO-DIPHENYL SULPHONE

SIR,—I wish to add a note to my article on the treatment of leprosy with diamino diphenyl sulphone (D A D P S) by mouth, which appeared in your issue of Jan 28

In the article I outlined treatment with a dosage rising from 100 mg a day to 300 mg a day, the latter dose being attained only in the fifth week This dosage is usually well tolerated by our African patients here but I suggested that it might be unnecessarily high and that a lower dose or less frequent administration might be found preferable

Studies carried out here now show that a lower dosage is effective, and similar findings have been made elsewhere[1] It is found here that a weekly dosage of 700 mg (1 tablet of 100 mg a day) is usually enough to produce a good clinical and bacteriological response, but we like to give more than this At present I am treating patients on four different dosage systems

Dose (mg) and frequency	*Weekly total (g)*
(1) 300 six days a week	1 8
(2) 300 alternate days excluding Sundays	0 9
(3) 200, six days a week	1 [illegible]
(4) 500, twice a week	1 0

There is so far no significant difference in the response to these differing dosages in lepromatous cases, but in tuberculoid cases daily administration appears to produce a more rapid response The lower dosage is somewhat more easily tolerated, though little serious trouble has been encountered on the higher dosage

Since these studies were undertaken, three different workers in different parts of India have written to me saying that Indians appear to tolerate D A D P S less readily than Africans, and that the dosage I originally recommended (300 mg each day of the week) is too high

1 Molesworth, B D Narayanaswami P S *Int J Leprosy*, 194[illegible] 17, 197 Muir E Personal communication

or them, progressive anæmia is not uncommon It is ood to be able to assure these workers, and any others ho may be experiencing this difficulty, that the dosage f D A D P S can be considerably reduced with little or o loss of therapeutic efficacy Moreover, the lower osage still further reduces the already very low cost f this form of sulphone treatment

I would point out once more the vital necessity of a low induction of treatment with D A D P S, even with hese lower dosage levels The standard dose should not e attained for at least one month, and perhaps not for ix weeks or more

Leprosy Research Unit
Nigeria Leprosy Service,
Uzuakoli Nigeria JOHN LOWE

CANCER OF THE UTERINE CERVIX

SIR,—In your annotation of June 3 you say "The Cancer Act of 1939 included provision for complete egistration of cancer, one of the objects being the statistical comparison of methods of treatment This part of the Act still stands, and one or two regions have started complete registration"

This provision was made under section 1 of the Cancer Act which was, in fact, repealed by the National Health Service Act, 1946

The Minister's intention that cancer registration should extend to the whole country does, of course, still stand, and the importance of the collection of adequate records was emphasised in a memorandum sent by him to hospital boards in July, 1949 The General Register Office is now responsible for the central collection of statistics relating to cancer registration and treatment, and will shortly be publishing a report on registration in the early post war years

General Register Office,
Somerset House London W C 2 R M BLAIKLEY

ANTI-HISTAMINE DRUGS IN PARKINSONISM

SIR,—In the following case of parkinsonism I obtained good results with 'Phenergan' after getting none with 'Neoantergan'

A married woman, aged 46, consulted her doctor four years earlier because of continuous tremor of the hands Parkinsonism was diagnosed and the patient was treated with scopolamine for a long time without reaping any benefit Later she was treated with 'Parpanit' in full dosage and with intrathecal magnesium sulphate with similar results Atropine which was also tried, slightly reduced the tremor There was no history of syphilis, gonorrhœa, or trauma The Wassermann reaction was negative in blood and cerebrospinal fluid

On examination the patient had tremor of her hands and left leg while at rest Her shoulder muscles were somewhat rigid, her movements were abnormally slow, and she did not swing her arms normally in walking She had a dull sad puzzled expression on her face She was uneasy while sitting and kept changing her position She complained of a burning sensation in the lumbar region, in her palms, and elsewhere in her body, of pains in the lumbar region, and of sweating even while sitting still Her tendon reflexes were exaggerated and her plantar reflexes normal

Treatment—After treating her unsuccessfully with neoantergan I tried phenergan 0 15 g six times a day At first she complained of muscular spasms, but these passed off in two or three days, and there was a great reduction in tremor and rigidity while the phenergan was continued, whereas if it was withheld for twenty four hours these symptoms returned.

Diparcol', was also used in this case, but it did not influence the tremor and rigidity 'Benadryl' relieved muscle spasms, but it had no effect on the tremor

The full dosage of phenergan should be reached gradually, if it is given at the start of treatment it is apt to cause spasm The usual dosage is 0 2–0 4 g daily In oculogyric crises a single intravenous injection of 0 1 g, given slowly, may be effective

Istanbul M HULUSI DOSDOGRU

DAIRY-GOAT'S MILK

SIR,—I was interested by Mr Harris's letter last week As to the merits of goat's milk I express no opinion, except to agree that if obtained from a well tended herd it is pleasant and indeed hardly to be distinguished from cow's milk But would Mr Harris care to quote the evidence on which he bases his statement that "over one third of our dairy cows are tuberculous"? Even if he really means "give a positive reaction to tuberculin," which is very far from being tuberculous in the sense of having any tuberculous lesion, open or otherwise, the proportion stated seems astonishingly large and indeed difficult to believe

F LANGFORD
Lewes Sussex County Medical Officer of Health

THE editor of the *Medical Directory* writes "To maintain the accuracy of our annual volume we rely upon the return of our schedule, which has been posted to each member of the medical profession Should the schedule have been lost or mislaid we will gladly forward a duplicate upon request The full name of the doctor should be sent for identification" The directory is published by Messrs J & A. Churchill Ltd, 104, Gloucester Place, London, W 1

Public Health

Heights and Weights of London School-children

THE results of a survey of the heights and weights of London school children are shortly to be published by the London County Council [1]

The accompanying table from the report shows average heights and weights, and gives a comparison

Central age (years)	Average height (in.)			Average weight (lb)		
	1949*	1938	Excess of 1949 over 1938	1949*	1938	Excess of 1949 over 1938
			Boys			
5 5	43¼	43	+ ¼	43¼	42¾	+ ½
6 5	45¾	45½	+ ¼	47¾	47¼	+ ½
7 5	48	47¾	+ ¼	53	52¼	+ ¾
8 5	50¼	49¾	+ ½	59	57½	+1½
9 5	52¼	51¾	+ ½	65	63¼	+1¾
10 5	54¼	53¾	+ ½	71¼	69¼	+2
11 5	56	55¼	+ ¾	77¼	76	+1¼
12 5	57¾	57	+ ¾	84¼	83	+1¼
13 5	60	58¾	+1¼	94¼	90½	+3¾
14 5	62¼	—	—	105¼	—	—
15 5	65¼	—	—	121¼	—	—
			Girls			
5 5	43¼	42¾	+ ½	42¼	41½	+ ¾
6 5	45¾	44¾	+ ¼	46¾	45¾	+1
7 5	47¾	47	+ ¾	51¼	50½	+1
8 5	50	49¼	+ ¾	57¼	56	+1¼
9 5	52	51¼	+ ¾	63¾	62¼	+1½
10 5	54¼	53½	+ ¾	70¾	69	+1¾
11 5	56¾	55¼	+ ½	79¼	77	+2¼
12 5	58¾	57¾	+ ¼	89½	86¼	+3¼
13 5	60¼	60	+ ½	100¼	96¼	+3¾
14 5	62	—	—	110	—	—
15 5	65	—	—	122½	—	—

* The averages at the stated age intervals are obtained by simple linear interpolation of the crude data

with pre-war averages from 5 to 15 years of age The report indicates that for both boys and girls, and at every age, there have been increases in both height and weight over the past ten years The average increase, for both boys and girls, in height is about 1 3%, and in weight 2 2% of the 1938 level For example, boys and girls aged 10 have in the past decade increased their average weight by $1^3/_4$ lb and their average height by $^3/_4$ in. As in 1938, boys are heavier and taller than girls up to the age of 11 years, while from 11 to 14 years of age the reverse applies The superiority

1 Report on the Heights and Weights of School Pupils in the County of London in 1949 By Sir ALLEN DALEY M D F R C P school medical officer London County Council The report will be obtainable from Staples Press Ltd 14 Great Smith Street S W 1 either direct or through a bookseller Pp 26 1s

in the weight of girls over boys lingers on to the 16th year, but with height the superiority of girls ends at 14 years, and for ages 15 and 16 years boys resume their lead over girls With regard to the relationship of weight to height generally, a striking feature of the changes in the averages over the past ten years is the fact that the change in weight has been proportionate to the change in height so as to leave the ratio of weight to height in each age-group almost unchanged The fact that bone and flesh have kept pace with each other, despite substantial changes in the absolute values of height and weight, suggests that with improved nutrition in school children, nature has maintained her own balance, that children of today are not merely heavier or merely taller than were their parents, but are of altogether greater physique It is as though by pre-war scales of growth the post-war children were 3 months older than indicated by their year of birth

As was known before the war, there are differences between districts of London There is a tendency for the averages for both height and weight to be greater south of the Thames than on the north side of the river Although the greatest improvement has been in those districts which were above average in 1938, there has been a definite improvement in the worst areas where war conditions produced greatest retardation and where it was known that progress would be most difficult to achieve

Poliomyelitis in England and Wales

In the 24th week, ended June 17, there were 93 (79) notifications of poliomyelitis—77 (61) paralytic cases and 16 (18) non-paralytic cases Figures for the previous week are shown in parentheses Although the upward trend continues, the recent rise is less steep than that which preceded the 23rd week The main concentration of cases continues to be in the Midlands, and 28 (20) of the 77 paralytic cases were notified in Birmingham, where there has been a total of 65 cases in the past four weeks When this foyer in Warwickshire is discounted, the figures for the rest of the country do not yet suggest the beginning of a large rise

Appointments

CUNNINGHAM R C M B Glasg D P H D P M senior M O Mental Health Service on central staff of Essex health dept
DEWAR JOHN M B Edin D P H senior asst M O H to Inverness County Council and to act as police surgeon for the burgh
GARROW HELEN M B St And D P H senior asst M O Middlesex health dept
KERSHAW J B M.B Lond D P H senior asst M O Middlesex health dept
MATSON NEILL D F R C S E D.L O consultant E.N T surgeon Mid Glamorgan hospital management committee group
WILLIAMS R M. M B Lond M R C.O G consultant obstetrician and gynaecologist Glantawe Hospital management committee group

Births, Marriages, and Deaths

BIRTHS

DENNY —On June 18 in Plymouth the wife of Surgeon Commander G C Denny R N —a son
DUNLOP —On June 14 in London the wife of Dr Eric Dunlop—a son
HEWITT —On June 17 the wife of Dr Patrick Hewitt of Bishop s Stortford—a daughter

MARRIAGES

GRIFFITHS—SMITH —On June 17 in London Glyn Griffiths M B to Barbara Smith
JAGGER—JARRATT —On June 17 at Bridlington Derek Bourne Jagger M B F M B. major R A M C to Pamela Marjorie Jarratt

DEATHS

DAWSON —On June 17 at Swindon William Richard Dawson O B E M D Dubl F R C P I aged 85
FIELDING —On June 19 Charles Henry Fielding M R C S lieut colonel I.M.S retd
FITCH —On June 17 Edward Louis Vincent Fitch M R C.S Eng aged 36
GAULD —On June 16 in Nottingham George Ogg Gauld M B Edin aged 76
GRAY —On June 16 in London George Munn Gray M D Glasg F R C.S
WARWICK BROWN —On June 21 at Westgate on Sea Alexander Warwick Brown M A M B B.SC Aberd
WYNNE THOMAS —On June 21 in London Harold Wynne Thomas M R.C.S aged 85

Notes and News

THE LAYMAN AND EPILEPSY

A MEETING is to be held at 1, Wimpole Street, Lond... W 1, on Thursday, July 6, at 5 30 P M, to inaugurate a society to further the interests of those suffering from epilepsy Lady Cynthia Coville will be in the chair, and the speakers will include Dr Russell Brain, F R C P, Dr Macdonald Critchley, Dr Letitia Fairfield, and Dr Denis Williams. The society is being formed under the auspice of independently, of the National Association for Mental Health and is receiving support from the British branch of the International League against Epilepsy

It is hoped that the association will be regarded as a memorial to the late Dr Tylor Fox, who in his lifetime did much to forward the society's main object "to enable persons suffering from epilepsy to live as normal a life as possible in society, and to educate the public into a natural and sympathetic attitude towards epileptics in all spheres of life, and to enlist the help of people and bodies to bring this about"

CONVALESCENCE FOR DIABETICS

THE ordinary convalescent home does not cater for diabetics the risk of coma is too dismaying for the matron and the thought of special diets too upsetting for the cook The Diabetic Assocation has therefore made arrangements for diabetic patients to be accepted at two homes—men at the British Red Cross Home at Burley-on the Hill, in Rutlandshire, women and children at St Mary's Home at Birchington on Sea, in Kent

A diabetic who is being stabilised, or recovering from an intercurrent illness, can profit greatly from a month's convalescence At the Burley on the Hill home the matron and a trained day sister and trained night staff nurse all have had a good grounding in their specialty Under their guidance the rest of the nursing staff quickly learn to recognise the signs of hypoglycæmia, usually only encountered in patients who have newly arrived The house is old and beautiful, set in fine grounds on a wooded hill overlooking a wide stretch of country It is two miles from Oakham, which—boasting not only the charms of antiquity but also a cinema—is well adapted to the tastes of ambulant patients and most of them are ambulant, though the home is able to look after two or three bed patients at a time for short periods To walk to Burley and bus back, and then to walk both ways, is a useful test of progress for able bodied patients Entertainments such as dances and cinematograph shows are given in the fine ballroom of the house The kitchens are simply equipped and staffed by part-time cooks from the village, but they serve good food The matron studies the diet on which the patient is admitted, and charts his carbohydrate allowance for the 24 hours Two cooked meals—lunch and dinner—are served daily, with a 20 gramme sweet at each meal, the residue of carbohydrate for each diet is altered by adjusting the weight of bread and potatoes Ample meat, fish, cheese, eggs and green vegetables are served, and meals are supervised by the matron or sister A new diabetic is said often to gain half a stone in the first week. Urines are tested before every meal, and in patients who are not stable the blood sugar is also done once a week The sister pays special attention to the patients feet and to any perforating ulcer Diabetic men from any part of England Wales, or Northern Ireland are accepted here as well as other convalescent patients from the neighbouring area

St Mary s Home at Birchington, is conveniently close to both the sea and the railway station It can receive 50 patients, who sleep in rooms of 2–5 beds each Patients with heart conditions, poor vision, or crippling disabilities sleep on the ground floor Besides three common rooms, there is a recreation hut in the garden and such diversions are arranged as coach trips to Canterbury picnics in the neighbouring countryside, and visits to local entertainments Women and girls over 13 occupy the main building, and children under that age have a separate building, Mansford House, nearer the sea Adult patients usually stay three weeks, and during that time are taught not only the principles but the details of diabetic feeding, and the technique of injecting insulin

In Mansford House there is a large playroom on the ground floor, and airy dormitories upstairs with beds for 18 children

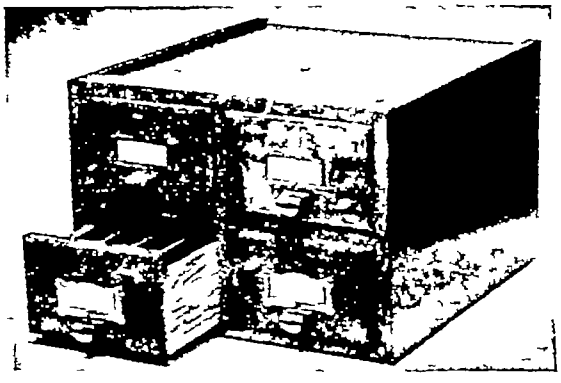
l except the toddlers learn to give their own insulin, and e taught about the carbohydrate values of their food and the inciples of dieting The average stay is 4–6 weeks Non abetic children are accepted in this home, but diabetics ive first claim A doctor visits weekly, and at other times hen necessary This home was originally sponsored by ie Diabetic Association, but is now vested in the Minister Health and managed by the Isle of Thanet Hospital anagement Committee for the South East Metropolitan egional Hospital Board, but the association is represented a the house committee, and gives generous grants towards ie patients' amenities

HOME NURSING

HOME nurses have multiplied as trained private nurses row scarcer Mrs Mary King Hutton, assisted by Dr S King Hutton, has written a clear and useful little book[1] for these mateurs, outlining the way the body works and giving dvice on the sickroom, the daily care of the patient, nursing are of infants, weaning the baby, diets and invalid cookery, nd the nursing of various classes of illness and of the very ld. All the advice is sound and simply put, and the pictures nd diagrams are informative

CABINET FOR MICROSCOPE SLIDES

Dr E Neumark writes, from St Mary's Hospital Medical School "The cabinet illustrated here has been devised after a model made several years ago by Prof W D Newcomb It has four drawers, each accommodating about 800 slides in four lines The drawers which can be easily removed, are subdivided by a slanting wooden division, and in one the



back portion is designed to hold rather wider slides In front of each slide is placed a piece of paper of the same size which may be used for relevant notes, and for classification slightly longer pieces of paper are used. Labels should be attached to the top of the slides and not, as is more usual, at the bottom. The cabinet is of the same size as those for 5 in by 3 in. record cards, but it is much more strongly constructed and will not break down under the weight of the glass Two or more cabinets can be stacked by a recessed nesting arrangement of the top They measure 13 in. by 9 in. and are 15 in. deep They may be obtained from Messrs Miller Williams, 6A, Shepperton Road, London, N 1

North East London Clinical Society

The annual dinner of this society, the first since the war, was held on June 7 Dr Brian Russell, who was in the chair proposed a toast to the Society, with the hope that after the many vicissitudes through which it had gone in the past it had now entered a new and long lease of life Dr D B Handley in his reply emphasised that the strength of these societies was dependent upon the support of the general practitioners Mr A. Dickson Wright who was the guest speaker in his address on the History of Quackery outlined some of the forces which fostered and maintained quackery even in contemporary society He stressed the need for self criticism among the profession when confronted by phenomena that still remain unsolved Mr Ralph Coyte proposed a vote of thanks to the guest speaker

1 Teach Yourself Home Nursing London English Universities Pres 1950 Pp 180 4s 6d

University of London

Prof Lilian Penson, has been re elected vice chancellor, and Mr J B Hunter, F R C S, has been appointed deputy vice chancellor for 1950–51

University of Bristol

The following have been successful in recent examinations

M.B Ch.B—R J Ancill * W A W Dutton (with distinction in obstetrics) * M D Turner (with distinction in public health) * P J D Benjafield H J Bland Margaret H Buston (with distinction in child health) E R Duchesne F V Eastman Doreen A Ellis C C Ewing Zdenek Fluss J C Gregg Roy Hill E A W Houghton G A K M Jahans Megan D M. Johnson H I Leigh (with distinction in public health) George Lucas Jean M. Menzies G W B Peel, Barbara M Philpott (with distinction in public health) L P Spence L A D Tovey Joan Walker C E Dickson † Harold Maxwell †

D.P.M (part II)—M W Annear J A Bickford R M Ellison.

D.P.H (part II)—A J Board E L Fawssett

* With second-class honours † In group II only

University of Leeds

Dr R Harper has been appointed lecturer in industrial psychology, Dr W J O Connor senior lecturer in physiology, and Dr T K Marshall lecturer in forensic medicine

Queen's University, Belfast

At recent examinations the following were successful

M.D—C G Warnock (gold medal) H B McDowell, Mary G McGeown (with high commendation) W H Shepherd D W Wallace (with commendation), N J Ainley S J G Gilmour S G McComb D G Simpson R J Young

M.B B.Ch B.A.O—Beatrice A. Russell (second-class honours) W D Addis Vivien R Boyd, P G Buckham John Burrowes H L Courtenay W J Crawford, R H Currie Irene G Douglas John Dunlop Margaret R Elder R M. Ellis Jean M. Fitzsimons Patricia Gorman Elizabeth Hawkins T L Hazelton W C Heron M McA Holmes Elizabeth L Houston Monica Kerrigan W J Love Martha E McCormack J G McKenny Sheila C McNally J B McSherry Maureen E Magowan D C S Millar D G Rice Dorothy E Robb John Smyth J E L Sutcliffe

University of Dublin

Owing to ill health Prof J W Bigger will retire on Sept 30 from the chair of bacteriology at Trinity College and from the position of dean of the school of physic there Prof D S Torrens has been appointed assistant dean for the long vacation, and he will succeed Professor Bigger as dean at the beginning of October

Order of St John of Jerusalem

The King has sanctioned the following promotions in, and appointments, to this order

As *Knight*—J H G Robertson C B E. M D

As *Commanders*—J C Ashton M B Sir Horace Evans K C.V O F.R C.P Surgeon Captain Thomas Madill, O.B E M.B. R.N

As *Officers*—H S Taylor-Young F.R.C.S, Harry Middleton, M C M.B D A B Hopkin M B Colonel F A Bearn C.B.E D.S O M.C M D, Brigadier T W Davidson M.B D J Johnson M R.C.S N M. Maclennan M D B O Bradshaw M B Lieut.-Colonel E H R Altounyan O B.E M.C. M.D F.R.C.S. Isaac Newton F R C.S Surgeon Captain A W McRorie M.D K.H.P R.N Peter Pringle M.R.C.S Lieut -Colonel E G Montgomery M.B

As *Associate Officers*—T Seshachalam, L.R C.P Squadron Leader F S Krusin M.R.C.S

Welsh National School of Medicine

Dr Harold Scarborough has been appointed professor of medicine and director of the medical unit Dr Scarborough is at present reader in medicine at the University of Birmingham.

Dr Scarborough graduated M.B. with honours at the University of Edinburgh in 1932 After holding a series of teaching and research appointments in Edinburgh he spent two years with a Beit fellowship in Prof. G W Pickering's department at St. Mary's Hospital London Later as a Rockefeller fellow he worked in Prof E M. Landis department at Harvard till in 1947 he joined the staff of the department of medicine at Birmingham Dr Scarborough took his PH.D in 1940 and he became F.R C.P E in 1947 He has published papers on ascorbic acid and vitamin P on the laevulose tolerance test of hepatic function and on stored blood

I C I Research Establishment

Imperial Chemical (Pharmaceuticals) Ltd. have purchased 350 acres of the Alderley Park Estate, near Manchester, where a research centre will be developed.

Medical Golfing Society

At the summer meeting held at Sunningdale on June 22, The Lancet challenge cup (scratch) was won by Dr M. J Healy The Henry Morris cup (bogey) was also won by Dr Healy with a return of all square

International Congress of Microbiology

The fifth International Congress of Microbiology will be held in Rio de Janeiro from Aug 17 to 24 under the presidency of Olympio da Fonseca Filho Further particulars may be had from the secretary of the congress, Instituto Oswald Cruz, Caixa Postal 926, Rio de Janeiro, Brazil

Renal Association

At a meeting of this society to be held at the Ciba Foundation 41 Portland Place, London, W 1, on Saturday, July 15, at 11 30 A M, Dr Homer Smith will give an address on the Development of Modern Renal Physiology A few tickets will be available to non members and may be had from the hon secretary, Mr John Sophian, 66, Harley Street, W 1

U S Graduates in 1949

A report in the *Journal of the American Medical Association* (June 3, p 441) shows that during 1949 a total of 5866 doctors received their first licence to practise In the same period 3600 deaths among doctors were reported The registration of doctors revealed that 93 7% were graduates of approved medical schools in the U S.A and Canada, 4% were graduates of foreign medical faculties

Biological Hazards of Atomic Energy

A two day conference on this subject is being arranged jointly by the Institute of Biology and the Atomic Scientists' Association and with the support of the British Association It will be held at the Royal Institution, Albemarle Street, London, W 1, on Friday and Saturday, October 20 and 21 The meeting will comprise four sessions as follows I. biological and medical effects of nuclear radiations, II tolerance levels and measures of protection, III biological implications, IV atomic energy and the future The chairman of the organising committee is Prof Alex Haddow, Chester Beatty Research Institute, Royal Cancer Hospital, Fulham Road, London, S W 3

Society of Chiropodists

In opening the fourth annual convention of this society Sir Cecil Wakeley, F.R.C S, regretted that in this country we were not more conscious of foot health, for foot health makes for a contented populace, and he believed that chiropodists can relieve pain in 90% of painful feet Coöperation between the medical profession and the chiropodists was important He knew that this coöperation was working well between the consultant and specialist and the chiropodist, but he was not convinced that it was working as it should between the general practitioner and the chiropodist This was a pity for in a comprehensive health service coöperation was essential between the medical profession as a whole and the medical auxiliaries

To round off their convention on June 23 the society held their annual dinner at the Park Lane Hotel, London, with their president, Mr J H. Hanby, F CH S, in the chair In proposing the toast of The Society, Lord Webb-Johnson recalled the support which the Royal College of Surgeons had been happy to give to the profession in its early days The position of auxiliaries was also stronger if they were banded together, and he was glad that the chiropodists had started from the right place with a firm code of ethics and professional standards and with one guiding authority to represent the whole profession He hoped that the scope of their work would grow like a callosity Perhaps their greatest service to the community would be their preventive work among the children which he was sure would soon discredit the old saying that in the morning you sow your seed but in the evening you cut your corns In his reply, Mr Hanby was happy to agree that the society was going from strength to strength It was emerging as a national body, and on the new Whitley Council it was representing the profession of chiropody As a society they had made a good start under the guidance of such men as Mr E G V Runting, the doyen of the profession, and they were also grateful for the coöperation and guidance which the medical profession had always offered them In proposing The Guests Miss C F Norrie, F CH.S, a vice president, was able to welcome representatives of law and medicine, other medical auxiliaries nurses negotiators, and lay members of branches and committees of the National Health Service As last man in, Sir Horace Evans returned graceful and lighthearted thanks which delighted both his fellow guests and his hosts

International Society of Medical Hydrology

A meeting of this society will be held in Italy in Flo[illegible] from Oct 3 to 7 The programme includes discussions Sweat and on Gout Further information may be had fr[illegible] Dr Donald Wilson, Cranbourne, Southdown Road, B[illegible] Regis, Sussex

Royal Statistical Society

At the 116th annual general meeting of this society the following elections were announced president, Prof Brad[illegible] Hill, D SC, hon secretaries, Mr R F George, Mr Ro[illegible] Stone, Mr Philip Lyle, hon treasurer, Mr R F Fo[illegible] Mr H Campion, of the Central Statistical Office, was awarded the society's Guy medal in silver

Retiral of Dr Graves

Dr T C Graves, medical superintendent of Ruben[illegible] Hospital for the past thirty years, and president of the [illegible] Medico Psychological Association from 1940 to 1944, retired this week Presentations made to him at a farewell luncheon on June 15 included an illuminated album, in which was noted his "distinguished service to Medicine in the correlation of mental and physical disease"

International Conference on the Venous System

From Sept 15 to 17, after the International Congress of Cardiology, which is taking place in Paris from Sept 3 to 9, the medical societies of Marseilles and Aix-en Provence, under the auspices of the Marseilles Medical Faculty, are holding at Aix en Provence an international conference on the venous system Prof René Leriche will preside, and Professor Roscam (Liége) will read a paper on the Biochemistry and Medical Treatment of Venous Thrombosis, and Professor Fontaine (Strasbourg) on the Early Surgical Treatment of Venous Thrombosis Further information may be had from Dr Beurier, joint general secretary, 4, Cours Mirabeau, Aix-en Provence

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CORRIGENDA *Rheology of Human Cervical Secretions.*—In the preliminary communication last week (p 1154) by Mr A. F Clift, Mr F A. Glover, and Dr G W Scott Blair, the legend of the figure should have opened with the words "Average log (slope) of cervical secretions"

Claims to Sickness Benefit—These claims, which were enumerated in last week's issue (p 1178), are made under the National Insurance Act, and the figures are published by the Ministry of National Insurance

Diary of the Week

JULY 2 TO 8

Tuesday, 4th

UNIVERSITY OF EDINBURGH
5 P.M (Obstetrics Lecture Theatre 60, George Square) Prof H de Watteville (Geneva) Clinical Use of Hormone Assays in the Urine (Macarthur lecture)

Thursday, 6th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields W C.2
5 P.M Sir Gordon Gordon Taylor Glands in the Neck.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE Manson House 26 Portland Place W 1
7 30 P M Sir William MacArthur Story of Smallpox in British Isles

Friday, 7th

BRITISH INSTITUTE OF RADIOLOGY 32 Welbeck Street W 1
8 P.M Dr Lauriston S Taylor (Washington) Measurement of X and Gamma Radiation over a Wide Energy Range (Silvanus Thompson lecture)

MAIDA VALE HOSPITAL MEDICAL SCHOOL, W 9
5 P M. Mr Valentine Logue Clinical neurosurgical demonstration

Saturday, 8th

BRITISH ASSOCIATION OF ALLERGISTS
11 30 A M (Dunn School of Pathology Oxford) Dr H. L. Prince (Houston Texas) Histamine Therapy
2 30 P.M Dr Boen Swinny (San Antonio Texas) Viral Allergy Dr E A Brown (Boston Mass) Present Status of A C T H Therapy in the Allergic Diseases

SOUTH EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY
10 30 A M (Darvell Hall Sanatorium Robertsbridge Sussex) Mr W P Cleland A Record of Lucite Ball Plombage Dr B Rigden Domiciliary Chemotherapy Dr Ruth Dingley Primary Tuberculosis Dr A McFarlane Demonstration of cases.

INVESTIGATION OF THYROID FUNCTION AND DISEASE WITH RADIOACTIVE IODINE *

E E POCHIN
M.D Camb, F R C.P
DIRECTOR, DEPARTMENT OF CLINICAL RESEARCH, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON

IT IS now ten years since a radioactive form of iodine was first used in the investigation of human thyroid disease, and the early work of Hamilton and Soley (1940) and of Hertz (1941) has been extended to a number of clinical problems The physiological study of the human thyroid by this method has, however, lagged somewhat behind the clinical applications, so that certain measures of thyroid function in disease tend to be empirical and incompletely understood The normal behaviour of the gland has therefore been examined by radio iodine and related to certain abnormalities in disease

It is characteristic of the early phases of any new method of investigation that the method itself appears to acquire a merit quite apart from its value in solving important problems This is to some extent healthy if its full scope and applications are to be rapidly explored It may readily result, however, in a search for isolated and random problems to which the method is applicable, rather than in the necessary integration of the new with the older techniques of study for the closer analysis of questions of outstanding importance In describing certain applications of radio iodine to the study of the thyroid, therefore, I do not wish merely to enumerate problems to which this valuable technique may be applied, but to suggest ways in which it may ultimately be woven into the full pattern of thyroid investigation

The metabolism of iodine is clearly of the greatest importance in thyroid function and in much of thyroid disease, and its detailed study by chemical methods has been outstandingly valuable and successful. The purely chemical method, however, has reached certain limitations, arising from the small quantity of inorganic iodide present in the plasma and the delicacy required in its determination, from the impossibility of estimating rates of synthesis without giving physiologically excessive quantities of iodine, and, above all, from the difficulty of any adequate study in living men The iodine content of the human thyroid cannot be examined or followed except at biopsy, operation, or autopsy, and the circulation of iodine through the body can barely be estimated even by the most indirect methods

In 1938 radioactive forms of iodine became available which were chemically indistinguishable from normal iodine and therefore metabolised identically, yet could be recognised by their radioactivity and thereby estimated quantitatively and followed in their passage through the living body (Hamilton 1938) Several limitations of the purely chemical method were removed at once for example, radio iodine can be detected in very small quantities in body fluids by measurement of its beta-radiation, while its gamma radiation, which penetrates body tissues freely, allows the concentration in different parts of the body to be followed during life Accurate investigations can be made on man after a dose of radio active iodine which is too small either to produce any significant effects upon the body by its radiation, or to disturb the course of metabolism by the amount of iodine that it contains—which is normally less than a thousandth part of a microgramme Yet, since the administered iodine is recognisable by its radioactivity, we may detect the time of its arrival in different parts of the body, or of its conversion into different chemical forms The speed of its metabolic cycle through the body, and the dynamics of its chemical equilibria, may thus be determined Hence the line of thyroid investigation, particularly in man, has moved rapidly forward, owing largely to several groups of investigators, including Hamilton, Keating, Astwood, Rawson, and Quimby, whose extensive and valuable work has been well summarised (Astwood and Stanley 1947, Keating and Albert 1949, Kelsey et al 1949, Raben and Astwood 1949, Rawson 1949, Rawson and McArthur 1947, Shanse 1949) and will not be reviewed here

In the following discussion I will deal with the normal uptake of radio-iodine by the thyroid gland and abnormalities of uptake in thyroid disease, the methods for measuring the rate of uptake, and their clinical application, the later phases of the body iodine-cycle, in the thyroid and after discharge from the gland as thyroxine, and measurements of the localisation of radio iodine, particularly in cases of carcinoma of the thyroid

Methods of Measurement

The thyroid uptake of radio iodine and its subsequent circulation through the body may be followed in some detail by measurements of a few simple types, particularly on the plasma and the urine and opposite the thyroid gland If a suitable Geiger counter is placed near any radioactive source, impulses are emitted from it at a rate proportional to the radioactivity of the source So, for example, if plasma is taken from a subject who has received radio iodine, and is poured into a glass chamber surrounding a counter tube, the counting rate which results will be directly proportional to the radio iodine concentration of the plasma This concentration may be expressed as a percentage of the dose given per litre of plasma, by comparing the counting rate with that of a standard solution from which the dose was prepared The disappearance of an intravenous dose of radio iodine from the plasma may be followed with considerable accuracy by this means

Similarly, if urine samples are tested in this way, and if their volume is known, the total percentage of the dose which has been excreted by the kidneys at any time may be computed The same method has been used in measuring the activity of saliva and other fluids which will be discussed, and is clearly also applicable to separate examinations of different chemical fractions of these fluids We have distinguished between radio iodine in the forms of iodide and combined in thyroxine, by the butanol fractionation method of Taurog and Chaikoff (1947), and we have used precipitation methods so that the protein bound radio iodine of plasma could be separately estimated. In each case the radio iodine concentration or the radiothyroxine concentration can be expressed as a percentage of the dose given, by comparison with a standard solution

A similar principle applies to the radioactivity of the thyroid gland itself, and the counting-rate at a given distance from the gland will be proportional to the thyroid radio iodine content Variations in this content may therefore be followed if a counter is placed in front of the neck opposite the gland (fig 1), and is suitably shielded with lead from the radiations of radio iodine elsewhere in the body Provided the neck position relative to the counter is kept constant, and the radio-iodine content of the neck tissues other than the thyroid

* The Oliver Sharpey lectures delivered at the Royal College of Physicians of London on March 14 and 16 Based on work undertaken for the Medical Research Council, in conjunction with B D CORBETT, B.A, the late E A G GOLDIE, M.B A. J HONOUR, and N B MYANT, B.M.

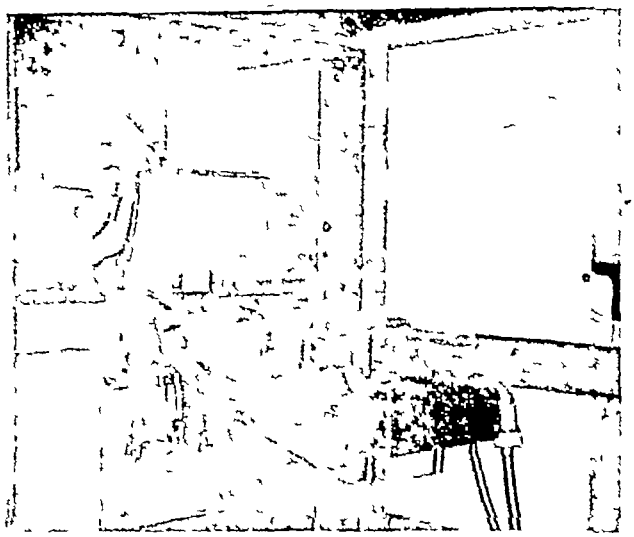

Fig 1—Lead shielded gamma counter in front of neck

is relatively small, as is usually the case, then the counting rate is proportional to the radio iodine content of the thyroid

This thyroid content may also be expressed as a fraction of the dose given, by observing the counting rate with the counter at a known distance from the thyroid This rate is then compared with the counting-rate observed when the counter was at the same distance from the original dose of radio iodine, measured before its administration To make this comparison, however, it is necessary to know, firstly, how the neck tissues surrounding the thyroid modify the counting rate, and secondly, the exact position of the radio iodine in the neck

The first problem was examined by separate experiments in which a radio iodide solution was injected into a short length of the lumen of a Ryle's tube (Myant et al 1949b)

This tube was first hung in air at a known distance from the counter, and the counting rate recorded It was then swallowed so that the dose lay in the œsophagus at the level of the thyroid gland, its exact position being determined by lateral X ray examination and the counting rate was again recorded with the counter at the same distance from the tube It was found that the neck tissues surrounding the radio iodine caused an increase in the counting rate by about 25% in the twelve subjects examined, a forward scattering of secondary radiations into the counter outweighing the small absorption of primary radiations by these tissues A suitable allowance for this effect can thus be made when estimating the thyroid content in other subjects

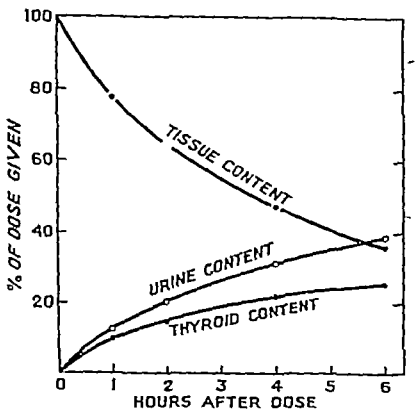

Fig 2—Percentage of intravenous dose of radio-iodide in thyroid urine and tissues ; average of 12 normal subjects

The same experiments were used to examine the way in which the counting rate falls as the distance between counter and source is increased It was found that, with radio iodine in the neck, as with any small radio active source in air, the counting rate varies with the inverse square of the distance between counter and source Consequently, the reciprocal of the square root of the counting rate increases linearly with distance between counter and neck, as this is varied, and the position of the source in the neck can be accurately determined by this means to within a few millimetres (Myant et al 1949b)

It is therefore possible, as with the urine and the plasma, to express the amount of radio iodine in the thyroid gland as a proportion of the dose given, with an error which is probably in the region of 5% of the value estimated With this information, which is obtained without disturbance even to thyrotoxic subjects, and with knowledge of plasma and urine concentration, it is possible to examine the course of radio iodine circulation through the body in a quantitative way, after the oral or intravenous administration of a solution of the radioactive element in the form of iodide

Distribution of Radio-iodide Through Body Tissues

Since radio iodide is taken up by the thyroid and the kidneys at a rate which depends upon its concentration in the plasma at the time, it is necessary to examine

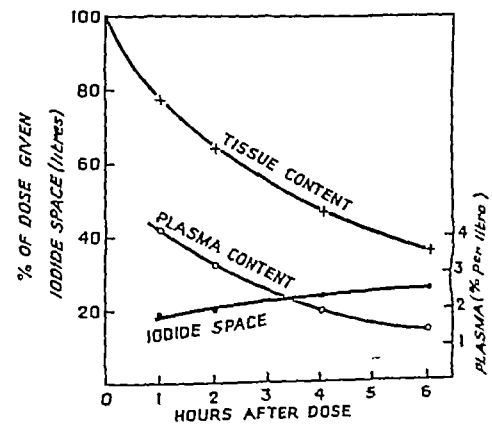

Fig 3—Comparison of non thyroid tissue content with plasma concentration in estimation of iodide space Subjects as fig 2.

the initial extent of radio iodide diffusion through the body, before the course of its thyroid concentration can be examined in detail This body distribution may be estimated from the measurements already discussed, which serve to determine both the radio iodide space and the speed with which it is filled In fig 2, the average thyroid and urinary content of radio iodine (expressed as percentages of the dose) is given for the first 6 hours after intravenous administration in a group of twelve normal young subjects Since fæcal and other excretions are small, the amount remaining in blood and non thyroid tissues is obtained by subtracting the thyroid and urinary contents from the total dose The results (fig 2) show that half the administered dose had been removed from the tissues by thyroid or kidneys within 4 hours If this total extrathyroid tissue content is compared with the plasma concentration (fig 3) the radio iodide space may be calculated For example, since the tissues contain 60% of the dose when the plasma contains 3% of the dose per litre, the space would have to have a volume of 20 litres if it contained radio iodide at the concentration present in plasma The radio iodide space, so estimated, increases rapidly for the first two hours after the dose, then approaching a limiting value of about 25 litres Hospital patients without thyroid disease have also been found to have normal radio iodide spaces (Myant et al 1950), rising to a final value of about 25 litres, or 40% of the body-weight

he radio iodide space in Graves's disease has been reater than normal at one hour, as Keating and Albert (1949) have also found

As with similar conventional diffusion spaces for odium or thiocyanate, it cannot be inferred that an natomical volume of this size is actually filled with luid at a radio iodine concentration equal to that in lasma It has been shown, for example, that gastric

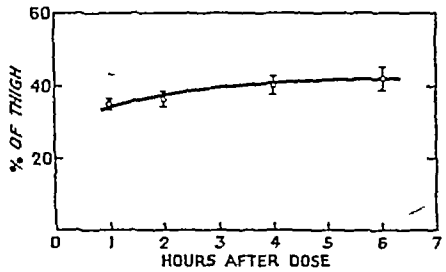

Fig 4—Penetration of radio-iodide into thigh tissues in normal subjects after intravenous dose ranges ± 2 S E.

juice and saliva contain iodide at concentrations many times that of plasma (Schiff et al 1947) We found that in *the group of twelve normal subjects the average salivary* concentration of radio iodide fell from over 200% to about 50% of the dose per litre, while the plasma concentration fell from 7 to 1½% per litre, the saliva collected in the mouth containing radio iodide at about thirty times the concentration prevailing in the plasma half an hour previously (Myant et al 1950) It has also been confirmed that gastric juice contains radio iodide in the same greatly raised concentrations of about thirty times that in plasma—which is about the concentration ratio observed in urine compared with plasma These high concentrations of the iodide ion are of some physiological interest and might possibly prove to have radiotherapeutic value Conversely, the normal cerebrospinal fluid contains iodide in concentrations lower than in plasma In ascitic fluid, measured during its aspiration, and in cardiac œdema fluid, obtained during its removal by Southey's tubes, radio iodide approaches the plasma concentration with a delay of an hour or two, which is similar to that for the body tissues as a whole, as indicated by the progressive rise of the iodide space observed during the first few hours after the dose

An alternative and more direct estimate of the entry of iodide into the tissues may be obtained from a sample area such as the thigh If the radioactivity of the thigh as a whole is followed by a gamma radiation counter placed near it, and if the counting rate observed is compared with that of the plasma, we can obtain a measure of the completeness with which radio iodide at plasma concentrations has diffused throughout the thigh, and the same rather slow equilibration is found to occur (fig 4) The diffusion in patients with Graves's disease is again either more complete or perhaps merely more rapid than normal (Myant et al 1950)

First Phase of the Iodine Cycle Thyroid Uptake of Iodide

As radio iodide diffuses from the blood stream into the tissues, or is concentrated in the alimentary secretions, its plasma concentration falls correspondingly Meanwhile, however, both the thyroid and the kidneys are removing iodide from the plasma that circulates through them We may picture radio iodine, introduced in the form of iodide into the circulation (fig 5) either intravenously or by absorption from the alimentary tract, diffusing into the tissues, and being progressively removed either by the thyroid or the kidneys When the actual rates of renal and thyroid removal are examined, these rates are found to run proportional to the concentration of radio iodide in the plasma at the time

RENAL CLEARANCE

When the renal excretion rate is plotted against plasma radio iodine concentration, the two are found to be directly proportional to each other In a group of subjects so examined (Myant et al 1949a), the kidneys excreted 8% of the dose per hour while the plasma contained 4% per litre, and 6% per hour while the plasma contained 3% per litre, the hourly excretion always amounting in fact to the quantity of radio iodide contained in 2 litres of plasma In other words, as with the familiar renal clearances for such substances as urea or inulin, the kidney clears a constant volume of plasma each hour of the radio iodide it *contains, the* normal kidney clearing about 2 litres of plasma each hour This implies that whatever iodide is present in this volume is also excreted, *since radio iodide is not* distinguishable chemically from normal iodide We have, therefore, a method of estimating the renal clearance of iodide by comparing the rate of urinary radio-iodide excretion with the simultaneous level of its plasma concentration This renal clearance has about the same value in normal subjects and in patients with Graves's disease In different individuals, however, its value varies widely round a mean of 32 ml. of plasma cleared per minute with a standard deviation of 12 ml per minute Since red blood cells are found to take up iodide rapidly to a concentration about two thirds that in the plasma, the plasma clearance of 32 ml per minute is equivalent to the removal of iodide from 37 ml of blood per minute It is of interest that, since the renal blood flow is estimated at about 1200 ml per minute (Goldring et al 1940), the kidney removes the iodide passing through it with an efficiency of about 3% at physiological plasma iodide levels

THYROID CLEARANCE

A thyroid clearance rate for iodide can be estimated in a somewhat similar manner Thus if the counting-rate opposite the neck is plotted, the curve obtained indicates the amount of radio iodine in the thyroid, and the slope of the curve measures the rate at which radio iodine is being accumulated by the gland at any time This rate of uptake is also found to run parallel to the plasma radio iodine concentration in the early hours after the dose and before radio-iodine liberation from the gland, and thyroxine accumulation in the plasma, disturb the proportionality During these hours, therefore, a thyroid clearance can be calculated. For example, suppose that the rate of rise of the neck-

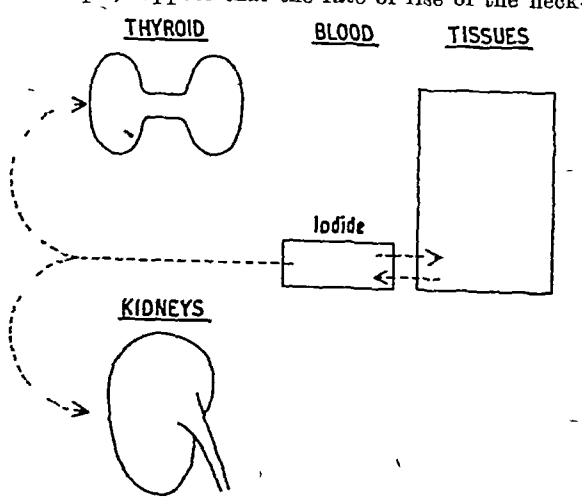

Fig 5—Initial circulation of radio-iodide

count indicates a thyroid uptake rate of 6% of the dose per hour, and that the plasma at the same time contains 4% of the dose per litre It can then be said that the thyroid is clearing 1½ litres of plasma of its radio iodide per hour

Again, since radio iodide is chemically indistinguishable from normal iodide, this clearance rate gives a valid method of sampling thyroid activity at a given level of plasma iodide Moreover, evidence is accumulating that this rate varies little with moderate changes of plasma iodide level within the normal range The thyroid clearance rate for radio iodide therefore appears to measure directly that avidity of thyroid tissue for circulating iodide which is characteristically affected in Graves's disease In thyrotoxic subjects also, the uptake rate is proportional to the plasma concentration, but a much greater volume of plasma is cleared each minute and this is commonly observed even in clinically mild cases of Graves's disease The actual weight of iodide taken up by the thyroid will depend not only on the clearance rate, but also on the plasma iodide concentration (Stanley 1949) The overactive gland, however, removes iodide faster than the normal one from plasma of equal iodide content, and the thyroid clearance rate is the direct measure of this greater avidity

The normal thyroid clears on average 25 ml of plasma per minute As with the renal clearance, the value does not imply that this quantity of plasma is cleared with complete efficiency To investigate the actual efficiency with which the thyroid removes iodide, we have measured, during operations for simple thyroid adenoma, the difference in radio iodine concentration in blood from a thyroid vein and from an arm vein

After a radio iodine dose an hour previously, blood is taken from a vein draining the more normal of the thyroid lobes It is difficult to avoid either stasis in the vein if it is occluded, or withdrawal of blood from proximal veins draining other tissues if occlusion is not used, and very variable results have been obtained in the six cases examined The mean value, however, corresponds to a removal by such thyroid tissue of about 20% of the radio iodide passing through the gland Since the normal clearance is equivalent to 30 ml of whole blood cleared per minute, this figure, if valid for normal tissue, would indicate a thyroid blood flow of the order of 150 ml per minute, or about 6 volumes of blood per volume of tissue per minute

This is a very rough estimate, which could be improved by taking samples from normal glands during operations in adjacent fields For clinical purposes, however, it is the actual uptake of radio iodide, rather than the total offered by the circulation, which is of major interest, and it is this value which is estimated by the thyroid clearance rate We have found the clearance-rate to range from 7 to 42 ml per minute in different normal subjects or patients without thyroid disease In a given subject, the value appears to be relatively constant in successive hours and, for the few cases examined repeatedly, on successive occasions In a series of twelve healthy young adults, the average value was 25 ml per minute and the standard deviation 8 ml per minute On the other hand, in 21 patients diagnosed as having Graves's disease, values have ranged from 85 ml to over 500 ml per minute, with an average value of 240 ml The thyroid clearance is evidently a highly sensitive measure of thyroid over activity compared, for example, with the basal metabolic rate, of which the value is rarely even doubled As a direct and quantitative measure of the thyroid gland's avidity for iodine, it is likely to be a valuable tool in the investigation of Graves's disease, and of the factors—whether in the pituitary or in the patient's environment—which may increase thyroid activity The main interest of this measurement will probably lie in its application to research on the physiology of human thyroid function, and on the mechanism of pathological hyperthyroidism and hypothyroidism

As a diagnostic criterion also, however, it appears to have substantial value, particularly in cases suspected of early or slight thyrotoxicity It is difficult on our two years' experience with the method to define its clinical reliability, especially in the absence of any conclusive and objective measure of thyrotoxicity In our opinion it is more reliable than the basal metabolic rate, and is of clear value in distinguishing the mildly thyrotoxic patient from the subject with anxiety symptoms but without metabolic change, in whom the clearance is found to be normal

The thyroid clearance would be completely reliable as a test of Graves's disease, only if its value were always raised beyond the normal range even in the mildest cases and if no other disease caused a similar rise In view of the differences in clearance rate even between normal subjects, a complete separation could not be expected, but the overlap between the groups may be small enough to give a clinically valuable test We have not examined large series of patients to investigate these points fully, but in all recent tests in which reliable methods of calibration have been used, we have not obtained evidence of overlap between the groups We have not yet observed clearances of over 45 ml. per minute in normal subjects, or of over 65 ml in patients with simple goitre We have not seen values below 80 ml in probable Graves's disease, and most values exceed 100 ml. even in clinically mild cases, or 150 ml in the fully developed disease The highest clearances, however, are not found in patients with the highest basal metabolic rates, nor in those cases which appear to be most severe on clinical grounds, and the clearance rate may correlate with the vascularity of the gland rather than directly with its toxicity These values refer to untreated cases, and the clearance is considerably reduced during therapy either with thiouracil derivatives or with Lugol's iodine in therapeutic dosage In so far as a rapid iodide uptake implies a rapid thyroxine output, the clearance would be expected to give some measure of the degree of thyrotoxicosis If, however, the conversion of iodide to thyroxine is chemically blocked by thiouracil, it cannot be expected that the iodide clearance would continue to measure the level of metabolism The clearance and tests depending on it, cannot therefore be relied on to follow a response to medical treatment

In myxœdema, the uptake of iodide by the thyroid is usually detectable, although it is too small and too slow for accurate determination of the clearance Rough values may be estimated, however, and, for cases in

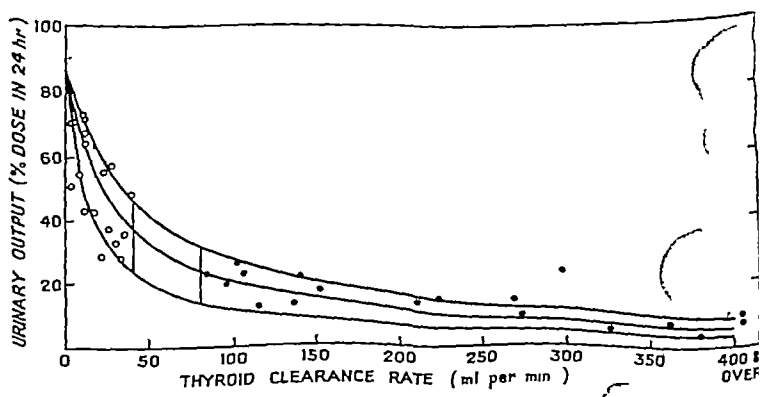

Fig 6—Relation of urinary output of radio-iodide to thyroid clearance rate Curves predicted mean and extreme values as in text. Black discs Graves's disease; open circles no thyroid disease

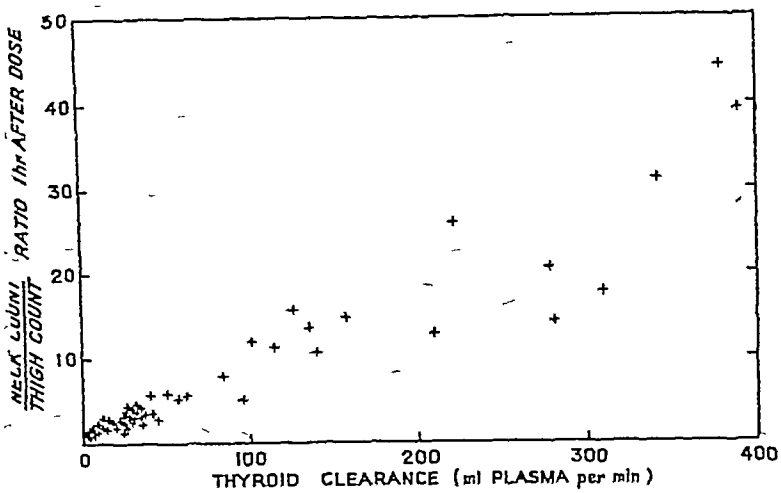

Fig 7—Relation of "neck thigh ratio" to thyroid clearance-rate

which the clinical diagnosis is clear, range from 1 ml. to 4 ml per minute in place of the normal clearance of 25 ml. per minute It is to be expected that the diagnosis of minor degrees of hypothyroidism would be greatly simplified by determination of the thyroid clearance

TESTS OF IODIDE UPTAKE

As a practical measure, determination of the thyroid clearance rate is regarded by the thyrotoxic patient as no more upsetting than determination of the basal metabolic rate, and indeed the former is often preferred. The thyroid clearance test has, moreover, the advantage that, with radio iodide given intravenously, it can be done at any time of day on an outpatient and can be completed within an hour It is undoubtedly rather more complex, however, than determination of the metabolic rate, in respect of equipment, measurements, and calculation, and simpler, if less direct, indices of thyroid uptake have been used or may be suggested Many of these are based on urinary excretion of radio-iodide since, if the thyroid uptake of iodide is increased, the kidney secures a correspondingly smaller share of the test dose The percentage of the radio iodide excreted within 24 hours, or some other given period, will therefore depend partly on the thyroid clearance Many reports have indicated a low excretion in Graves's disease, less than 25% of the dose usually being passed in 24 hours, as compared with over 40% in most normal subjects Unfortunately, as has often been emphasised, an output of about 30% may be obtained from some normal subjects as well as from subjects with clear or suspected Graves's disease While this test commonly gives valuable evidence, therefore, an ambiguous answer may be obtained from those cases of mild Graves's disease in which diagnostic information is most desirable Such overlap between the results is to be expected since the thyroid uptake is inferred from the renal output, and since the renal clearance rate is itself a highly variable factor in different subjects When the 24 hour urinary excretion of radio iodide is plotted against the thyroid clearance in normal and thyrotoxic subjects (fig 6), the urinary excretion is seen to be inversely proportional to the thyroid clearance, but individual points scatter rather widely from a line The central line is that calculated by assuming average values for renal clearance and for the extrathyroid tissue content of radio iodine at 24 hours The boundary lines show the error that would be predicted from the observed variability of these values in different individuals, at the two standard deviation level It will be seen that the points group round the curve within approximately the predicted zone, showing that known causes of variability account for the observed uncertainty of the test based on 24-hour urinary output Moreover, it is clear that a high normal clearance of 40 ml. per minute could, for these reasons alone, be associated with a 24-hour output lower than that which could accompany a low thyrotoxic clearance of 100 ml per minute, showing that overlap would be expected in the zone in which it is observed It appears that, whether or not normal thyroid clearances and those in Graves's disease prove to overlap in value, inferences of thyroid uptake that are based on renal excretion must be subject to a greater degree of overlap, owing largely to the variability of the renal clearance for iodide

The same criticism applies, although with somewhat less force, to tests based on the urinary excretion during an optimal period—for example from 8 to 12 hours after the dose—when the normal output may exceed that in Graves's disease most consistently It will be remembered that the urinary output of radio iodide is determined by the plasma concentration and the renal clearance rate The urinary excretion rate must therefore always be less reliable than the corresponding plasma radio iodide concentration, which gives precisely the same information but without involving the variability of the renal clearance.

Because of this occasional difficulty with the otherwise simple and valuable urinary test, Keating et al (1947) proposed a mathematical analysis of the roughly exponential course of urinary output They suggested that the fall in plasma concentration is due to thyroid and renal removal of iodide If, therefore, the renal contribution to the total were assessed, the thyroid removal of iodide could be estimated by difference This method, has, however, a limitation which its authors have emphasised (Keating and Albert 1949) As we have seen, removal of iodide from the plasma into the extrathyroid tissues is an important additional cause for the fall in plasma concentration for several hours after the dose, and in some cases, by the time this factor becomes unimportant, the fitting of an exponential coëfficient to the remaining urinary excretion may involve substantial uncertainty

For these reasons it is useful to consider other simple measures of thyroid uptake that would correlate closely with the thyroid clearance rate The total radio-iodine uptake of the thyroid is little better than the 24-hour urinary output, from which it clearly differs only by eliminating a small extrathyroid-tissue content, since these three contents, with a negligible fæcal excretion figure, must account for the total dose We have found overlap between normal and thyrotoxic patients at thyroid uptake levels of about 70% of the dose

The theoretical advantage of basing such tests on plasma rather than urine samples has already been mentioned The overactive thyroid in Graves's disease lowers the plasma radio iodine content more rapidly than in normal subjects The normal plasma concentration still exceeds 2% per litre at 2 hours after the dose, but in thyrotoxic subjects lower values have consistently been observed, except in one subject, in whom absorption of an oral dose was delayed (Myant et al. 1950) After 4 hours the normal values are also falling to low levels, while some Graves's disease patients with rapid thyroxine synthesis, have rising curves for total plasma radioactivity, due now to radio-thyroxine If a simple test were required which could be based on liquid counting methods alone, the plasma

concentration at, say, 2 hours after an intravenous dose would repay investigation

An even simpler test of comparable value may be obtained by comparing the count opposite the neck with that opposite the thigh In Graves's disease, the thyroid rapidly takes up radio iodide from that circulating through the rest of the body The thyroid-count therefore becomes abnormally high and the thigh count abnormally low, so that the ratio between the two is greatly increased When the value of this ratio—for example, 1 hour after the dose—is compared with the value of the thyroid clearance in different subjects (fig 7) it is seen that this "neck to thigh ratio," which can be determined in a few minutes, correlates closely with the thyroid clearance, which requires an hour for its estimation The test is convenient for clinical use in other ways it requires only a small radio iodine dose, 8 microcuries (μC) being enough for an estimation, whereas we use 30 μC for a thyroid clearance, and the size of this dose need not be accurately standardised, since the result of the test depends on a ratio between counting rates This test does not involve blood samples or the collection of urine specimens, and the result may be known within an hour of first seeing the patient At the same time it is more liable than the thyroid clearance rate to be disturbed by extraneous factors, such as thigh size, thyroid position relative to the counter, and variability in the delay of radio iodide absorption from the stomach if the dose is given orally, and the dose should therefore be given to a fasting patient or by intravenous injection Under these circumstances the test gives, within a few minutes, information which appears to be of considerable diagnostic value in cases suspected of thyroid overactivity

It appears, therefore, that several simple if indirect measures of the thyroid's avidity for iodine may be derived from measurements of urinary, plasma, or external body counting rates Where such tests are used in the diagnosis of hyperthyroidism and give an equivocal result, the thyroid clearance rate is more likely to be conclusive, since it measures this rate of iodide uptake directly And in so far as the rate of iodide uptake corresponds to the rate of output and utilisation of thyroxine, the thyroid clearance rate should measure the state of the body thyroxine metabolism More direct information on the thyroxine phase of the iodine cycle can, however, be obtained with radio iodine and by considering the circulation of radio iodine through the body, and its acceleration in Graves's disease

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Potassium dihydrogen phosphate	0 5 g
Dipotassium hydrogen phosphate	5·0 g
Water to	1000 ml

pH adjusted to 7 5

As a result of precipitation of phosphates occurring during heating, the concentrations of iron, magnesium, and phosphate in the medium used were considerably lower than stated in the formula

The strain of *Bact coli* used in the investigation grew rapidly and well in this medium, but, for reasons which will be dealt with in another paper, 'Lab Lemco' was added to the medium to give a final concentration of 1 in 20,000

The substance or substances under investigation were dissolved in the medium, the pH of which, after the addition, was in all cases adjusted to 7 5 Serial dilutions were made in 5 ml volumes of the medium contained in small bottles covered with loosely fitting aluminium cap

Bottles were inoculated by adding to each one drop from a Dreyer pipette of a suitable dilution in buffered saline of a 24 hour culture of the organism grown in the medium The bottles were incubated at 37° and were examined daily for 3 days The naked eye appearance of the medium was recorded as

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No great accuracy is claimed for this method of estimating the number of living bacteria in a culture but it has the advantage over other methods of economy of time, material, and apparatus It is of considerable value to be able to estimate, even if without a high degree of accuracy, the number of living bacteria in a culture which may contain up to several million living bacteria per millilitre without detectable loss of clarity

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Synergism should be distinguished from the potentia on which a substance which is not itself antibacterial ay exercise on an antibacterial one

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RESULTS

The investigation was confined to a study of ix substances—sulphathiazole, penicillin, streptomycin,

TABLE I

Sulphathiazole (mg per 100 ml)	Penicillin (units per ml.) 64	16	4	1	0
4	0	0	0	1	0
1	0	0	14	10	16
1/4	0	0	80	85	95
1/16	0	20	—	—	—
1/64	0	200	TT	TT	TT
0	0	TT	TT	TT	TT

Initial count—24
Incubation—22 hours

'Chloromycetin' (chloramphenicol) boric acid, and the sodium salt of *p* aminosalicylic acid—acting in pairs in Lemco synthetic medium on *Bact coli*

It is unnecessary to state in detail the results given by the fifteen combinations a few examples will suffice. The method of presentation is illustrated in table I, which shows the synergistic action of penicillin and sulphathiazole. The bottles of Lemco synthetic medium, containing penicillin or sulphathiazole, or both, in the concentrations shown, were so inoculated that each gave 24 colonies per loop After incubation for 22 hours, one loopful of each was spread over an agar slope The number of colonies which developed on incubation are recorded in the table

The bottom line gives the number of bacteria which survived the action of penicillin alone in the concentrations shown in the top line The right-hand column

TABLE II

Sulphathiazole (mg per 100 ml)	Streptomycin (mg per 100 ml.) 2	1/2	1/8	1/16	0
8	0	0	0	0	0
2	0	0	0	0	1
1/2	0	0	0	3	6
1/8	0	0	1	75	+
1/32	0	0	2	—	+ —
0	0	7	TT	TT	TT

Initial count—28
Incubation—47 hours

TABLE III

Sulphathiazole (mg per 100 ml)	Chloromycetin (mg per 100 ml.) 1	1/2	1/4	1/8	0
16	0	1	8	0	0
4	0	1	15	0	0
1	0	6	40	0	1
1/4	0	5	23	70	65
1/16	0	1	20	200	300
1/64	0	1	110	+	+
0	0	4	— —	T	TT

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TABLE IV

Sulphathiazole (mg per 100 ml)	Boric acid (%) 2	1	1/2	1/4	1/8	0
4	0	0	3	150	15	0
1	0	1	4	230	85	5
1/4	0	0	4	+	300	110
1/16	0	2	5	T	T	—
0	0	1	4	T	TT	TT

Initial count—25
Incubation—46 hours

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Table VII shows the results obtained when solutions of ilphathiazole and of *p* aminosalicylic acid were succes vely diluted separately and together in the culture iedium

The results obtained with mixtures of the two sub ances show some differences from those obtained with nixtures of boric acid and sulphathiazole At high con- entrations of P A S (from 2 to $^1/_2$%) and sulphathiazole rom 16 to 4 mg per 100 ml) the former is antagonistic o the latter At low concentrations of the two (from $^1/_{32}$% P A S and $^1/_4$ mg sulphathiazole per 100 ml ownwards) the two act synergistically Unlike boric cid, P A S exercises some effect in concentrations too ow to enable its direct antibacterial effect to be demon- trated This might obviously be of considerable importance in therapeutics , but, for our present purpose, the importance of this experiment is that it proves that the antagonism of *p* aminosalicylic acid to sulphathiazole is physiological and not chemical.

Table VIII summarises the findings in this investigation It is so arranged that, when we wish to know what action one substance has on another, we trace the column under the name of the first substance downwards The action is shown where the column intersects the line extending from the name of the second substance. For example, sulphathiazole acts synergistically with *p* aminosalicylic acid, where *p* aminosalicylic acid may act either antagonistically to or synergistically with sulpha thiazole

In fourteen of the fifteen combinations, synergism—which must, as has already been explained, be mutual—was demonstrated In few, however, were its effects as marked or as permanent as in the examples illustrated in tables I and II

In two cases of antagonism (chloromycetin to sulpha thiazole and *p* aminosalicylic acid to streptomycin), the antagonism which was obvious for the first day or two was replaced by synergism within three days In three cases (boric acid to sulphathiazole, boric acid to penicillin, and *p* aminosalicylic acid to sulphathiazole) the antagon- ism, which was strong, appeared also to be permanent In two of three cases it was possible to demonstrate

TABLE VII

Sulphathiazole (mg per 100 ml)	Sulphathiazole	Sulpha thiazole + *p*-amino salicylic acid	*p* Amino-salicylic acid	*p* Aminosalicylic acid (%)
32	0	0	0	4
16	0	300	+	2
8	0	200	+	1
4	0	10	+	1/2
2	0	1	+	1/4
1	0	4	+	1/8
1/2	0	32	+	1/16
1/4	180	35	+	1/32
1/8	+	57	++	1/64
1/16	+	130	++	1/128
1/32	—	170	++	1/256

Initial count—39
Incubation—47 hours

TABLE VIII

—	Sulphathiazole	Penicillin	Streptomycin	Chloromycetin	Boric acid	*p* Aminosalicylic acid
Sulphathiazole	—	S	S	A S	A	A S
Penicillin	S	—	S	S	A S	S
Streptomycin	S	S	—	S	S	A S
Chloromycetin	S	S	S	—	S	S
Boric acid	A	S	S	S	—	S
p Aminosalicylic acid	S	S	S	S	S	—

To be read downwards not across
A = Antagonism
S = Synergism

synergism at the same time as antagonism, although not in very marked form and over rather narrow ranges of concentrations which, of course, differed from those showing antagonism In only one case (boric acid and sulphathiazole) was antagonism strong, mutual, and permanent

DISCUSSION

There is no great difficulty in advancing hypotheses to explain synergism If the two substances interfere with the same constituent, cellular structure or metabolic process, they might be expected, in combination, to display an additive effect such as would be secured by increasing the concentration of one or other of the substances If, however, the point of attack is different, such organisms as had survived the action of the first substance would become exposed to that of the second and, if susceptible to it, would succumb In this case much more than a merely additive effect might result

Antagonism is much more difficult to explain There may be some significance in the fact that, in the three examples of marked and permanent antagonism dis covered, the antagoniser was either boric acid or *p* amino salicylic acid, both markedly bacteriofrenic substances * and the substance against which antagonism was dis played was either sulphathiazole or penicillin, slowly acting antibacterial substances, permitting, if not requiring, bacteria susceptible to their action to multiply for several generations before being affected by them It is suggested that, either as a result of or in association with the slowing down of the rate of bacterial multiplica- tion for which the bacteriofrene is responsible, some alteration in the cellular structure or metabolic processes of the bacteria occurs As a result of this alteration, the other substance is either prevented from entering the cell or, having entered it, is unable to act in the manner which, in a normal cell, is responsible for its death

Apart from their theoretical interest and the light they may throw on the mode of action of antibacterial sub stances, are the examples of antagonism and synergism which have been discovered of any practical importance ?

As regards synergism, it should be of value to know whether two antibacterial drugs may be administered simultaneously By the combination of two, it may be possible to obtain the required effect with a dosage of one which, if it alone were used, would be insufficient but which, in higher dosage, would have undesirable side-effects A more important advantage of using two drugs in place of one is the probability that this procedure would tend to prevent the multiplication of mutants resistant to one of the drugs That this is not merely a theoretical advantage is shown by the successful use of *p*-aminosalicylic acid in preventing the develop ment of resistant strains of *Mycobacterium tuberculosis*

* See note at end of article

TABLE V

Boric acid (%)	Boric acid	Boric acid + sulphathiazole	Sulphathiazole	Sulphathiazole (mg per 100 ml.)
2	0	0	0	128
1	0	0	0	64
1/2	2	11	0	32
1/4	T	50	0	16
1/8	TT	7	0	8
1/16	TT	0	0	4
1/32	TT	0	0	2
1/64	TT	1	1	1
1/128	TT	28	5	1/2
1/256	TT	48	18	1/4
1/512	TT	100	45	1/8
1/1024	TT	200	+	1/16
1/2048	TT	+	+	1/32

Initial count—26
Incubation—44 hours

$^1/_4$ and $^1/_8$% together with sulphathiazole in concentrations falling from 4 to $^1/_{16}$ mg per 100 ml, yielded much higher counts than did the same concentrations of sulphathiazole acting alone Since the presence of boric acid reduced the antibacterial action of sulphathiazole, boric acid is antagonistic to sulphathiazole This table does not show any combination in which the presence of sulphathiazole reduced the antibacterial action of boric acid, and, if this were the only experiment in which the interaction of the two substances had been investigated, we would be forced to conclude that, while boric acid is antagonistic to sulphathiazole, sulphathiazole is not antagonistic to boric acid In the next table, however, there is one point at which definite, although not pronounced, antagonism of sulphathiazole to boric acid is shown, and other experiments prove that such antagonism exists So, in the case of boric acid and sulphathiazole, the antagonism is mutual, although that of boric acid against sulphathiazole is much greater than is that of sulphathiazole against boric acid In all the fifteen combinations studied, this is the only example of mutual antagonism encountered In all other cases of antagonism, one substance was antagonistic to the second but the second was not antagonistic to the first The interaction of boric acid and sulphathiazole is unique in another respect Despite many experiments in which the two substances were combined in various proportions, no instance of synergism was observed In all other cases where antagonism was demonstrated, synergism could also be demonstrated when the two substances were present in different proportions

It is not difficult to think of two antibacterial substances which, when acting together in suitable proportions, would be devoid of antibacterial properties One could, for example, render broth so acid by the addition of hydrochloric acid and so alkaline by the addition of sodium hydroxide that, in either case, bacteria introduced would be rapidly killed The addition of the two substances together to broth would produce sodium chloride and water, neither of which has antibacterial properties Dilution of the combination would not, therefore, yield a product possessing such properties Hydrochloric acid and sodium hydroxide would appear to be antagonistic, but their antagonism is chemical and not physiological and might better be described as incompatibility

Is the basis of the antagonism of boric acid to sulphathiazole chemical or physiological? An experiment, the results of which are shown in table v, was devised to answer this question

Solutions of boric acid, of sulphathiazole, and of the two together in the same concentrations as in the separate solutions, were made in the medium The three solutions were diluted in the usual way in the medium, inoculated equally with *Bact coli*, and incubated for 44 hours, at the end of which period the number of living bacteria present was determined

The results with boric acid are shown in the left hand column and the results with sulphathiazole in the right hand column The middle column shows the results with the mixture of the two At any level in the middle column, the concentration of boric acid present is the same as at the same level in the left hand column and of sulphathiazole the same as at the same level in the right hand column

The results with boric acid alone and with sulphathiazole alone require no comment, but those given by the two together appear, at first sight, devoid of any pattern Closer consideration, however, shows that they are capable of logical explanation The first two zeros were due to the bactericidal action of boric acid in high concentration The next count, 11, which is higher than that given by the same concentrations of boric acid and sulphathiazole separately, was due to the mutual antagonism of the two The next two counts, 50 and 7, which are higher than the corresponding counts given by sulphathiazole alone but lower than those for boric acid alone, were due to the antagonism of boric acid to sulphathiazole The two zeros following are due to the bactericidal action of sulphathiazole uninfluenced by

TABLE VI

Sulphathiazole (mg per 100 ml)	p Aminosalicylic acid (%) 8	2	1/4	1/8	0
4	0	++	1	0	0
1	0	++	90	3	[illegible]
1/4	0	++	++	260	[illegible]
1/16	0	++	++	++	+
0	0	++	++	T	TT

Initial count—19
Incubation—46 hours

boric acid which, at these levels ($^1/_{16}$ and $^1/_{32}$%), was in too low concentration to exercise any antagonistic effect Subsequent counts are not significantly different from the corresponding results with sulphathiazole alone

This experiment presents a curious paradox. It is possible to prepare in a culture medium a mixture of two antibacterial substances, such as $^1/_4$% boric acid and 16 mg sulphathiazole per 100 ml, which is more effective in killing bacteria when diluted 1 in 8 than it is when undiluted The chief importance of the experiment, however, is that it proves that the antibacterial action of sulphathiazole was not significantly altered by having been in contact for some time with boric acid The antagonism of boric acid to sulphathiazole is, therefore, physiological and not chemical

The most striking example of antagonism encountered in the investigation was that of *p* aminosalicylic acid (P A S) to sulphathiazole which is shown in table VI P A S in a concentration of 2% was antagonistic to sulphathiazole in concentrations ranging from 4 to $^1/_{16}$ mg per 100 ml At lower concentrations of P A S, its range of antagonism to sulphathiazole was reduced, but even at $^1/_8$% its antagonism was marked The fact that the count with, for example, $^1/_4$% P A S and 1 mg sulphathiazole per 100 ml was lower than with $^1/_4$% P A S alone, does not entitle us to state that sulphathiazole

s synergistically with P A S , for synergism, according he definition, requires the combination to give a lower ınt than is given by each of the two substances acting ne, and this was not the finding in this experiment ɔm the data presented in this table we cannot conclude ıt sulphathiazole and P A S act synergistically , but it ppens that the next table presents a convincing monstration of synergism between the two

Table VII shows the results obtained when solutions of ıphathiazole and of *p* aminosalicylic acid were succes- ·ely diluted separately and together in the culture ·dium

The results obtained with mixtures of the two sub ınces show some differences from those obtained with ıxtures of boric acid and sulphathiazole At high con ntrations of P A S (from 2 to ½%) and sulphathiazole ·om 16 to 4 mg per 100 ml) the former is antagonistic the latter At low concentrations of the two (from ½% P.A S and ¼ mg sulphathiazole per 100 ml ɔwnwards) the two act synergistically Unlike boric ıd, P A S exercises some effect in concentrations too w to enable its direct antibacterial effect to be demon rated This might obviously be of considerable nportance in therapeutics , but, for our present purpose, ıe importance of this experiment is that it proves that ıe antagonism of *p* aminosalicylic acid to sulphathiazole ; physiological and not chemical.

Table VIII summarises the findings in this investigation t is so arranged that, when we wish to know what action ne substance has on another, we trace the column under he name of the first substance downwards The action s shown where the column intersects the line extending rom the name of the second substance. For example, ulphathiazole acts synergistically with *p* aminosalicylic ıcid, where *p* aminosalicylic acid may act either ıntagonistically to or synergistically with sulpha- hiazole

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TABLE VII

Sulphathiazole (mg per 100 ml)	Sulphathiazole	Sulphathiazole + p-aminosalicylic acid	p Amino salicylic acid	p Aminosalicylic acid (%)
32	0	0	0	4
16	0	300	+	2
8	0	200	+	1
4	0	10	+	1/2
2	0	1	—	1/4
1	0	4	+	1/8
1/2	0	32	+	1/16
1/4	180	30	+	1/32
1/8	+	57	++	1/64
1/16	—	130	++	1/128
1/32	—	170	++	1/256

Initial count—39
Incubation—4" hours

TABLE VIII

—	Sulphathiazole	Penicillin	Streptomycin	Chloromycetin	Boric acid	p Aminosalicylic acid
Sulphathiazole	—	S	S	A S	A	A S
Penicillin	S	—	S	S	A S	S
Streptomycin	S	S	—	S	S	A S
Chloromycetin	S	S	S	—	S	S
Boric acid	A	S	S	S	—	S
p Aminosalicylic acid	S	S	S	S	S	—

To be read downwards not across
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Antagonism is much more difficult to explain There may be some significance in the fact that, in the three examples of marked and permanent antagonism dis covered, the antagoniser was either boric acid or *p* amino salicylic acid, both markedly bacteriofrenic substances,* and the substance against which antagonism was dis played was either sulphathiazole or penicillin, slowly acting antibacterial substances, permitting, if not requiring, bacteria susceptible to their action to multiply for several generations before being affected by them It is suggested that, either as a result of or in association with the slowing down of the rate of bacterial multiplication for which the bacteriofrene is responsible, some alteration in the cellular structure or metabolic processes of the bacteria occurs As a result of this alteration, the other substance is either prevented from entering the cell or, having entered it, is unable to act in the manner which, in a normal cell, is responsible for its death

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in the body of a patient undergoing treatment with streptomycin

As regards antagonism, it is improbable that boric acid would ever be prescribed for systemic treatment in such a dose as to render its antagonism to sulphathiazole or penicillin dangerous This is not so, however, of local applications or of solutions introduced into cavities The danger may not be very great, but caution suggests the inadvisability of combining in any form boric acid with sulphonamides or with penicillin The antagonisms of chloromycetin to sulphathiazole and of *p* aminosalicylic acid to streptomycin are weak and transient and are, therefore, not likely to be of importance The antagonism of *p* aminosalicylic acid to sulphathiazole, which is strong and permanent, requires serious consideration This antagonism, as table VI shows, occurs in its most marked form with 2% P A S When the concentration of P A S is reduced to $^1/_8$% antagonism is scarcely demonstrable It will be seen from table VII that, when the concentration of P A S is lowered to $^1/_{32}$% or less, it behaves synergistically with sulphathiazole The maximum concentration of P A S attainable in the human body is considerably less than $^1/_{32}$%, and there is therefore no possibility of antagonism between P A S and sulphathiazole occurring during treatment of a patient

My general conclusion is that, as regards the six substances investigated, the synergism which, with a single exception, occurs between them might be of considerable value and the antagonism which has been demonstrated in a few cases is very unlikely ever to represent a real danger

SUMMARY

1 The antibacterial action of six substances—sulphathiazole, penicillin, streptomycin, chloromycetin, boric acid, and *p* aminosalicylic acid—acting in pairs on *Bact coli* in a synthetic medium was studied

2 Synergism was demonstrated in the case of every combination except one

3 Antagonism was demonstrated in the case of five combinations In only three cases was it marked and permanent, and in only one of these (boric acid and sulphathiazole) was each substance antagonistic to the other

4 The theoretical and practical importance of the findings are discussed

NOTE

The words bacteriofrene and bacteriofrenic which are used in this paper are neologs They are derived from the modern Latin *bacterium* and the classic Latin *freno*—I bridle, curb, restrain, or check. A bacteriofrene is a substance which restrains the multiplication of bacteria This word is advanced as it more accurately represents the action of many substances which have hitherto been described as bacteriostatic No chemical substance is known which, in the presence of a culture medium, and under conditions suitable for their growth, holds the number of bacteria constant, and therefore no substance can strictly be said to have a bacteriostatic action Many substances, including boric acid, and *p* aminosalicylic acid, to which the term is applied in this paper, have a bacteriofrenic action

It is a pleasure to record the great help given to me in this investigation by Mr George Ware, B A, and to thank the Medical Research Council of Ireland for a grant to him which enabled me to avail myself of his valuable services I thank also my colleagues and the staff of my department for all their assistance

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EPHEDRINE IN A SCREENING TEST FOR CORTISONE SUBSTITUTES

DENIS ABELSON M.B Lond, M.R C P, E N MOYES M B Edin, M.R C.P.E

From the Brompton Hospital, London

THERE is evidence that adrenaline influences the pituitary adrenocortical system by

(1) Stimulation of the anterior pituitary (Recant et al 1948, Long and Fry 1945)
(2) Direct stimulation of the adrenal cortex (Vogt 1943 1944, 1945)
(3) Both these mechanisms (Speirs and Meyer 1949)

Adrenocorticotropic hormone (A C T H) stimulates the production of glucocorticoids from the adrenal cortex (Mason et al 1948) Now adrenaline, A C T.H. and

TABLE I

Case no	Eosinophils per c mm before and after distilled water				Maximum variation (% of initial count)
	Initial	2 hr	4 hr	6 hr	
22	266	194	205	245	−9
28	192	156	139	139	−25
26	213	192	180	161	−9
29	151	137	128	138	−15
30	213	151	152	157	−29
31	113	101	108	111	−11
32	152	130	120	143	−9
33	180	188	194	208	+13
34	148	117	137	139	−9
37	406	439	330	352	−19
38	248	185	173	232	−30
39	142	127	146	122	−14
40	348	296	290	356	−1
Range	113 to 406	101 to 439	108 to 330	111 to 352	+13 to −30
Mean	213	186	177	192	−19

'Cortisone' (a glucocorticoid) all produce eosinopenia when injected into normal people (Forsham et al 1949 Recant et al. 1948, Thorn and Bayles 1949) In patients with Addison's disease glucocorticoids will still produce eosinopenia whereas adrenaline and A C T.H will not This suggests that the eosinopenia following the administration of adrenaline or A C T H results from the liberation of glucocorticoids from the adrenal cortex.

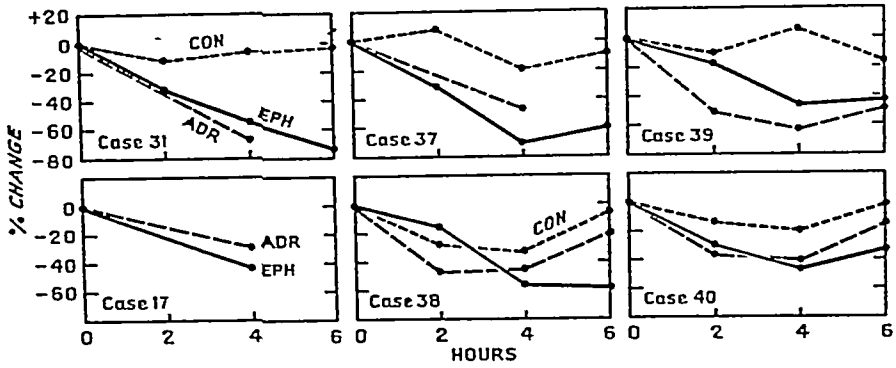
This action on the eosinophils has been used (1) as a check on the activity of A C T H during therapeutic trials, (2) as a measure of adrenal cortical function in the diagnosis of Addison's disease, and (3) as a screening test for substances suspected of having A C T H like

TABLE II

Case no	Eosinophils per c mm before and after adrenaline		Variation (%)
	Initial	4 hr	
4	481	206	−57
7	314	202	−36
8	420	206	−51
11	486	277	−43
14	403	188	−53
16	497	308	−38
17	686	511	−26
19	316	252	−20
20	691	453	−34
15	400	231	−42
21	327	155	−53
35	101	103	+2
31	136	51	−63
32	107	100	−7
33	197	131	−34
34	114	90	−21
35	233	124	−47
36	110	24	−78
37	352	194	−45
38	218	123	−44
39	155	57	−63
40	355	203	−43
Range	101 to 691	24 to 511	+2 to −78
Mean	323	190	−41

ivity (Spies and Stone 1949) e processes involved in the uction of circulating eosino ils are not known

We decided to study this effect adrenaline further and compare with that of ephedrine Ephe ine was chosen because its armacological action is similar that of adrenaline and con ued administration to patients ould be easier because the effects each dose last longer and cause it is active by mouth It is obvious that a substance hich causes eosinopenia will ot necessarily behave in other spects like cortisone, and con rsely a substance which does not produce eosinopenia not necessarily devoid of these properties.



Changes in eosinophil-counts in 6 subjects after an injection of distilled water (con) or adrenaline (adr), or an oral dose of ephedrine (eph)

METHOD

The subjects were inpatients with pulmonary tuberculosis in a fairly static condition, afebrile, and either waiting or undergoing collapse therapy For twelve ours beforehand, and during the test, they remained n bed, and took only water by mouth On the morning f the test, an initial eosinophil-count was performed mmediately afterwards the test substance was adminis ered, and counts were then made every two or four hours ntil the completion of the test

Oxalated venous blood was used for all determinations, hich were made by Dunger s direct method with eosin (see Forsham et al 1948, and for the statistical aspects Discombe 1946) except that blood was drawn to the 1 mark in the white ell pipette, instead of the 0-5 mark, giving a dilution of 1 in 10 At first, two pipettes and four double-cell Neubauer hæmocytometers were used for each determination (one pipette being used to fill four cells) The eosinophils in 8 arge squares of each cell were computed (i.e, a total of 64 squares or 6 4 c mm., equivalent to 0 64 c.mm of blood) The accuracy of this method varies with the square root of the number of cells counted, and the error in enumerating small numbers of cells was found to be large We later used four pipettes and four double-cell Fuchs Rosenthal counting chambers (i.e., a total of 25 6 c mm, equivalent to 2 56 c.mm of blood), and this modification gave more consistent results.

Each of 22 subjects received 5 minims of 1 in 1000 adrenaline subcutaneously From these, 6 subjects were selected, in most of whom the eosinopenia following adrenaline was pronounced, and these on another occasion were given ephedrine gr 1 (except case 17, who received gr ½) by mouth As controls, on another day, 13 subjects (including 5 of the 6 subjects mentioned above) were each given 5 minims of sterile distilled water subcutaneously

Note—Records of eosinophil counts should give details of the method of counting used, for minor variations in technique may lead to misleading results In carrying out this screening test it is also highly desirable to make observations on several subjects, each of whom should be given, on different occasions, the standard substance (in this case adrenaline), an inert material as a control (e g, distilled water), and the test substance (in this case ephedrine)

RESULTS

Distilled Water—Under basal conditions, the eosinophil counts of the 13 controls, over six hours, ranged from + 13% to — 30% of the initial level (table I)

Adrenaline—After 5 minims of 1 in 1000 adrenaline subcutaneously, the eosinophil counts of the 22 subjects at four hours ranged from + 2% to — 78% (table II) This response seems too variable to be useful in the diagnosis of Addison's disease, but the contrary view is expressed by Thorn and Forsham (1949) The discrepancy may be attributable to the fact that the volunteers on which our observations were made were not normal healthy people

Ephedrine—In the dosage used, ephedrine caused a significant eosinopenia (varying from — 41% to — 71%) in all 6 subjects tested The findings in these subjects after the three different injections, are compared in the figure and in table III

TABLE III—EOSINOPHIL-COUNTS IN 6 SUBJECTS AFTER SUBCUTANEOUS INJECTIONS OF DISTILLED WATER (CONTROLS) AND OF ADRENALINE (5 MINIMS OF 1 IN 1000) AND SINGLE DOSES OF EPHEDRINE BY MOUTH

Case no	Drug	Eosinophils per c.mm				Change (% of initial level)			
		Initial	2 hr	4 hr	6 hr	2 hr	4 hr	6 hr	Max
31	Control	113	101	108	111	−11	−4	−2	−11
	Adrenaline	136		51			−63		−63
	Ephedrine gr 1	121	84	54	42	−31	−55	−65	−65
17	Adrenaline	686		511			−26		−26
	Ephedrine gr ½	603		355			−41		−41
37	Control	406	439	330	352	+8	−19	−13	−19
	Adrenaline	352		194			−45		−45
	Ephedrine gr 1	391	266	111	165	−32	−72	−58	−72
38	Control	248	185	173	232	−25	−30	−6	−30
	Adrenaline	218	118	123	168	−46	−44	−23	−46
	Ephedrine gr 1	224	184	103	100	−18	−54	−55	−55
39	Control	142	127	146	122	−11	+3	−14	−14
	Adrenaline	155	79	57	81	−49	−63	−48	−63
	Ephedrine gr 1	149	128	80	87	−14	−46	−42	−46
40	Control	348	296	290	356	−15	−17	+2	−17
	Adrenaline	355	224	203	301	−37	−43	−15	−43
	Ephedrine gr 1	376	269	198	245	−28	−47	−35	−47

The differences between the adrenaline and ephedrine figures and the controls (last column) were analysed by means of Student s t test Case 17 was excluded because control figures were not available The adrenaline and ephedrine figures both differ significantly from the controls the values of P being less than 0 01 in each case

in the body of a patient undergoing treatment with streptomycin

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4 The theoretical and practical importance of the findings are discussed

NOTE

The words bacteriofrene and bacteriofrenic which are used in this paper are neologs They are derived from the modern Latin *bacterium* and the classic Latin *freno*—I bridle, curb, restrain, or check. A bacteriofrene is a substance which restrains the multiplication of bacteria This word is advanced as it more accurately represents the action of many substances which have hitherto been described as bacteriostatic No chemical substance is known which, in the presence of a culture medium, and under conditions suitable for their growth, holds the number of bacteria constant, and therefore no substance can strictly be said to have a bacteriostatic action Many substances, including boric acid, and *p* aminosalicylic acid, to which the term is applied in this paper, have a bacteriofrenic action

It is a pleasure to record the great help given to me in this investigation by Mr George Ware, B A, and to thank the Medical Research Council of Ireland for a grant to him which enabled me to avail myself of his valuable services I thank also my colleagues and the staff of my department for all their assistance

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EPHEDRINE IN A SCREENING TEST FOR CORTISONE SUBSTITUTES

DENIS ABELSON M B Lond, M R C.P, E N MOYES M B Edin, M.R.C.P.E

From the Brompton Hospital, London

THERE is evidence that adrenaline influences pituitary adrenocortical system by

(1) Stimulation of the anterior pituitary (Recant et al 1948, Long and Fry 1945)
(2) Direct stimulation of the adrenal cortex (Vogt 1944, 1945)
(3) Both these mechanisms (Speirs and Meyer 1949).

Adrenocorticotropic hormone (A C T H) stimulates production of glucocorticoids from the adrenal cortex (Mason et al 1948) Now adrenaline, A C T H

TABLE I

Case no	Eosinophils per c mm before and after distilled water				Maximum variation (% of initial count)
	Initial	2 hr	4 hr	6 hr	
22	266	194	205	245	-47
28	192	156	139	139	-26
26	213	192	180	101	-41
29	151	137	128	138	-15
30	213	151	152	157	-28
31	113	101	108	111	-11
32	152	130	120	143	-21
33	180	188	194	203	+13
34	148	117	137	139	-21
37	406	439	330	352	-19
38	248	185	173	232	-37
39	142	127	146	122	-14
40	348	296	290	356	-17
Range	113 to 406	101 to 439	108 to 330	111 to 35°	+13 to -[illegible]
Mean	213	186	177	192	-19

'Cortisone' (a glucocorticoid) all produce eosinopenia when injected into normal people (Forsham et al 1949 Recant et al 1948, Thorn and Bayles 1949) In patients with Addison's disease glucocorticoids will still produce eosinopenia whereas adrenaline and A C T H will not This suggests that the eosinopenia following the administration of adrenaline or A C T H results from the liberation of glucocorticoids from the adrenal cortex

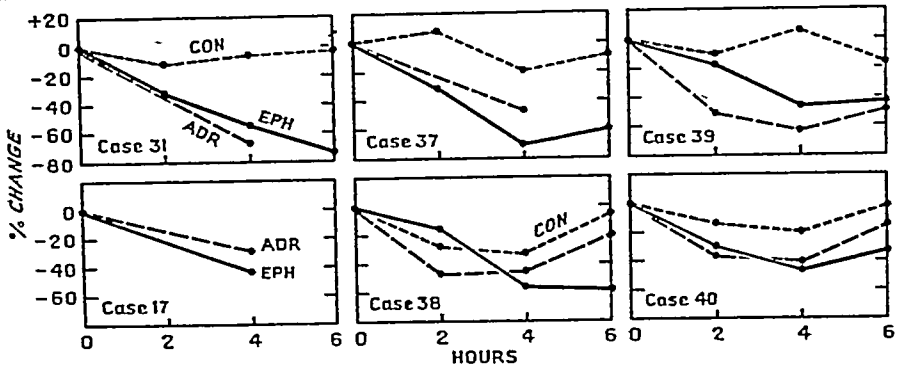
This action on the eosinophils has been used (1) as a check on the activity of A C T H during therapeutic trials, (2) as a measure of adrenal cortical function in the diagnosis of Addison's disease, and (3) as a screening test for substances suspected of having A C T H like

TABLE II

Case no	Eosinophils per c mm before and after adrenaline		Variation (%)
	Initial	4 hr	
4	481	206	-57
7	314	202	-36
8	420	206	-51
11	486	277	-43
14	403	188	-53
16	497	308	-38
17	686	511	-26
19	316	252	-20
20	691	453	-34
15	400	231	-42
21	327	156	-53
35	101	103	+ 2
31	136	51	-63
32	107	100	- 7
33	197	131	-34
34	114	90	-21
35	233	124	-47
36	110	24	-78
37	352	194	-45
38	218	123	-44
39	155	57	-63
40	355	203	-43
Range	101 to 691	24 to 511	+ 2 to - 78
Mean	323	190	-41

vity (Spies and Stone 1949) processes involved in the action of circulating eosino s are not known

We decided to study this effect drenaline further and compare with that of ephedrine Ephe ne was chosen because its rmacological action is similar that of adrenaline and con- ued administration to patients uld be easier because the effects each dose last longer and ause it is active by mouth t is obvious that a substance ich causes eosinopenia will t necessarily behave in other pects like cortisone, and con rely a substance which does not produce eosinopenia not necessarily devoid of these properties



Changes in eosinophil-counts in 6 subjects after an injection of distilled water (con) or adrenaline (adr), or an oral dose of ephedrine (eph).

METHOD

The subjects were inpatients with pulmonary tuberculosis in a fairly static condition, afebrile, and either waiting or undergoing collapse therapy For twelve hours beforehand, and during the test, they remained in bed, and took only water by mouth. On the morning of the test, an initial eosinophil count was performed immediately afterwards the test substance was administered, and counts were then made every two or four hours until the completion of the test

Oxalated venous blood was used for all determinations, which were made by Dunger's direct method with eosin (see Forsham et al 1948, and for the statistical aspects Discombe 1946), except that blood was drawn to the 1 mark in the white cell pipette, instead of the 0·5 mark, giving a dilution of 1 in 20 At first, two pipettes and four double-cell Neubauer haemocytometers were used for each determination (one pipette being used to fill four cells) The eosinophils in 8 large squares of each cell were computed (i.e, a total of 64 squares or 6 4 c.mm., equivalent to 0·64 c mm of blood) The accuracy of this method varies with the square root of the number of cells counted, and the error in enumerating small numbers of cells was found to be large We later used four pipettes and four double-cell Fuchs Rosenthal counting chambers (i.e., a total of 25 6 c mm, equivalent to 2 56 c.mm of blood), and this modification gave more consistent results

Each of 22 subjects received 5 minims of 1 in 1000 adrenaline subcutaneously From these, 6 subjects were selected, in most of whom the eosinopenia following adrenaline was pronounced, and these on another occasion were given ephedrine gr 1 (except case 17, who received gr $^1/_2$) by mouth As controls, on another day, 13 subjects (including 5 of the 6 subjects mentioned above) were each given 5 minims of sterile distilled water subcutaneously

Note—Records of eosinophil counts should give details of the method of counting used, for minor variations in technique may lead to misleading results In carrying out this screening test it is also highly desirable to make observations on several subjects, each of whom should be given, on different occasions, the standard substance (in this case adrenaline), an inert material as a control (e g, distilled water), and the test substance (in this case ephedrine)

RESULTS

Distilled Water—Under basal conditions, the eosinophil-counts of the 13 controls, over six hours, ranged from + 13% to — 30% of the initial level (table I)

Adrenaline—After 5 minims of 1 in 1000 adrenaline subcutaneously, the eosinophil counts of the 22 subjects at four hours ranged from + 2% to — 78% (table II) This response seems too variable to be useful in the diagnosis of Addison's disease, but the contrary view is expressed by Thorn and Forsham (1949) The discrepancy may be attributable to the fact that the volunteers on which our observations were made were not normal healthy people

Ephedrine—In the dosage used, ephedrine caused a significant eosinopenia (varying from — 41% to — 71%) in all 6 subjects tested. The findings in these subjects after the three different injections, are compared in the figure and in table III

TABLE III—EOSINOPHIL-COUNTS IN 6 SUBJECTS AFTER SUBCUTANEOUS INJECTIONS OF DISTILLED WATER (CONTROLS) AND OF ADRENALINE (5 MINIMS OF 1 IN 1000) AND SINGLE DOSES OF EPHEDRINE BY MOUTH

Case no	Drug	Eosinophils per c.mm				Change (% of initial level)			
		Initial	2 hr	4 hr	6 hr	2 hr	4 hr	6 hr	Max
31	Control	113	101	108	111	−11	−4	−2	−11
	Adrenaline	136		51			−63		−63
	Ephedrine gr 1	121	84	54	42	−31	−55	−65	−65
17	Adrenaline	686		511			−26		−26
	Ephedrine gr $^1/_2$	603		355			−41		−41
37	Control	406	439	330	352	+8	−19	−13	−19
	Adrenaline	352		194			−45		−45
	Ephedrine gr 1	391	266	111	165	−32	−72	−58	−72
38	Control	248	185	173	232	−25	−30	−6	−30
	Adrenaline	216	118	123	168	−46	−44	−23	−46
	Ephedrine gr 1	224	184	103	100	−18	−54	−55	−55
39	Control	142	127	146	122	−11	+3	−14	−14
	Adrenaline	155	79	57	81	−49	−63	−48	−63
	Ephedrine gr 1	149	128	80	87	−14	−46	−42	−46
40	Control	348	296	290	356	−15	−17	+2	−17
	Adrenaline	355	224	203	301	−37	−43	−15	−43
	Ephedrine gr 1	376	269	198	245	−28	−47	−35	−47

The differences between the adrenaline and ephedrine figures and the controls (last column) were analysed by means of Student's t test Case 17 was excluded because control figures were not available The adrenaline and ephedrine figures both differ significantly from the controls the values of P being less than 0 01 in each case

The effect of ephedrine would perhaps be expected, since this drug may act, at least in part, by virtue of its anti-amine oxidase action, which would preserve adrenaline liberated at adrenergic nerve endings In view of its greater stability, ephedrine would probably be superior to adrenaline as a standard in this type of investigation, while supplies of A C T H for this purpose remain limited

It is possible that the therapeutic action of ephedrine in allergic conditions is partly due to the release of A C T H

SUMMARY

The effect on the eosinophil count of ephedrine given by mouth has been compared with that of subcutaneous injections of adrenaline and of distilled water Ephedrine produced a significant eosinopenia

The limitations of the method in screening tests for cortisone substitutes are defined

It is suggested that ephedrine could be employed as an alternative standard while A C T H remains scarce

Our thanks are due to Dr G E Beaumont, Dr C A. Keele, and Dr J G Scadding for advice and encouragement, to the Pathology Department, Brompton Hospital, and Messrs Hawksley and Sons for laboratory facilities, and to the patients for their coöperation

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HÆMOPHILUS INFLUENZÆ MENINGITIS

REPORT OF FIVE CASES

JAMES SANDILANDS
M B Edin, M.R C P.E
MEDICAL REGISTRAR, CAMBORNE REDRUTH MINERS' AND GENERAL HOSPITAL

OF the six cases of non-tuberculous meningitis admitted to this small general hospital in just over two years, five have been due to *Hæmophilus influenzæ* This relatively high incidence has not been noted in other hospitals in Cornwall, including the isolation hospital At each of three comparable hospitals single cases only have been seen in the same period No connecting factor was noted between the Camborne cases, which occurred at wide intervals

Boisvert (1948), in the U S.A, showed that the incidence of *H influenzæ* in the nasopharynx tends to be familial, though the case incidence of meningitis due to this organism was not familial in distribution Ounsted (1949) noted that his cases tended to be drawn from large families in which there were several siblings older than the patient, and he suggests (Ounsted 1950) that this may be typical of *H influenzæ* meningitis, inferring that passage of the organism through these siblings may heighten its virulence Large families were not noteworthy in the present series No studies of siblings were attempted, but *H influenzæ* was found in a throat swab from a parent in one case

Harries and Mitman (1947) stated that *H influenzæ* meningitis was the most common form of meningitis admitted to the Children's Hospital, Boston, U S A, 1933–36, when meningococcal meningitis was not epidemic Ounsted (1949) considers that the absolute as well as the relative incidence of *H influenzæ* meningitis may have increased This also seems likely from the figures published by Braid and Meyer (1949) The reason for this change in relative incidence as compared with meningococcal meningitis may very well be the widespread use of sulphonamides in the febrile illnesses met with in general practice These drugs would tend to abort the meningococcal infection in its septicæmic phase, and the greater resistance of *H influenzæ* may explain why there has been no similar fall in the incidence of this infection. Thus, in three of the cases described below, preliminary treatment with penicillin and/or sulphonamides before the meningitic stage did not seem to abort the condition. The reports cited, although they suggest an increased incidence, are not conclusive, and more information is required

CASE RECORDS

Case 1 —A boy, aged 1 year, was admitted on July 14, 1947, having been listless and anorexic for three days before. There was no relevant past or family history

On examination (not seen by me) he was restless, apathetic, and feverish, with a temperature of 101 8°F There was obvious meningism, and his reflexes were brisk The cerebrospinal fluid (C S F) was turbid and under a pressure of 300 mm. and contained sugar 18 mg per 100 ml., 8000 polymorphs per c.mm., and Pfeiffer's bacilli

Treatment —The patient was given 20,000 units of penicillin intrathecally every day and 50,000 units intramuscularly six hourly plus sulphamerazine by mouth to a total of 6 g in a week

Progress —Three days after the start of treatment the child's temperature fell to normal and he seemed improved, but the C S F still contained nearly 3000 cells and some Pfeiffer's bacilli The intrathecal dose of penicillin was reduced to 10,000 units and then to 5000 units daily After a further eight days there was thought to be some improvement in his general condition and his meningism and rigidity were less pronounced, but his temperature was rising, and he did not take his feeds well and vomited Next day he was blind, with pupils which reacted only slightly to light, severe meningism, and spastic limbs Penicillin 50,000 units was administered intracisternally and 10,000 units by lumbar puncture On the same evening the child had a convulsion. On July 27 he died

Necropsy showed influenzal bronchopneumonia and a meningeal exudate at the base and over the vertex, especially the frontal region The ventricles were free from infection.

Case 2 —A boy, aged 12 years, was admitted on March 31, 1948, having been out of sorts for two weeks (later his mother said he had had a head injury) His initial complaint was vomiting with pain in the right iliac fossa, present for a week, and headache There was no relevant family or past history

On examination he had a furred tongue, no abdominal distension, but deep tenderness in the right iliac fossa with some guarding, and tenderness in the left iliac fossa No other abnormalities except a slight cough were noted. His temperature was 98 8°F

Treatment was begun with sulphadimidine ('Sulphamezathine') by mouth and 30,000 units of penicillin every three hours intramuscularly

Progress —Next day the boy's temperature was 104°F and he complained of headache and had a harsh loose cough Cerebration seemed to be impaired, and he was grinding his teeth. A few purpuric spots were seen on the abdominal wall, the throat was red and mucopus was seen in the nasopharynx Tenderness was noted over the maxillary and frontal sinuses There was neck rigidity, with a positive Kernig's sign and extensor plantar responses The C.S.F was accidentally contaminated with blood, and the pressure was not read but it contained less than 5 cells per c.mm and no organisms the sugar content was 75 mg per 100 ml.

On the third day the fever was less, but meningism was still present The ears appeared healthy The C.S.F pressure was 165 mm, with the same pathological findings The blood white-cell count was 15 000 per c mm, predominantly polymorphs Dr N S Alcock, the neurologist saw him that day, found no meningism and thought the condition was not intracranial

By the fifth day the boy's fever had subsided and he seemed ich better, with no meningism, but slept a lot A chest liogram was clear, but both antra and frontal sinuses were aque Nothing abnormal was found in the urine There s a leucocytosis of 16,000 per c mm., but a blood culture is negative on April 7 The patient remained fairly well, d his temperature did not rise above 99°F, except for an casional spike to 100°F

On April 13, two weeks after admission, he had twitching the right side of his face, was drowsy, vomited, and was contment of urine and fæces afterwards Next day the s.r was clear, under normal pressure, with 55 cells per mm. (mononuclears), sugar 75 mg per 100 ml, protein mg per 100 ml., and no organisms in film or culture ie ophthalmologist reported that the optic fundi were ormal

By April 15 the patient was much worse, being semi-matose with sluggish pupils, and his fever reappeared 04°F) The neurologist examined him next day when a ght hemiplegia had developed He thought the case was ossibly one of tuberculous meningitis but did not consider iere was any indication for transference to a neurosurgical nit The patient died on April 17

Necropsy revealed a purulent meningitis encapsulated ver the left cerebral hemisphere Both ethmoids showed reenish yellow pus containing *H influenzæ*, as did the ieningeal pus There was no evidence of a fractured skull 'he bowel contained many specimens of *Ascaris lumbricoides*

Case 3 —A boy, aged 1 year, was admitted on April 18, 948, having been listless irritable, and holding his head as f in pain for six days He now had a little diarrhœa, also ais past health and family history were not relevant

On examination he was a well nourished child, flushed, and vith superficial scalp veins standing out prominently He -ooked mentally alert and resented interference, holding his head with his hands His temperature was 102°F No lefinite physical signs were found, and meningism was absent Next day the findings were the same, but there was slight evidence of meningism The c.s.r was slightly turbid, under a pressure of 290 mm, and contained 700 cells per c.mm. (polymorphs), with sugar less than 20 mg per 100 ml, and many *H influenzæ* (Pittman s type B)

Treatment was begun with sulphadiazine by mouth, penicillin 30,000 units intramuscularly three hourly, and 25,000 units intrathecally b d from a study of the available published reports it seemed that a larger single intrathecal dose might cause convulsions, but further information indicated that this applied only to the cruder penicillins

Progress —After three days the child s appearance had not changed but his temperature was falling On the fourth day the c.s.r was clear and pressure normal, and two days later the cell-count had fallen from 4000 to 360 per c.mm and no growth was obtained on culture Fever had subsided, and the child s general condition was fair Sulphadiazine was stopped because of temporary anuria after five days, but was started again on April 27 and continued until May 3 Throat swabs from the child grew *H influenzæ*, but those from the parents were negative He remained well, with no exacerbation of fever, but there was a transient slight reappearance of Pfeiffer's bacilli in the c.s.r on May 3, with a rise in the cell-count from normal to 200 per c.mm. The skin on the child s back was breaking down and he had had a full course of sulphadiazine, so all specific treatment was stopped on May 4, when the c.s.r was once more sterile The c.s.r remained sterile with the cell-count (mononuclears) raised to 20 per c.mm. until May 29, when the count was less than 5 per c.mm The child now appeared completely normal

Follow-up —When seen one and two months later the child seemed well, with no abnormalities of behaviour Seen again a year later he was quite normal.

Case 4 —A girl, aged 13 months, was admitted on May 31, 1948, having had vomiting and fever for three weeks She had had convulsions three weeks ago, but these were discounted because her father was an epileptic One red and bulging ear-drum was said to have been seen at the time Sulphonamides had been given and seemed to improve her In the past week she had deteriorated and developed neck rigidity and vomiting.

On examination she was a well nourished but irritable child, with obvious neck rigidity, sluggish pupillary reaction to light deviation of the eyes to the right, and left facial weakness No signs of otitis were seen Her temperature was 99°F The pressure of c.s.r was not read, only a few drops being collected, but it contained 960 cells (polymorphs) per c.mm, sugar 6 mg per 100 ml, and many *H influenzæ*

Treatment was begun with 'Soluthiazole' intramuscularly and penicillin 25,000 units intramuscularly three-hourly and 50,000 units intrathecally daily

Progress —On the third day there was obvious head-retraction and retraction of eyelids The eyes were deviated to the right, with left hemiparesis, and absent light reflex in the left pupil The child seemed almost blind There was no change next day, and, though fever was low, the c s r remained infected, with a high cell count, and there was clearly a partial block Treatment was continued by the cisternal route, from whence specimens of c.s r were less xanthrochromic but also infected c s r from the cisterna magna became sterile on the eighth day, but the cell-count was high and the child's clinical condition had deteriorated She died on the twelfth day

Necropsy showed both middle ears healthy There was purulent basal meningitis with thick greenish pus round the chiasma, the pons, the base of the cerebellum, and the spinal cord, with many adhesions round the foramen magnum The lateral ventricles were very dilated with turbid c.s.r and flakes of greenish pus

Case 5 —A boy, aged 7 months, was admitted on Oct 9, 1949, having apparently had pain in the left side of his head with fever and diarrhœa, for the previous week. His brother had had a febrile illness with whitlows two weeks before The patient was just being weaned when his illness began He cried a lot on Oct 5 and had rigors He held the left side of his head and tended to turn it to the left He was thought to have a left otitis media and was treated by his own doctor with penicillin to a total of 250,000 units The diarrhœa cleared but it reappeared, with blood streaking, on the day of admission

On examination he was a well nourished child, with no definite abnormalities except the fleeting suggestion of a left internal squint There was no meningism, and his ears were healthy An X ray film of his chest showed clear lung fields His white-cell count was 33,000 per c.mm (polymorphs 68%)

Progress —Next day (Oct 10) the boy had a convulsion in the evening There was still no meningism, and the fontanelle and sutures were not bulged or separated, but he rolled his head about as if in pain. The c.s.r was cloudy, under increased pressure and contained 3000 cells per c mm, with no sugar, and elongated gram negative bacilli, later identified as *H influenzæ*, were found.

Treatment —Penicillin and sulphadiazine treatment was begun intramuscularly, but the penicillin was stopped next day, and streptomycin begun in a dosage of 75 mg intrathecally and 0 75 g intramuscularly each day Meningism was definite three days after admission

Further course —After three days treatment the child was improved, alert, and recognised his parents His c.s.r was sterile, but the cell count was still high. Temperature 100–101°F On the seventh day of treatment streptomycin was reduced to 50 mg intrathecally and 0 5 g intramuscularly daily, and next day the fever had gone and the child was well Intrathecal treatment was stopped on the tenth day By the seventeenth day the child was still very well and active in his cot, but he seemed to hold his back stiffly Since there was no neck rigidity or Kernig s sign, this may have been due to the trauma of lumbar puncture All treatment was stopped On Nov 2 there had been no deterioration. The c.s.r was sterile but contained 55 cells per c mm with 90 mg of protein per 100 ml.

On Nov 7, the cells in the boy s c s.r numbered 44, and on Nov 14, 22 per c.mm. He was thriving and was discharged, to be reviewed later

DISCUSSION

The prodromal period in the present cases was as variable as in those described by Zinnemann (1946), Braid and Meyer (1949), and Ounsted (1949) The variability of the presenting symptoms, which has been noted elsewhere, was present to some degree in this small series However, head pain was present in 3 cases, and otitis media was suspected, wrongly as it turned out, in 2 of these Convulsions occurred in the early stages in

2 cases Localising signs of nervous involvement were present in only 1 case (case 4) on admission It was note worthy that meningism, as shown by a positive Kernig's sign and neck rigidity, was present on admission in only 2 cases, both ultimately fatal, the prodromal period was short in one of them and long in the other This indicates the chief diagnostic difficulty Diarrhœa was noted in 2 cases at an early stage, and the abdominal pain in case 2 was a "red herring," later supposed to be due to ascariasis

It therefore seems that the practitioner is faced with the same problem here as in the early diagnosis of tuberculous meningitis, without the help of a significant contact history which is so often present in the tuber culous cases That the admission of the patient to hospital, however, may not at once clarify the diagnosis is exemplified by case 2, who showed transient meningism at an early stage but with a normal C S F He was seen by a neurologist next day and again later and was thought not to have any intracranial disease

Blood culture has produced a positive diagnosis in many cases in an early stage, but in the one case in which this would have been useful (case 2) it was done after penicillin and sulphonamide therapy were begun and may have been negative for that reason The C S F was extremely misleading because, even when the cell-count rose the fluid was sterile and the cells were mono nuclears This type of case must be extremely rare but, since it seems to be eminently curable by modern methods, it deserves further consideration In only 1 case were the bacilli typed and here (case 3) they were Pittman type B The sugar in the C S F was much reduced or absent in all cases except case 2, where it was normal even in the terminal stage

The question of surgical aids to diagnosis in cases of meningitis has been discussed by Cairns (1949) Perhaps few would agree that neurosurgical facilities are necessary at all hospitals treating meningitis, but, since modern methods have given hope in previously hopeless cases, such possibilities must be considered Sampling of the ventricular fluid would certainly have revealed the diagnosis in case 2, and ventriculography might exclude intracranial tumour or abscess in doubtful cases where it might be dangerous to proceed too hurriedly with intrathecal antibiotics Cairns (1949) recommends the ventricular route in treatment in all cases where signs of intrathecal blocking are present after use of the lumbar route He points out the dangers of the cisternal route in cases with severe head retraction An example of this was case 1 One feels that cases 1 and 4 might have responded to ventricular antibiotics This treat ment also may avert a long term result such as that quoted by Cairns and described by Baker (1934), when a girl of 17 died of hydrocephalus resulting from a meningococcal meningitis in infancy The long term results of modern treatment of meningitis have still to be observed

Other adjuncts to chemotherapy and antibiotics are heparin and air, which seems to have been discarded, and streptokinase (Cathie 1949) One would like to hear more of the latter Specific antiserum seems to be no longer necessary Gaisford (1949) emphasises the importance of a massive initial dosage of streptomycin Ounsted (1949), on the other hand, recommends dosage on the lines suggested by the Medical Research Council and adjusted to the patient's clinical response, strepto mycin was used thus in case 5 and the baby rapidly recovered but after two months he has a C S F cell count of 22 per c mm, though otherwise well The results achieved in Ounsted's series seem to justify this method, and, with the short course of streptomycin given, the question of resistance will probably not arise in the average case, although this criticism of the treatment is offered by Braid and Meyer (1949) and Wilson (1948) Penicillin, although less rapid in its action, would always be available for treatment of the resistant case.

Some observers have described a high recovery rate with no intrathecal treatment, on streptomycin and sulphonamides, usually sulphadiazine (Hoyne and Brown 1948), but, with complicated cases such as cases 1, 2, and 4, it seems obvious that something more is required, probably surgical assistance or perhaps streptokinase or a similar agent intrathecally

Several observers have noted the satisfactory mental development of recovered children, in spite of the considerable inflammation and scarring which must at one time have been present The 2 recovered cases in this series are certainly normal children, but 1 has been observed for only a very short period The passage of years may possibly show some late results from scarring in cases where a block has apparently been successfully circumvented

SUMMARY

A relatively high local incidence of *H influenzæ* meningitis is noted

Cases are described, including one of particularly obscure nature

The difficulties of diagnosis are considered and modern views on treatment discussed

My thanks are due to Dr L W Hale and Dr R H Blair for their helpful criticism and permission to publish these cases

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SUDDEN DEATH OF YOUNG ATHLETE FROM RUPTURE OF ASCENDING AORTA

ERNST JOKL
M.D Breslau
RESEARCH OFFICER, DEPARTMENT OF EDUCATION, ARTS, AND SCIENCE, PRETORIA

R H MACKINTOSH
L R C.P.E
PATHOLOGIST, SOUTH AFRICAN POLICE MEDICO LEGAL LABORATORIES, JOHANNESBURG

A WELL BUILT athlete, aged 15, returned from a gymnastic class during which he had indulged in weight lifting and wrestling On reaching home he collapsed with a vice like pain in the chest and died within an hour

NECROPSY FINDINGS

The young man was 5 ft 8 in tall and weighed 141 lb His musculature was strong and general development good, but sexually he was retarded

Heart —The pericardium was tense and bluish and contained 150 ml of coagulated blood and 650 ml of fluid blood and hæmorrhagic serum The left ventricle was dilated and hypertrophied, being twice the normal size No fibrous patches were noted in the myocardium The foramen ovale was closed All three cusps of the aortic valves were present The ductus arteriosus was patent and filled with a fresh thrombus

Aorta —The isthmus of the aorta was so narrow that it admitted only a fine metal sound Above the stenotic part the aorta was considerably dilated, forming a flaccid aneurys

nal bag which bulged towards the right side There was a tear 3 cm long in the lateral wall of this bag, starting just above the aortic valves and establishing a communication between the lumen of the aorta and the pericardium The internal mammary arteries were much enlarged, their calibre corresponding to that of radial arteries of normal adult males Below the stenosis the aorta was about half the normal width Its walls were abnormally thin No arteriosclerosis or atheroma was noted

Lymphatic Tissue—A persistent thymus gland, weighing 38 4 g, with active Hassall s corpuscles was found There was an abundance of lymphatic tissue, especially in the spleen and the mesentery Large lymphatic plaques were noted in the mucosa of the small intestine

DISCUSSION

This case was characterised by the presence of multiple congenital anomalies of the cardiovascular system, of which the stenosis of the isthmus of the aorta is the most important This stenosis formed a mechanical obstruction, which explains the considerable dilatation of the aorta above the isthmus, the compensatory overdevelopment of the internal mammary arteries, and the hypertrophy of the left ventricle There were present a persistent thymus gland with active Hassall's corpuscles, hypoplastic thin walled arteries, and a general abundance of lymphatic tissue The immediate cause of death was rupture of the ascending aorta

The deceased had been a first class athlete and, though he was sexually underdeveloped, neither his general bodily growth nor his physical efficiency had been retarded by the congenital disease which caused his premature death This observation, however, is not unique Bonnet (1903) has pointed out that, in the presence of isthmus stenosis, collateral circulation may completely compensate for the central defect Hart (1920) has published a case of sudden death in a man, aged 41, who before his fatal collapse could do strenuous physical labour Necropsy revealed complete obliteration of the isthmus, thrombo endocarditis of a two-cusped aortic valve, mesaortitis syphilitica of the thoracic portion of the aorta, and hypertrophy of the left ventricle Above the obliterated isthmus the aorta showed a "balloon like" enlargement

The question arises as to what part the weight lifting and wrestling played in causing the fatal tear of the aorta No doubt the physiological rise in blood pressure invariably accompanying activities of this kind must have exerted a deleterious influence (Jokl 1947)

A similar observation was reported by Wasastjerna (1903) concerning a boy, aged 13, who collapsed while skating Jores (1924) emphasised the general significance of physical effort in cases of rupture of the aorta in persons with stenosis of the aortic isthmus and ventricular hypertrophy He said that, provided a good collateral circulation was established, exercise would not cause a rupture unless there was aneurysmal enlargement of the aorta and abnormal thinness of the artery walls Contrary to what may be expected, arteriosclerosis is usually not present in cases of this kind, though the elastic elements of the artery walls are as a rule affected

The condition is rare, among 5000 necropsies conducted between 1900 and 1905 by the Vienna Medico Legal Institute, only 4 instances of advanced stenosis of the aortic isthmus were encountered A good general discussion of this question can be found in the textbook of Henke and Lubarsch (1924)

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PROGRESSIVE LIPODYSTROPHY

REPORT OF TWO CASES

ROBERT P WARIN
M D Leeds, M R C P
DERMATOLOGIST, UNITED BRISTOL HOSPITALS, CLINICAL TEACHER IN DERMATOLOGY IN THE UNIVERSITY OF BRISTOL

JOHN T INGRAM
M D Lond, F R C P
PHYSICIAN IN CHARGE THE SKIN DEPARTMENT, THE GENERAL INFIRMARY AT LEEDS, LECTURER ON DISEASES OF THE SKIN IN THE UNIVERSITY OF LEEDS

THE ætiology of progressive lipodystrophy is unknown Hartston (1933), reviewing the published cases and reporting two new ones, said that the onset often followed an acute specific fever He referred to the association of changes indicating sympathetic disturbance, such as trophic changes in skin and nails, pigmentation, acrocyanosis, and abnormal perspiration

Thomson (1936) described a case of segmental atrophy of fat of subcutaneous tissues, which Parkes Weber regarded as a variety of deep scleroderma

Weber and Bode (1930) reported facial lipodystrophy associated with unerupted central incisor teeth in a child and manifest first at the age of 4½ years They emphasised that the affection was not necessarily progressive, and regarded it as a congenital developmental abnormality

An endocrine origin has been suggested, and cases have been reported in which thyrotoxicosis (Ziegler 1928, Marañon and Blanco Soler 1926), myxœdema (Christiansen 1922, Alquier and Humbert 1922), pituitary dysfunction (Christiansen 1922), and diabetes (Ziegler 1928) have been present Zalla (1920) described a patient in whom the pituitary gland was found at necropsy to be compressed and flattened and the sella turcica enlarged

Discussing a case presented by Cockayne (1932) Parkes Weber questioned whether such fat atrophy might not depend on basophilic hypopituitarism, since fat hypertrophy, according to the work of Cushing, might depend on basophilic hyperpituitarism

The association of progressive lipodystrophy with changes in the central nervous system has been reported by several workers Perutz (1932) suggested a relationship between lipodystrophy and lesions in the mid brain Sarbo (1921) described a girl, aged 16, with typical symptoms of involvement of the striate body following encephalitis contracted in the epidemic of 1920, there was rapid emaciation of the face and upper half of the body, but the hips were so enlarged by abnormal deposit of fat that she could not put on her old skirts Pollak (1930) described one patient who also showed choreoathetoid movements Klien (1921) noted progressive lipodystrophy after cerebral concussion Maslov (1930) reported a case which he attributed to a cerebral lesion the patient, a woman aged 38, had chronic rheumatoid polyarthritis and epidemic encephalitis there was great accumulation of fat on the lower trunk, and she was 5 ft ¼ in tall and measured 52 in round the hips Ewserowa (1929) reported the case of a woman of 30 in whom the onset of progressive lipodystrophy coincided with the development of Jacksonian epilepsy Radiography showed a hyperostosis extending upwards from the back of the sella turcica

In the following two cases, personality changes suggested possible nervous factors in the ætiology of the disease

CASE RECORDS

Case 1—A married woman, aged 47, was one of seven children. There was no family history of lipodystrophy, epilepsy, or other significant illnesses and she had had no previous illness of note Her first pregnancy occurred at

the age of 26, and her second at 42 Menstruation returned normally after each pregnancy and was still regular The lipodystrophy probably started at the age of 26, after the birth of the first child No sudden change was noted, the condition developing gradually The patient could not say whether or not the condition spread from above downwards Major epilepsy started a few months after the birth of her first child It is not known whether the lipodystrophy preceded the fits, but the two conditions started about the same time Fits have been experienced regularly, with no period of freedom longer than a few weeks, and there has been no aura The fits commonly occur during menstruation They have been observed in hospital and consist of a sudden loss of consciousness, no typical tonic and clonic phases have been observed, but the patient has often been incontinent and has often injured herself Loss of consciousness lasts 2 or 3 minutes and is followed by confusion, stupor, and aggression lasting a few hours The patient has not been under regular treatment

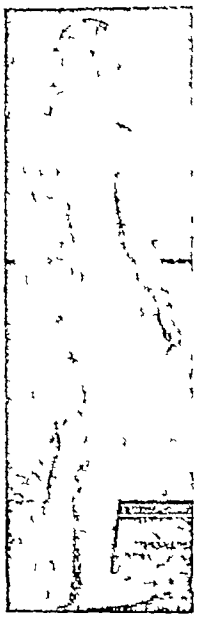

Fig 1—Loss of subcutaneous fat in upper half of body (case 1) with line of demarcation in crease between buttocks and thighs

The patient attended the dermatological outpatient department of the General Infirmary at Leeds in June, 1947, with a few months' history of typical lupus erythematosus over the bridge of the nose

On examination loss of subcutaneous fat affected the face, arms, and trunk to the pubes and was fairly well demarcated across the buttocks at the level of the greater trochanter Below this the subcutaneous fat appeared to be normal The photograph (fig 1) does not show the line of transition clearly, but it was readily appreciated by pinching up folds of skin above and below the line of demarcation The face had the typical sunken appearance of progressive lipodystrophy (fig 2) Apart from the loss of subcutaneous fat the skin appeared normal in texture, and hair distribution was normal No other abnormalities were found The blood pressure was 160/90 mm Hg There was no albumin in the urine, nor any reducing substances when tested with Benedict's reagent The blood Wassermann reaction was negative Blood cholesterol levels were total cholesterol 297 mg per 100 ml, free cholesterol 125 mg per 100 ml, and ester cholesterol 172 mg per 100 ml The proportion of esterified cholesterol was 58% A glucose tolerance test showed a "lag" or "steeple" curve

	Blood sugar (mg per 100 ml)	*Urine sugar*
Specimen 0	93	0
" 1 (1/2 hr)	250	0
" 2 (1 hr)	218	–
" 3 (1 1/2 hr)	137	0
" 4 (2 hr)	73	0

Lumbar puncture was refused

Fig 2—Typical appearance of face in progressive lipodystrophy (case 1)

Radiography of the skull showed no abnormality Electro encephalography showed no abnormality either at rest or on overbreathing There was a good medium voltage normal alpha rhythm of 9 per sec, which was symmetrical

Progress—Shortly after the patient came under observation she became confused, aggressive, and unmanageable and was admitted to Menston Mental Hospital Her mental condition has not improved, and she is reported as being dull, querulous, and self centred, showing dissatisfaction with her position and general treatment She is inclined to interfere in the affairs of others, occasionally becomes aggressive and violent towards patients and nurses and has to be nursed in a single room. She has made several attempts at suicide Her epileptic fits occur with an average frequency of four a month During the past year the line marking the junction between the normal subcutaneous fat and the lipodystrophic area has moved from across the buttocks at the level of the greater trochanter to a line lying in the crease between buttocks and thighs It is unusual for fat atrophy to affect buttocks and lower legs in progressive lipodystrophy There has been a little improvement in the lupus erythematosus but this condition is still present

Case 2—A boy, aged 11 years, had been normal to the age of 6 years, when some teeth were removed, after which his face became thin in a few weeks The rest of his body was similarly affected later, but recently his legs have "filled out" a little, according to his parents He was extremely timid, troublesome at school, difficult with playmates and moody and restless at home A brother, an idiot, suffered from choreiform movements and double incontinence, could not walk or speak, and was admitted at the age of 4 years to a mental institution, where he died two years later from bronchopneumonia Two other brothers, aged 7 years and 2 1/2 years, were alive and well

On examination there was much wasting from loss of fat affecting the face very much and the trunk moderately (fig 3) No other abnormality was found on inspection

Radiography of the skull, pituitary fossa, arms and legs, and chest showed no abnormalities

Blood—The blood picture was normal and a Wassermann reaction was negative

Electro encephalography showed very little of the normal alpha activity and some excess of slow-wave activity over both hemispheres This type of abnormality is regarded as non specific and is found in normal persons, epileptics, and psychopaths, and even sometimes with cerebral tumours

Fig 3—Progressive lipodystrophy (case 2), showing gross wasting of face and moderate involvement of trunk.

DISCUSSION

It seems that the association of progressive lipodystrophy with endocrine and nervous disorders is more than a coincidence The association of changes in the central nervous system has led to the suggestion that lesions of the mid brain may cause progressive lipodystrophy Klien (1921) and Christiansen (1922) put forward the view that disturbances of the endocrine system and of the autonomic nervous system may act reciprocally Beznak and Hasch (1937) have shown that, when the sympathetic supply to an area is cut, the deposition and mobilisation of fat in that area is retarded de Langen (1938) brings forward considerable evidence in favour of the nervous control of fat metabolism through a centre in the mid brain The serum lipoid level increases greatly with large doses of barbiturates but those narcotics which seem to act on the cortex rather than the mid-brain do not produce this effect Section of the cord below the third thoracic vertebra in rabbits prevented this rise in serum lipoids level

after administration of 'Veronal' de Langen also showed that the administration of anterior pituitary extract to animals caused an increase in serum lipoids, whereas administration of posterior pituitary extract caused a decrease On the basis of this work it is tempting to speculate that in progressive lipodystrophy a lesion or disturbance of function in the mid brain affects the subcutaneous fat through autonomic connections, and that this mid brain centre can be influenced by endocrine function

SUMMARY

Two cases of progressive lipodystrophy are reported

The first, a woman, developed epilepsy about the time of onset and later became psychotic

The second, a boy, had abnormal personality traits and an abnormal electro encephalographic record

The association of changes in the central nervous system with progressive lipodystrophy is discussed

We wish to thank Dr Maxwell Telling for permission to investigate and report case 2, Dr J Dawson for the blood-cholesterol investigations, Dr D Taverner for electro-encephalographic reports, Dr R H Seville for the photographs, and Dr R W Lennon for the report on the mental condition of case 1

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New Inventions

DISPOSABLE ILEOCOLOSTOMY BAGS

THE Koenig-Rutzen bag, or its English counterpart described by Hardy and his colleagues,[1] gives the patient with an ileostomy or an unreliable colostomy almost complete security from "accidents" and even minor soiling of the underwear But the rubber bags are expensive, the special adhesive with which they are stuck to the skin is somewhat messy to apply, and cleaning them at bedtime or before catching the morning train seems a tedious job

The ideal bag would be self-adhesive, like the Bunyan-Stannard envelopes used for burns, and so cheap that it could be discarded when soiled, like a paper handkerchief, and replaced by a new one It must be large enough for there to be no risk of its being overfilled with fæces or (if it is gastight) with flatus, strong enough to withstand a recumbent patient's weight or the pressure of a belt, and not liable to emit embarrassing crackles when the patient leans forward to take a cup of tea

This ideal has not yet been realised, but the bags here illustrated (fig 1) come near it, so far as can be judged from trials on one colostomy. They are intended to be "assembled" by the patient or nurse from two components—an oblong transparent plastic bag, sealed at one end, and a square of adhesive plaster, sticky on both sides, with a one inch circular hole in the middle—as follows

First decide whether the hole in the plaster will fit over the opening in the bowel, and if not how big it must be Remove the gauze from one side of the plaster and stick the square on to the bag so as to leave about a quarter of an inch uncovered at the open end. Insert two fingers into the bag and cut a hole in the gauze and bag wall through the window in the plaster, enlarging it if necessary Fold over the open end of the bag

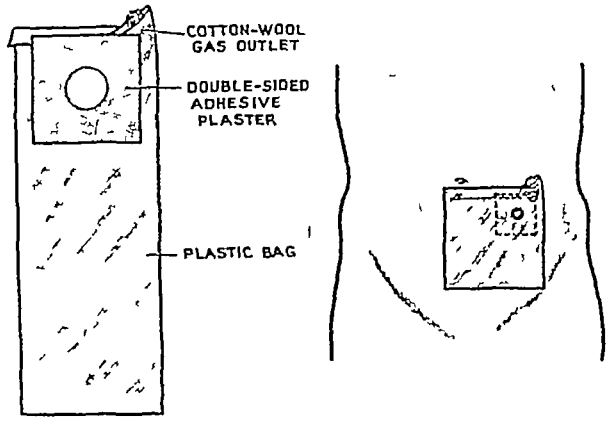


Fig 1 Fig 2

Fig 1—Standard bag assembled Bag is 10 in length of flexible transparent seamless plastic tubing 3½, or 4 in wide sealed at end Double-faced plaster square is ½ in narrower, to allow bag to bulge forwards Square may be placed near middle or at sealed end of bag open end being closed with special clip

Fig 2—Square bag applied Standard bag can be worn vertically or horizontally; vertical bag with open end below can be emptied in situ, if necessary

and tuck it under the plaster, leaving one corner free to provide an exit for flatus Poke a wisp of cotton wool into this corner from below

After a little practice all this can be done easily in five minutes, and in odd moments a little stock of bags can be assembled ready for use When the bag is applied one has only to remove the remaining piece of gauze, insert the protruding bowel (if any) through the hole, and press the plaster firmly on the surrounding skin. In removing the bag there is usually no difficulty in peeling the plaster away from the skin, the use of benzene to loosen it sometimes causes soreness

The standard bag will usually be worn with its long axis vertical, but for patients in bed the horizontal position, with the hole placed nearer the middle, seems preferable A square bag (fig 2), with the hole towards one upper corner, may be worth trying

Some additional support for the bag will probably be needed, though in some cases two or three turns of a wide crêpe bandage will be sufficient Where there is a tendency to prolapse, and for the more active patient, an elastic webbing belt has proved highly satisfactory, this has a plastic insertion over the colostomy and carries a modified St Mark's shield, in which a semilunar piece has been cut away from the lower edge, so that pressure is applied without obstructing the passage of fæces into the bag

A still simpler method of fixing the bag has been tried, but cannot yet be recommended This is by inserting a square of ordinary 3 in adhesive plaster inside the bag, cutting a small *circular* hole in the plaster to fit over the bowel opening, and then cutting a larger *square* hole in the bag wall In this way a strip of the adhesive surface is exposed round the hole in the plaster which will hold the bag on the skin.

The standard bags, plaster squares, clips, and supporting belts are supplied by Messrs Down Bros and Mayer & Phelps Ltd., and the designs have been largely the work of Mr Gaillard of that firm

E CLAYTON-JONES
M.D Camb

1 Hardy T L, Brooke B N Hawkins C F *Lancet* 1949 ii 5

"In England and Wales during the year 1947, 664 children under one year of age died because their parents' blood would not mix During that year, just over eighteen out of every 1000 children dying under the age of one year died from this cause Further, it is likely that some hundreds of children were stillborn and some hundreds of the survivors are mentally defective for the same reason. During the same year, 523 persons of all ages died of cerebrospinal fever, 644 of measles, and only 242 of diphtheria "—Dr R N C McCURDY *The Rhesus Danger* London Heinemann Medical Books 1950

Reviews of Books

Handbook of Diseases of the Skin

RICHARD L SUTTON, M.D, emeritus professor of dermatology and syphilology, University of Kansas, RICHARD L SUTTON, Jr, M D, associate professor of dermatology and syphilology in the university London Henry Kimpton 1949 Pp 749 63s

INSTEAD of revising older works by himself and his father, Dr Sutton Jr, has produced an entirely new textbook of diseases of the skin Inevitably much of their old material has been used, but by starting afresh in this way he has produced a thoroughly up-to-date book, free from obsolete material The illustrations and make up are first-class, and the text comprehensive The commoner diseases are in ordinary type and the rarities in small print The numerous references are incorporated in the text, which makes reading a little difficult, the alternative method of collecting references at the end of each section might have been more comfortable for readers The work will be accepted as one of the leading large standard reference textbooks

Operative Technique in Specialty Surgery

Editor WARREN H COLE, M D F A C S, professor of surgery, University of Illinois New York Appleton Century Crofts 1949 Pp 725

A SYMPOSIUM of articles written by such men as Smithwick, Naffziger, Meigs, Beck, and Frank Dickson, all acknowledged experts in their specialised fields, requires no 'trailer' Plastic, thoracic, orthopædic, neurosurgical, gynæcological, and genito urinary surgical specialties are all dealt with in great detail The authors describe their own methods, and dwell largely on the practical aspects, but where necessary academic facts are clearly stated The result is a book which is refreshingly vital and provocative Experience teaches, and the authors have passed on the lessons of their specialised experience in a fascinating manner There is not a poor article in the book, and personal interest or ignorance alone will make some sections more or less appealing Beck's chapter on cardiac surgery, a model of lucidity, gives a wealth of information in a few pages Meigs's chapter on gynæcology, dealing largely with the treatment of malignant disease by radical resection, will interest all general surgeons Dickson details his methods in osteomyelitis and shows very convincing figures in favour of primary closure after sequestrectomy In the article on prostatectomy Frever's methods are advocated, and the claim is made that bladder mucosal "fringes" are an asset rather than a disadvantage Fine production, printing, and illustrating help to make this a work of value to the practising general surgeon

The Ordinary Devoted Mother and Her Baby

D W WINNICOTT, F R C P 1950 Pp 47 1s (From the author, 47, Queen Anne Street, London, W 1)

Dr Winnicott has made a pamphlet of nine broadcast talks In them he is trying to do something very difficult—to formulate experiences and feelings that are not often put into words, to try to put a finger on the numberless small observations and responses which make a success of the sensitive mother's relationship with her baby These things are not easy to talk about or put across The intuitive person does them unreflectingly The insensitive person either does not know of their existence, or struggles painfully to acquire some specific skills, when what is wanted is the capacity to perceive the only just perceptible, to interpret these very faint signals and to supply whatever needs they express Dr Winnicott is at times brilliantly successful at showing what he sets out to show, and, perhaps even more important, at showing what sort of thing he wants to show Criticism might, however, be directed at one point of technique This is the device of saying "you" when he means "I" For example "You know that the first object your baby loves—a bit of blanket or a soft toy—for the infant this is almost part of the self" This may be good for the suggestible, but almost certainly bad for the contra suggestible and irritating for the few who like to understand what is being said to them A more fundamental quarrel is with Dr Winnicott's unstated assumption that parents are perfect The good mother will, on this view, stand anything from her child, and the good father will stand a relationship in which mother and child are all in all to one another and from which he (for what, it is true, is called "a short period") is totally excluded. These expectations are contrary to experience

All the same this pamphlet throws many flashes of light on a dark subject Both Dr Winnicott and the British Broadcasting Corporation are to be congratulated on their courage in making this heroic effort

Elsevier's Encyclopædia of Organic Chemistry

Editor F RADT Series III *Carboisocyclic condensed compounds* Volume 12B *Naphthalene and its derivatives* Amsterdam Elsevier Publishing Compy London Cleaver Hume Press 1949 Pp 344 [illegible] for the whole work

IT is stated that this encyclopædia will run to some 25,000 pages in about 40 parts Vols 14, 13, and 11 have already appeared, and after 12B is completed vol 1 will follow and then the remainder in order The present part of vol 12B deals with naphthalene and its derivatives and is itself divided into two parts. The first is concerned with the hydrocarbons—naphthalene and its hydro derivatives and derivatives of these with side-chains, while the second deals with the halogen-substituted compounds Published work is covered up to 1944, but in addition work on the structure of compounds has been brought up to 1948 There is a subject and a formula index, references are given in lists which are easy to find, and a good point is that the structural formulæ of naphthalene and tetralin, with the positions numbered, are printed at the top of each left hand page Some practical investigations have been made to clear up discrepancies in the literature, and the results are included in this number

Das chronische cystische Hydrom der Dura

in seinen Beziehungen zum sogenannten chronischen traumatischen subduralen Hämatom und zur Pachymeningitis hamorrhagica interna im Lichte der Relationspathologie ALFRED BANNWARTH, Dozent Dr med habil München Stuttgart Thieme 1949 Pp 57 DM 9 60

THIS rather prolix monograph is an attempt to establish a common relation between the conditions known to English speaking surgeons as subdural hydroma, subdural hæmatoma, and pachymeningitis hæmorrhagica interna Dr Bannwarth first presents three cases of subdural hydroma which he has seen personally, with brief references to previous reports He then discusses the pathology of this and the other two states, rightly emphasising that subdural hydroma may be a complication after evacuation of a subdural hæmatoma He suggests that the three conditions are stages in one pathological process, the basis of which is pericapillary exudation within the layers of the dura, beginning as *peristatischen Hyperämie* He believes that these conditions are an intradural reaction to trauma, toxins and other agents Unfortunately, there are no histological illustrations to support this view, and in the absence of such evidence the thesis will not find wide acceptance among British surgeons

Principles and Practice of Plastic Surgery

ARTHUR JOSEPH BARSKY M D, D D S attending plastic surgeon, Beth Israel Hospital, New York London Baillière, Tindall & Cox 1950 Pp 499 76s 6d

BEFORE the war the books available on plastic surgery were few in number, and one by Dr Barsky, published in 1938, was a valuable guide to the methods then in use in the United States He has now given us a newer and bigger book, containing almost twice as much material. An important addition is a separate chapter on the hand The matter is well presented and the text easy to read though it is doubtful whether the division of the page into two columns is an improvement The line diagrams are clear and pertinent, and the photographic reproductions good Dr Barsky has described those methods of treatment that he has found most satisfactory, and this is infinitely better than a catalogue of possible methods A sound presentation of the subject consequently emerges

THE LANCET

LONDON · SATURDAY, JULY 8, 1950

Expensive Prescriptions

It is a fundamental principle of sickness insurance that those who have no need of the physician should pay for attention to the less fortunate, but this provides no sanction for extravagance in furnishing drugs and other material aids to treatment There is unfortunately no magic which will entirely insulate a national service from the hard realities of the national budget, and during the past year it has been made clear that no more money can be voted for the National Health Service, and consequently that overspending on any one of its branches will have to be offset by restriction on others In this context, the report of the joint committee on prescribing, summarised on another page, is of interest to all concerned in the service, for there is reason to believe that money is being wasted on drugs which could be better spent elsewhere

The committee very rightly insists that there should be no absolute ban on any kind of prescribing the doctor must be free to prescribe whatever he thinks necessary, though on occasion he may be required to justify his action to his local colleagues The committee decided against drawing up any black-list of proprietary or other preparations whose prescription would lead to inquiry, and it was at first dubious even about the propriety of having a list of preparations which the practitioner could prescribe without risk of questions later In its first report, therefore, it merely recommended that a letter should be sent to doctors expressing concern at "the high cost of the pharmaceutical services, particularly where caused by the prescription of expensive brands of proprietary drugs," and asking for the coöperation of the profession to prevent excessive prescribing But at the same time it decided (by a majority) that steps should be taken to compile a list of "approved drugs," and it now suggests that for this purpose proprietary preparations could suitably be classified into six categories Apart from those in the two lowest, which comprise remedies of "doubtful value," it sees no *medical* reason why these preparations should not be freely prescribable in the National Health Service—unless they are advertised direct to the public, in which case they should not appear in N.H.S prescriptions Moreover "new drugs of proved value not yet standard" should be freely prescribable without reservation. But the committee, while it does not regard itself as competent to advise on the question of cost, thinks that those proprietary preparations which it regards as "not therapeutically superior to standard preparations" should be prescribable only if satisfactory arrangements for price are made between the health departments and the manufacturers The committee is prepared, if asked, to continue its work of classifying "such proprietary preparations as are referred to us" into the six categories This arduous task would necessitate the collection of all relevant information and a study of each preparation individually—a labour recalling that of SISYPHUS and of HERCULES in the Augean stables

For the sake of the service it is urgently necessary to make economies in the use of drugs, and it is obvious that a considerable saving could properly be made on proprietary preparations, which at present account for over 30% of the total cost Undoubtedly a great many unnecessarily expensive preparations are ordered because doctors are ignorant of the official equivalents, and, though the preparation of an "approved" list has its disadvantages, it would be welcome to many practitioners as a guide Many drug firms perform an important public service, and so long as we depend on them to develop new remedies we must not make it impossible for them to earn profits which finance the expensive research they undertake But anyone who is anxious to see the limited funds of the N.H.S used on essentials must be distressed by merely casual expenditure on remedies which are obtainable more cheaply under another name It would be wrong for any practitioner to feel that he cannot prescribe what is necessary, or for any patient to fear that he will receive an inferior or ineffective drug But the service cannot afford to waste money on names, and it is right that doctors should have their attention frequently drawn to the existence of official alternatives to many of the branded drugs which they are accustomed to prescribe The committee's moderate report with its emphasis on reasonable persuasion, represents the right approach to a complex problem.

Intermittent Claudication

INTERMITTENT claudication is a limping or lameness which appears after walking a certain distance It is caused by pain of a particular type, usually at first a dull ache or tightening, and becoming intense cramp like, or gripping The patient is compelled to stop walking, but after a rest the pain wears off and he can go a further distance LEWIS[1] and others showed conclusively that this pain is caused by the accumulation in contracting ischæmic muscle of a factor which stimulates sensory nerve-fibres In peripheral vascular disease muscle ischæmia is produced by general arterial narrowing and by local thromboses The site at which pain is felt depends on the muscle or muscle group which is maximally affected in relation to the work which the limb is performing The muscles most commonly affected are those of the calf, but it is not uncommon for a patient to complain of pain in the front of the leg in the thigh, or in the foot, and in the foot it is important not to mistake pain from this cause for that from foot-strain, flat-foot, or other purely local disorders A careful history and examination will elicit the characteristic features and time-relations of the pain, and usually other evidence of vascular insufficiency.

1 Lewis T Pain New York 1942.

Prof A M BOYD and his co-workers [2] have given an account of their enormous experience of this disease at the peripheral vascular clinic of Manchester Royal Infirmary They divide claudicants into three clinical types, representing three grades of severity In type 1 the pain appears on exertion but disappears on further walking Here the pain factor starts to accumulate and for a short time rises above the "pain threshold level", but the vessels are still capable of sufficient dilatation to remove it, and the pain passes In type 2 the pain appears and remains at a steady level of intensity as the patient continues to walk indicating that, once the threshold of pain has been passed, a state of equilibrium is reached in which the pain factor is removed as fast as it is formed In type 3 very little vasodilatation is possible, and the pain increases steadily until it becomes unbearable and the patient is forced to stop To measure accurately the distance at which pain appears, it is usually necessary to observe the patient walking, and to assess the clinical type and extent of disability, he must be exhorted to keep on walking for as long as he can A patient who has been resting in bed for a week can often walk very much farther before he feels pain than when he has been up and about

BOYD believes that intermittent claudication is caused by three main types of peripheral vascular disease The commonest is "senile obliterative arteritis," or arteriosclerosis in its widest sense Almost all arterial disease developing after the age of 35 is of this type, which is also not uncommon below the age of 30 Many cases that are labelled "Buerger's disease," or thromboangutis obliterans, are in fact cases of frank atheroma This is not the orthodox teaching, but other workers in this field who follow up their patients carefully are coming to similar conclusions The disease may affect principally the large or the small vessels, and secondary thrombosis may take place in the popliteal or, less commonly, in the femoral artery The second type is primary thrombosis of the popliteal artery This is not common —in BOYD's series it accounted for only 6 out of 472 cases of obliterative arteritis—but it is important to recognise the condition, because it is not a manifestation of generalised arterial disease with a bad prognosis for life and limb, but a purely localised traumatic phenomenon It is found usually in men under 35 years of age and gives rise to intermittent claudication in the calf The thrombosis starts at the point where the popliteal artery enters a fascial tunnel behind the knee joint, and spreads for a short distance up or down It seems to result from the normal movements of the knee, sometimes without any special trauma Arteriograms show no abnormality except in the affected segment, and no sign of inflammation is found in excised portions of the thrombosed vessel This condition, too, is usually mistaken for Buerger's disease

If, then, some of the cases which we commonly call "Buerger's disease" are in fact arteriosclerotic, and others are examples of primary popliteal thrombosis, can any be regarded as examples of true thromboangutis obliterans? BOYD describes eight cases of "juvenile obliterative arteritis," which, he believes, forms a third distinct group The patients, all men under 35, were affected in both legs They had interdigital fungus infections and patchy phlebitis of the superficial veins The disease started distally, causing pain, ulceration, and gangrene of the toes and intermittent claudication in the small muscles of the feet It spread up the legs, causing obliteration of vessels and consequent ischæmic changes, and one or both limbs were lost within 3–5 years of the onset The pathology of this condition is not clear BUERGER [3] described certain inflammatory changes in the vessel walls, including pronounced perivascular fibrosis BOYD, however, points out that not only are similar changes seen in and around the vessels of infected arteriosclerotic limbs, but that in juvenile obliterative arteritis the arteries above the level of the disease show little abnormality Possibly the fungus infection of the feet, spreading up the perivascular lymphatics, accounts for the whole clinical picture It remains to be seen what happens to these patients in the future, and we shall be interested to hear whether or not they develop lesions in the hand the coronary or cerebral vessels, or elsewhere Not everyone will be satisfied with BOYD's classification, because there are still cases which cannot easily be fitted into any of his three groups, and probably most people see a greater proportion of cases that do not appear to be arteriosclerotic

Happily, in the treatment of peripheral vascular disease the emphasis has shifted from the management of gangrene to the control of early symptoms and the prevention of gangrene In intermittent claudication the aim is to improve the blood supply of the ischæmic muscles by opening up collateral vessels The problem however, is not simple, and other factors must be weighed, including the clinical type, the patient's age, the nature of the arterial disease, the prognosis for life and limb, associated disease, and domestic and economic conditions Type 1 claudicants do well with almost any method of treatment, provided their confidence is gained In type 2 the standard procedure is lumbar sympathectomy (removing ganglia one to three), which nearly always improves the nutrition of the foot and sometimes relieves the claudication significantly BOYD finds that 70% are able to walk one mile without pain and that the result improves with time Not everyone would claim such good results, in particular, some patients complain that after initial improvement their pain returns Where unilateral pain, confined to the calf, is not dispelled by sympathectomy, BOYD's operation of subcutaneous Achilles tenotomy is invaluable The rationale is that if the tendon is divided the calf muscles are not used in walking, no pain factor is produced, and claudication does not occur Patients quickly learn to walk without using the calf muscles, and soon can cover long distances without pain In type 3, sympathectomy does not improve the claudication, and tenotomy is the treatment of choice, but sympathectomy is advisable as well if the limb itself is in danger In senile obliterative arteritis the danger to life is usually greater than the danger to limb, and angina of effort coronary thrombosis, and hypertension are contra indications to lumbar sympathectomy In particular if high blood pressure is lowered, thrombosis and gangrene may actually be precipitated Nevertheless lumbar sympathectomy is now a very safe procedure

2 Boyd A M. Ratcliffe A H Jepson R P James G W M. J B Surg 1949 31B 325

3 Buerger L Amer J med Sci 1908, 136 567

and in BOYD's series there was only 1 death in over 300 operations, both sides can be done at one time, and age alone is no contra-indication Paravertebral sympathetic block with a 10% aqueous solution of phenol[4] is an effective method of performing a "chemical sympathectomy," though the technique is not easy This is a useful procedure for patients who require sympathectomy, but in whom there are contra-indications to operation Of the various drugs which have been tried at the Manchester clinic the only one which has given encouraging results, as regards both claudication and nutrition of the leg, is vitamin E by mouth The optimal dosage is 400 mg daily, and benefit is usually observed within 6–8 weeks Further work is being done to assess the real value of this substance

Peripheral Neuritis and Bronchial Carcinoma

To the many causes of peripheral neuritis another must, it seems, be added—bronchial carcinoma In 1948 DENNY-BROWN[5] described two cases in which these two disorders were associated, in each the neuritis was the presenting feature and the carcinoma was discovered only post mortem In both these cases the peripheral neuritis was unusual in that the sensory elements were greatly affected, with relatively little motor involvement Pathological examination showed extensive changes in the cells of the posterior-root ganglia with degeneration of the posterior roots and of sensory fibres in the peripheral nerves There was little apparent change in motor fibres but in both cases there were changes in the muscles, thought to be a primary degeneration of muscle fibres WYBURN-MASON[6] reported the same two cases and added a third in which the clinical involvement was motor rather than sensory and pathological examination revealed degenerative changes in the anterior roots and motor fibres of the peripheral nerves

LENNOX and PRICHARD[7] have now described two further instances of this strange association. In both the neurological symptoms improved for a time, but a severe relapse preceded death. Clinically, motor elements of the peripheral nerves were predominantly affected, at necropsy in one of the cases there was demyelination, chiefly of motor fibres, in selected peripheral nerves, while in the other there was no definite pathological change The posterior-root ganglia were not examined, but severe degenerative changes are unlikely to have been present in these ganglia because the posterior columns of the cord were unaffected LENNOX and PRICHARD found records of three further cases of bronchial carcinoma associated with peripheral neuritis, and in these three also, the presenting symptoms had been neurological.

The important question is whether this association of peripheral neuritis and bronchial carcinoma is more than accidental. DENNY-BROWN, impressed by the unusual clinical and pathological features of the peripheral nerve disorder, concluded that the two diseases were intimately connected but in the other cases that have been reported this unusual type of sensory neuropathy has not been found, the nerve involvement being mainly of the motor element LENNOX and PRICHARD's cases were 5 among 299 of bronchial carcinoma, and that the association is not fortuitous is strongly suggested by their review of the incidence of peripheral neuritis in cases of carcinoma at other sites and of other types of chronic chest disease From the pathological studies it is evident that the peripheral nerves and spinal roots have not been directly involved by neoplastic tissue, and the pathogeny of the peripheral nerve disorder remains obscure WYBURN-MASON suggested that there was an analogy with hypertrophic pulmonary osteo arthropathy, and that the disturbance of neural function was produced "reflexly" from the lungs DENNY-BROWN pointed out the resemblance between the posterior root ganglion degeneration in his cases and that in the ataxia of swine when these animals are fed on a diet deficient in calcium pantothenate and pyridoxine[8], and he postulated that the cause was a metabolic disorder related to the tumour cells

This association of diseases indicates the importance of radiography of the chest in cases of peripheral neuritis of obscure origin, and it will be interesting to study the course of the neuritis if a case is found in which the bronchial carcinoma can be removed completely

4 Haxton, H. A *Brit med J* 1949, i 1026
5 Denny Brown D *J Neurol Neurosurg Psychiat* 1948 11 73
6 Wyburn Mason R *Lancet* 1948 i 203
7 Lennox B Prichard S *Quart J Med* 1950 19 97
8 Wintrobe M M., Follis R H Stein H. J Mushatt C, Humphreys S *J Nutrit* 1942 24 345

Annotations

DISSATISFIED PRACTITIONERS

LAST week the Conference of Local Medical Committees met to discuss the negotiations on general practitioners' remuneration After emphasising that at no time, either before or since the appointed day, had agreement been reached on this subject with the Government, the conference proceeded to express its grave disquiet at the repeated hold ups and long delays in the negotiations The Minister of Health had avoided making any definite reply when asked by the General Medical Services Committee what sum he thought should be in the central pool to implement the recommendations of the Spens report The conference believed that he had all the data needed to make this calculation, and it pressed for an immediate statement It was also disturbed at the suggestion, implicit in some of the correspondence with the Ministry, that future negotiations on general practitioner remuneration need not necessarily be conducted through Whitley Council machinery

Because of its dissatisfaction with the present remuneration and with the inconclusive negotiations for its amendment, the conference proceeded to instruct the G M S Committee to make preparations forthwith for the termination of contracts by general medical practitioners It did not propose a date on which this collective termination of contracts might take place Such a date would be fixed at another special conference, to be called if it became obvious that there was no further prospect of a satisfactory settlement Unless a settlement is reached first, a conference will be called next December at latest

The Minister has recently proposed to the G M S Committee that he should, with the coöperation of the profession, undertake certain investigations into the actual earnings and expenses of practitioners during the year ended March 31, 1950 The conference considered this suggestion, and concluded that the chances of an

equitable settlement of remuneration might be increased by early and accurate information on practitioners' income from N H S sources, and on practice expenses Accordingly it was willing to participate

For the rest of its time the conference discussed and deplored the sinking status of the general practitioner, and urged the G M S Committee to do whatever it could to buttress and restore this status Just how it was to do so did not emerge very clearly, for the conference was unwilling to admit that the loss of status was associated with, or could solely be accounted for, by the hurried and harassed form of practice that an increased load of medical and clerical duties has thrust on many doctors It laid more stress on the gulf between the practitioner and the hospital, and felt that the practitioner should be afforded much greater clinical and administrative contact with his local hospitals and their management committees One practical proposal came from Buckinghamshire, whose representative had been encouraged by the initial success of discussions between the Oxford Regional Hospital Board and representatives of all local medical committees in the Oxford region (see p 65) He put forward the suggestion, which was accepted by the conference, that local medical committees should themselves form a joint committee over an area corresponding to that of a regional hospital board, and should seek through this joint committee to keep in regular touch with the board

THE INFECTIOUS TUBERCULOUS

LIKE every other infectious disease, tuberculosis presents two problems—care of the patient, and protection of the rest of us If it is to be brought under control, neither aspect can be ignored [1] In our correspondence columns, Dr Grenville Mathers and Dr Trenchard note that the National Health Service Act focuses attention on treatment, and essentially on the treatment of those who can profit by it But even this is not done well, the patient waiting for a bed may pass from the hopeful to the hopeless class before he gets so much as the chance of treatment Moreover, as our correspondents point out, about a quarter of the pulmonary tuberculosis patients known to the chest clinics who are not in hospital have positive sputum, and they are actually discharged from sanatoria in this dangerous state, simply because there is nothing else to do with them What becomes of them then? They do not easily find work, and if they are only to be admitted to ordinary employment on condition that they disclose their disability to their employers, as the Joint Panel on the Resettlement of the Tuberculous have recommended, they will find it hard to get a job at all Even as it is they are apt to become derelict, the health committee of the London County Council note [2] that in London alone, there are at present some 160 of them living at close quarters with uninfected people in common lodging houses The situation is intolerable for them in their sanatoria no doubt, they were taught that they were a danger to others, but what can they do about it? When society prescribes duties and withholds the means of fulfilling them, even the most law abiding transgress, as anyone who tries to park a car in London knows These patients must be given some measure of shelter and help, not only on their own account but in the urgent interests of the whole community

The L C C has for some time contemplated building night sanatoria in which such patients might live under medical supervision, and from which they could go out to work, perhaps under sheltered conditions Before the Act came into force arrangements used to be made for some of them to enter small voluntary sanatoria This was not in our view a satisfactory solution, for such sanatoria found great difficulty in getting staff We know of places where girls of 15½ or 16 were employed, and some of these died of tuberculosis or were crippled by it Since the Act came into force, the regional hospital boards, according to the report of the L C C health committee, have been unable to provide accommodation for irremediably open cases, and take the view that these cases are not their responsibility Meanwhile the health committee have been looking for suitable quarters for hostels or night sanatoria, so far without success, moreover they feel that the regional hospital board should properly be taking the responsibility, especially since a patient needing urgent treatment could be transferred to hospital much more readily if he was in a hostel controlled by the board. The job is so urgent, however, that the health committee feel it matters very little who does it as long as it gets done, and they intend to send a deputation to ask the Minister of Health where the responsibility lies They have already made one important proposal to him—namely, that St Peter's Hospital, Stepney, should be pulled down and the site used for a night sanatorium, and for industrial workshops which would be run in collaboration with the Disabled Persons Employment Corporation The Minister was unable to approve the necessary expenditure for this project, but the need is so great that the committee intend to raise it again with him Indeed, night sanatoria are needed throughout the country They could receive patients who would otherwise not be discharged from sanatoria until later, and so might greatly relieve the pressure on treatment beds If the Minister were able to arrange for the admission of tuberculous patients to a proportion of general hospital beds (p 70) this pressure might well be removed altogether, and we should have better prospects of controlling the spread of tuberculosis than we have ever had in our lives

THE CHILD AND HIS HEREDITY

As infant deaths go down the proportion due to congenital abnormalities rises, according to Dr Fraser Roberts, speaking at the annual conference of the National Association for Maternity and Child Welfare, these now account for 1 infant death in 6, and are five times commoner as a cause of mortality than they were in 1900 In one way this is good news, because it means we are approaching the irreducible minimum—irreducible, that is, by ordinary medical, social, and eugenic measures. On the other hand, it means we are getting no nearer the prevention of such congenital defects, which are responsible not only for deaths but also for much unavoidable disability in infancy and childhood In 1937, he said, among children of school age 37 per 100,000 were blind, a third of them from congenital defects of vision, in 1948 the incidence had fallen to 21, but two thirds of the cases were congenital in origin If the average age of mothers could be reduced by 5 years, this incidence of congenital malformations of all kinds, he stated, would be cut by about half Meanwhile our growing knowledge of heredity can often be used to guide those parents who have had a congenitally malformed child In many cases it is possible to predict whether or not other children in the family are likely to be affected, and the parents can sometimes be told the exact chances against their having another defective child. Again, many malformations and abnormalities—such as hare lip or club foot—can be repaired or treated. In the case of the rhesus factor, 1 child in 150 is born with hæmolytic disease, because he has inherited from his father an antigen not present in his mother, and up till 10 years ago half these children died Now that appropriate transfusion can be begun at birth, the death rate has fallen to a tenth It is also becoming possible to predict which people, for genetic reasons, are unduly susceptible to

1 *Lancet*, July 1 1950 p 21
2 L C C Agenda Paper no 2 July 4 See also p 70

ven diseases, and to ensure their protection or early eatment Heredity is an important factor in deciding hether a person contracts tuberculosis or not, and isceptibility to rheumatic heart disease may also be redictable Children born with a predisposition to equire these disorders can already be protected to some xtent, and as our knowledge grows we may discover ow to make them proof against their opponents He alled such achievements "positive eugenics"

DICK BARTON AS A MORAL FORCE

LIKE Socrates, Dick Barton has had to face a charge f corrupting the young Some, even, have blamed the amous radio detective for a share in the rise in juvenile lelinquency—not because he favours lawbreakers (he s inveterate in the cause of right) but because he is not oo particular about borrowing their methods The harges against him have lately been investigated by the "audience research" department of the British Broadasting Corporation, with the help of the National Association for Mental Health Questionaries were sent to the medical directors of 115 child guidance clinics, and 85 replies were received from some 80 clinics scattered over the country A report on these replies was prepared by Miss Cicely de Monchaux, lecturer in psychology at University College, London It seems that nine out of ten of those who answered had themselves heard at least one episode in the Dick Barton serial, and one was a regular listener, because—he said—an up to date knowledge of Barton's doings helped him to make touch with child patients Only half of those replying had any evidence of the effect of the serial on children, and only a quarter thought that listening to Dick Barton made it harder for delinquents to resist temptation A very few (6 against 76) thought there would be less delinquency if the series was brought to an end The ultimate fate of the serial was not, on the whole, a matter of keen interest to child guidance authorities Just over half felt that, from the standpoint of mental health, it should be discontinued or modified in some ways, but if they had to decide its fate 51 would vote for its continuation and 24 against it

Many thought that the Dick Barton adventures supply the fantasies which children need as an emotional outlet for aggression, but in their present form they are "just an outlet" The serial might be used, it was suggested, to serve higher ends This, however, would have to be done with a singularly light and expert touch, since children do not care for outspoken "uplift" in their entertainment any more than the rest of us In one of Saki's tales, recently read over the air, a little girl hiding from a wolf was discovered and eaten up because her good-conduct medals clinked and gave her away—a catastrophe which the children listening to the to the story thought (according to Saki) completely just Real children are probably rather less ruthless, though they like the wicked characters (i e, those with whom they do not identify themselves) to come to a bad end But Saki was right in thinking they are disgusted by a prig Most of those who listen to the Dick Barton series are aware that their hero—like Robin Hood, and other violent characters in their gallery—is, without priggishness, on the side of virtue Only the dull are likely to miss this Those who are antisocial already may borrow from Dick Barton, not criminal aims (of which he is free) but—possibly—criminal or violent methods Nowadays, unfortunately, they are likely to hear of these even more freely in real life than in fiction Theoretically it might be a mistake to reinforce ugly fact with fantasy in this way, but in practice children seem to need adventure stories much as they need vitamins For most of them such listening is not a prelude to crime but a means of relieving tension A parallel is to be found in the cinema, which is often blamed for antisocial training of the young, but the departmental committee[1] which recently reported on this question did not (with one dissentient) fasten on the cinema "any primary share of responsibility for delinquency or moral laxity of children under 16" It does more harm, they thought, by providing children with a set of false values in which riches, power, luxury, or public adulation are regarded as the greatest good, and by frightening the little ones The Dick Barton serial is also said to be too exciting for some children, and the suggestion was made that the rhythm of the episodes should not end on a crescendo, as they do at present, but should follow a low high low pattern The audience research report remarks dryly that if, after this and other changes, Dick Barton were Dick Barton no longer, "this would appear to be a consummation which informed opinion would face with equanimity" The sentence of these judges, which amounts to letting Mr Barton off with a caution, is perhaps vitiated by the average age of the bench, a symposium of juvenile, and even better informed, opinion might have resulted in acquittal

KHELLIN FOR CARDIAC PAIN

KHELLIN, an active principle of *Ammi visnaga* Lam, is reputed to cause active coronary vasodilatation without reducing the blood pressure or increasing the pulse rate[2] This drug has lately been tested by Rosenman and his colleagues[3] on 14 cases of angina pectoris, most of which had been observed for some years Khellin ('Visammin') was given usually for 3–13 weeks, and in one case for 40 weeks At other times a placebo was given, and at yet other times no treatment The number of trinitrin tablets taken daily by each patient under these three different conditions was estimated In 7 of the 14 cases the number of trinitrin tablets was substantially less with khellin than with a placebo or no treatment, and in 6 of these 7 cases capacity for exertion seemed to be increased—though this is perhaps only another and less objective way of saying that fewer trinitrin tablets were needed Khellin also produces bronchial dilatation, and the report contains an account of its use in bronchial asthma and chronic cor pulmonale

THERMAL COAGULATION OF SERUM

ABNORMALITIES in the blood proteins of patients with cancer have been described lately by Huggins and his colleagues,[4] who in this work have made use of thermal coagulation—a procedure which they claim to be simple and reproducible In 1918 Belak observed the constancy of the coagulation point of human serum, and in 1936 Glass noted elevation of the level in the serum of patients with cancer and also of others Last year Huggins and Jensen[5] found that the coagulation of serum albumin could be prevented by halogenated acetates, the most effective of these acetates was the iodine compound, which did not prevent denaturation but eliminated the association of denatured polypeptide chains It was then learnt that the serum of most patients with cancer, and of some cases of certain other diseases, required less iodoacetate to prevent coagulation by heat Defects in the coagulative capacity of a serum were measured both by the "iodoacetate index"—that is, by estimating the amount of the inhibitor required—and by the "least

1 Children and the Cinema H.M. Stationery Office 1950 see *Lancet* 1950 i 916

2 See Anrep G V Barsoum G S Kenawy, M R, Misrahy, G *Lancet* 1947 i 557 Annotation *Ibid*, p 682 Ayad H *Ibid* 1948 i 305 Davies J S H *Ibid* p 887

3 Rosenman R H Fishman, A P Kaplan S R Levin H G Katz, L N *J Amer med Ass* 1950 143 160

4 Huggins C Cleveland A S Jensen E V *Ibid*, p 11

5 Huggins C Jensen E V *J biol Chem* 1949 179 645

coagulable concentration value," which is arrived at by diluting a sample of serum until it is still just able to form a solid gel on heating Of the two methods, the second has proved the more satisfactory To express the values in terms of actual protein concentration, the least coagulable serum percentage is multiplied by the number of grammes of total protein in 100 ml of serum

In 109 healthy controls the lowest coagulable serum percentage varied from 14 to 21%, while the least coagulable protein concentration varied from 1 06 to 1 38 g per 100 ml In contrast to these presumed normals 113 consecutive cases of untreated early or moderately advanced malignant disease had concentration values from 1 17 to 2 47 g , and of the whole group, only 17 had values under 1 38 g In another group comprising 133 cases of diseases other than cancer, 88 fell within the range of normal Of 91 pregnant women 54 gave a value over 1 38 but in all cases the duration of pregnancy exceeded twelve weeks Thus, changes in albumin detectable by thermal coagulation are not specific for cancer Not only are these changes found in other diseases but they are associated with the latter two thirds of pregnancy, and they also arise after severe operations Huggins and his associates regard serum coagulation as a procedure supplementing the sedimentation rate, with which it has no true correlation So far as the iodoacetate index is concerned, Huggins, Miller, and Jensen [6] found it pathologically low in all of 85 consecutively studied patients with cancer which they describe as "clinically active," but in only 16 out of 95 cases of non malignant disease they conclude that the test although not to be regarded as a specific diagnostic measure for cancer, is nevertheless of use However less satisfactory results are now reported by Gilligan, Rothwell, and Warren [7] With this "Huggins" test positive results were recorded in only 72% of 54 cases of cancer , the remainder were all "active," and indeed some had large and inoperable tumours and evidence of metastases Moreover, high positive values were obtained in 42% of 107 cases of non malignant diseases, but some of these were chosen because they were febrile and thought to be likely to give positive values These authors conclude that the iodoacetate index, as related to the serum total protein concentration, while yielding useful information concerning a systemic effect of certain cancers, is not useful for the diagnosis of cancer However they found that in normal subjects it showed less overlapping with the results obtained in patients with cancer than did the test for the least concentration of heat coagulable protein, and the iodoacetate index as related to the albumin concentration of the serum Whether these further tests will be welcomed remains to be seen , at present the need is for more precise methods of rapidly estimating protein fractions in small quantities, rather than for tests which are mainly qualitative

Huggins et al.[4] also describe a qualitative test for gamma globulin, which consists in mixing 0 05 ml of serum with 0 95 ml of a buffer and heating in boiling water for two minutes A heavy cloud or the formation of solid particles signifies an abnormally high content of gamma globulin , in health, serum becomes only opalescent or slightly hazy This test was carried out on serum from 21 cases of multiple myeloma , 7 of the patients had Bence Jones proteinuria but in only 1 of these was the test positive By contrast, it was positive in 12 out of 14 patients with myeloma who had no demonstrable Bence Jones proteinuria This test appears, therefore, to be of value in the diagnosis of multiple myelomatosis in which there is hyper gamma globulinæmia without proteinuria

6 Huggins C Miller G M Jensen E V *Cancer Res* 1949 9 177
7 Gilligan D R Rothwell J T Warren S *New Engl J Med* 1950 242 807

ROYAL SOCIETY OF MEDICINE

SINCE the start of the late war the number of fellows of the Royal Society of Medicine has doubled, and fellows, members, and associates now total 9714, but growing popularity has not brought growing fortune in fact the subscription has had to go up to cope with the expanding demands, including the demand for more space One reason for the increase in members is the society's remarkably comprehensive library service, the council's report for the past year shows that the library now takes over 1400 different journals—a figure which illustrates the growing difficulty of being really well informed Furthermore, for those within reach of London the sectional meetings give useful demonstrations of the growing points of medicine During the past year fellows have refused to add to these sections one on hæmatology , the council is now being approached with a view to forming one dealing with the problems of general practice

At the annual meeting on July 4, Sir Henry Dale O M , F R S , the president, presented the society's gold medal to Prof E D Adrian, O M , F R S "Any physician or surgeon," the President remarked, "who deals today with nervous defects and disorders, finds that his resources of knowledge and of method depend in an ever increasing measure on Adrian's researches, which have already revealed so much concerning the functions, and especially the sensory and percipient functions, of the peripheral and central nervous systems, and are still progressively disentangling what a less courageous investigator might well have shunned as an intangible and baffling complexity "

Those lately admitted to honorary fellowship (some of whom were present at the meeting) are Prof Wilder Penfield, F R S (Toronto), Prof Gösta Forssell (Sweden) Prof Alfred Gigon (Switzerland), Prof B A Houssay (Argentine), and Prof Abdul Mooro Pasha (Egypt) Officers for the coming years are president, Lord Webb-Johnson , hon secretaries, Dr A T M Wilson and Mr J C Ainsworth Davis , hon treasurers, Mr L R Broster and Dr S Cochrane Shanks , hon librarians, Dr T C Hunt and Mr H J Seddon

Next year promises to be a busy one for the society, which has undertaken, in response to a request by the authorities, to arrange a series of special meetings in connection with the Festival of Britain These meetings are to be addressed, according to the council's report "by leaders in all branches of British Medicine, who will be asked to speak on those matters with which their names are internationally associated "

ETHICS AND THE SCIENTIST

SCIENTISTS have evolved an unwritten code of professional ethics Has the time come to state this code formally ? Pigman and Carmichael [1] believe that it has , and they suggest that scientific organisations, or some agency of UNESCO, should examine the application of scientific traditions to the new conditions of research 'A mere statement of principles would be of help An extensive codification and attempt to discipline or expose gross violations might be desirable "

THE following have been appointed honorary physicians to the King for three years from July 1

Dr SAMUEL BARRON, medical officer of health Belfast , Dr W E CHESSMAN, medical adviser to the Treasury , Dr S W FISHER, principal medical inspector Mines Department, Ministry of Fuel and Power , Dr ARTHUR MASSEY, chief medical officer, Ministry National Insurance , Dr R H PARRY, medical officer of health, Bristol, and professor of preventive medicine University of Bristol , Dr H J RAE, medical officer of health, Aberdeen, and counties of Aberdeen and Kincardine

1 Pigman W , Carmichael E B *Science* 1950 111 643

Reconstruction

THE OXFORD PLAN

General Practitioner and Hospital

A TALBOT ROGERS
M B Lond

COMMENTING a fortnight ago on the plight of the redundant registrars, THE LANCET said

> "The tragedy lies not so much in our inability to offer them consultant appointments as in our failure, so far, to provide conditions of general practice which will enable first rate men and women, with a high level of training, to enter it with interest and confidence A big step towards providing such conditions would be to create or restore numerous hospital appointments to be held by general practitioners

At least one regional board—that of Oxford—has been thinking along similar lines and has now begun consultations with representatives of executive councils and local medical committees in its region to see whether ways can be devised whereby the talents and experience of suitable practitioners can be used to full advantage

This is a very welcome step, for success here could contribute to the solution of several of our most pressing professional problems It could provide posts where the well trained ex registrar could find a congenial life in general practice, it would enable consultants to unload some of their routine and time-consuming duties and devote a greater proportion of their available time to more specialised tasks it would tend to close the gulf that is widening between the general practitioner and the hospital, and by so doing it could help to raise again the declining status of the general practitioner

'AREA DEPARTMENT TEAMS"

The memorandum circulated by the Oxford Regional Hospital Board as a basis for discussion aims at 'bringing the general medical practitioner into a more satisfying (to him) relationship with the hospital service by giving him within the hospitals themselves, status and work appropriate to his qualifications and experience," while, at the same time ensuring that the practitioners do not undertake such tasks as acute general or special surgery "otherwise than as members of area department teams under the supervision of consultants"

This conception of the "area department team," is the key of the Oxford plan "Under this plan all those working in a particular branch of medicine or surgery in a given area will become members of a team—the area department of medicine, or surgery, or obstetrics, or ophthalmology, as the case may be Each team or department would include, not only the consultants and senior-hospital medical officers graded in that specialty, but also general practitioners in that area qualified or experienced in the particular specialty and willing to undertake work in it under the general supervision of the specialist staff The precise method of achieving this objective is for discussion, but it might, for instance, be arranged that those who were willing to do so might be given some position analogous to that of clinical assistant (though given, perhaps, some other title) in the key hospital of the area, combined with an appointment to the staff of a smaller hospital in their own area where they would undertake such work as might be delegated to them by the specialists, who would retain clinical responsibility for the service in the area"

This is a grand conception and by no means an impracticable one On a smaller scale it is already working in a few general hospitals, and experience there has shown that such a system can function happily and to the mutual advantage of the consultant, the general practitioner, and the hospital

A PRECEDENT

As a general practitioner, I have myself had the advantage of working in a hospital which has, in recent years, progressed from having only a general practitioner staff, with limited consultant help, to being staffed by regularly attending consultants in almost all specialties, who now take clinical responsibility for all the patients On the change over, room was found to include in the establishment of the hospital those general practitioners who had the desire, the necessary experience, and the time, to become members of the different consultant teams Under our arrangement not more than one general practitioner is attached to each consultant, he occupies a position somewhere between the consultant and his house officer (akin to that of a first assistant in a teaching hospital firm), he accepts the duty of attending the hospital whenever his chief is there (whether in the wards, the theatres, or the outpatient clinics), and he attends on other days also, to keep a watch on the progress of the patients and to be available to give advice or assistance to the house officers In hospitals where the visiting consultant can make no more than one or two visits in the week, and where most house officers are relatively junior, the continued employment of an experienced practitioner, who soon learns the ways and wishes of his chief, provides a most valuable and unchanging unit in the specialist team, it facilitates holiday arrangements, and makes sudden absences through sickness or other unpredictable cause much less disrupting

So far as my own hospital is concerned the experiment has now proved its worth over four years, and a recent resolution from the hospital staff committee to the management committee said that if it were ever decided that the general practitioner help was to be withdrawn, the present work of the hospital could not be continued without a larger establishment of registrars or of junior consultants The Oxford plan broadens our experiment, and, by applying it to a group of hospitals in an area, offers still greater opportunities for cooperation between the specialists themselves and between them and their colleagues in general practice It should allow of greater flexibility and easier adaptation to local needs and to the local availability of suitably experienced general practitioners Besides the specialties mentioned by Oxford, our experience has shown the usefulness of general practitioners also in the departments of pædiatrics, dermatology, orthopædic and traumatic surgery (particularly for plaster work), physical medicine, and anæsthetics There is undoubted scope for them likewise in the care of the aged sick.

DIFFICULTIES

But before wide use can be made of practitioners in this way, we shall have to solve many practical problems Some of these concern the executive councils and the local medical committees as much as, or more than, the regional board, and they demand joint consultation of the kind Oxford proposes

To begin with, this is a selective scheme, aimed at employing only a proportion of the practitioners—those with special experience—as units in specialist teams It is not, and can never be, a substitute for the provision of general practitioner beds available for all general practitioners to treat those patients whose need is for nursing care rather than for specialised medical help Such beds would still be needed even if the Oxford plan were successfully and widely applied

As to selection, the Oxford memorandum says "where the general practitioner already has hospital attachments, the problem is not only to ensure that he continues to do so, but also to take care of the position when the time arises for the executive council to appoint a successor in his practice" It goes on to insist that the regional board has a duty to ensure that the quality of the staff it employs is adequate to the tasks entrusted to them, and to suggest that there should be joint action in the filling of a practice vacancy which might involve the chosen practitioner's appointment to an area department This should not be a difficult point on which to obtain agreement, and cooperation, as well with the Medical Practices Committee as with the executive council The executive council that cares for the quality of service it provides in its area should welcome any opportunity that is offered for obtaining experienced doctors, and by permitting their continued association with hospital work, for keeping their specialised skills from growing rusty

Nevertheless it will still have a first duty to see that the general medical services provided for the patients on the doctor's list are not hopelessly hurried or scamped because the doctor is choosing to devote an undue proportion of his time to hospital work The conflicting calls of the two parts of the service have to be met, and it is obvious that a doctor who undertakes to give a regular proportion of his time to the hospital must expect to limit in proportion the number of patients whose care he undertakes In practice a rough and ready ratio is that for each weekly half-day of hospital service, the practitioner's list needs to be reduced from the permitted maximum by some 500 patients Some latitude should be given to allow for the help that a practitioner may be receiving from a partner or an assistant, which may well enable him to give more service to the hospital without his practice suffering neglect The advice of the local medical committee on such points as this would be of great value to the regional board and should always be sought

Provided his practice commitments allow (not forgetting his maternity engagements if he is doing midwifery), it is desirable that the practitioner should undertake to spend two or three weekly half days at the hospitals in his group If he gives less time than this, it is doubtful whether he can retain the skill and experience which the regional hospital board can justifiably ask of him To devote this time will mean for many busy practitioners a drastic limitation of lists, which on balance will be financially disadvantageous to them, even though they are paid for their hospital duties at S H M O or "10B" rates There is little doubt that, in spite of this, there would at present be no shortage of applications from experienced established practitioners or well trained would be entrants to general practice, wherever a progressive regional board was willing to carry out a policy of area specialist teams

FUTURE RECRUITS

As for the future, even the more conservative plans for registrar establishment admit the need for a sharp pruning of their numbers, at some stage—preferably at the end of the middle period—so that an unduly large cadre are not kept in training as senior registrars with little hope of achieving full consultant posts If this process of reduction becomes the custom, there will always be an appreciable number of men and women seeking to enter general practice after they have completed three or four years of special postgraduate training The wide fulfilment of the Oxford plan is the only means of creating a pattern of general practice which they can be more than content to enter and sustain

Special Articles

ECONOMY IN PRESCRIBING

COMMITTEE'S INTERIM REPORT

In its first interim report, the joint committee on prescribing[1] set up, under the chairmanship of Sir Henry Cohen, by the Central Health Services Council, recommended that practitioners taking part in the National Health Service should be sent a letter urging economy in prescribing This recommendation was accepted[2] In its second report,[3] which has also been accepted, the committee goes some way towards defining acceptable preparations

In the National Health Service practitioners are required to order "such drugs and prescribed appliances as are required for the treatment of any patient" When, however, it appears to the Minister that there is prima facie evidence that the cost is unreasonably large, he may refer the matter to the local medical committee and if the doctor's explanation to that committee is unsatisfactory, he may have a sum withheld from his remuneration (In Scotland the initiative for investigation rests with the local medical committee.)

The joint committee agreed at the outset that "there should be no absolute restriction on the prescribing by a general practitioner of any drug which in his opinion was necessary for the treatment of his patients" Thus, whatever classification were made, practitioners should not be prevented from going beyond its bounds, though they might have to justify their action to the local medical committee

A minority of the committee held that any list of drugs that could, or should not, be prescribed would be resented by practitioners and would foster a belief in the minds of the public that some drugs, however essential, could not be obtained under the service The majority thought, however, that practitioners would welcome guidance from such a list

The committee, with one dissentient, agreed that it was undesirable that medicinal preparations advertised direct to the public should be prescribable under the service It also agreed that all drugs and preparations described in the *British Pharmacopœia*, the *British Pharmaceutical Codex*, and the *National Formulary* (except those classified as foods, toilet preparations, or not drugs for N H S purposes, by the definition of drugs joint subcommittee) should be freely prescribable. These drugs and preparations are referred to as "standard" or "official"

The report divides proprietary preparations into the following six categories

1 New drugs of proved value not yet standard
2 Proprietary brands of standard drugs, singly or in combination
3 Standard preparations, and new remedies of proved value, in elegant form or vehicle
4 Qualitative and/or quantitative modifications in the composition or combination of standard preparations, or new remedies of proved value, which are not accepted as therapeutically superior to preparations included either alone or in combination in the *B P*, *B P C*, or *N.F*
5 Preparations not in the *B.P*, *B.P C* or *N.F* which in the committee's view have not been proved of therapeutic value
6 Preparations which are a combination of 4 and 5

It is recommended that proprietary preparations in category 1 should be freely prescribable, and that preparations in categories 2–4 should be prescribable subject to (*a*) their not being designated as foods, toilet preparations, or not drugs for N H S purposes by the definition of drugs joint subcommittee (*b*) their not being

1 See *Lancet* 1949, ii 805
2 *Ibid* 1950 i, 188
3 Central Health Services Council and Scottish Health Services Council Second Interim Report of the Joint Committee on Prescribing H M Stationery Office Pp 7 3d

ıvertised direct to the public, and (c) satisfactory rangements for price being made between the health partments and manufacturers The report concludes expressing the committee's willingness to classify dividual proprietary preparations according to these categories—a task which is expected to take some time

A copy of the report is being sent to all practitioners, ıd in a covering letter, Sir John Charles, chief medical ficer of the Ministry of Health, points out that "rather ore than 30% of the cost of medicines supplied to public atients is for proprietary preparations" There are, ı says, some proprietary preparations for which there e standard equivalents and which are more expensive ıan the standard preparations And he asks that

ave in any exceptional case where there is an overriding medical onsideration, doctors will seriously consider before ordering ıe of these proprietary preparations whether the alternative andard drug could not be ordered without detriment to the atient s condition. It will be appreciated that in many ıses preparations in this group are advertised direct to the ıblic.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

AT a dinner on June 27, to celebrate the 150th nniversary of the college s first Royal charter, the Duke of GLOUCESTER, an honorary fellow, recalled that he college was incorporated in 1800 by charter of King George III Queen Victoria had approved the institution f honorary fellowship to mark the centenary, and xactly fifty years ago—on June 27, 1900—King Edward VII became the first honorary fellow In this year's nniversary celebrations the first event—on March 20—had been the admission of the Queen to honorary fellowship

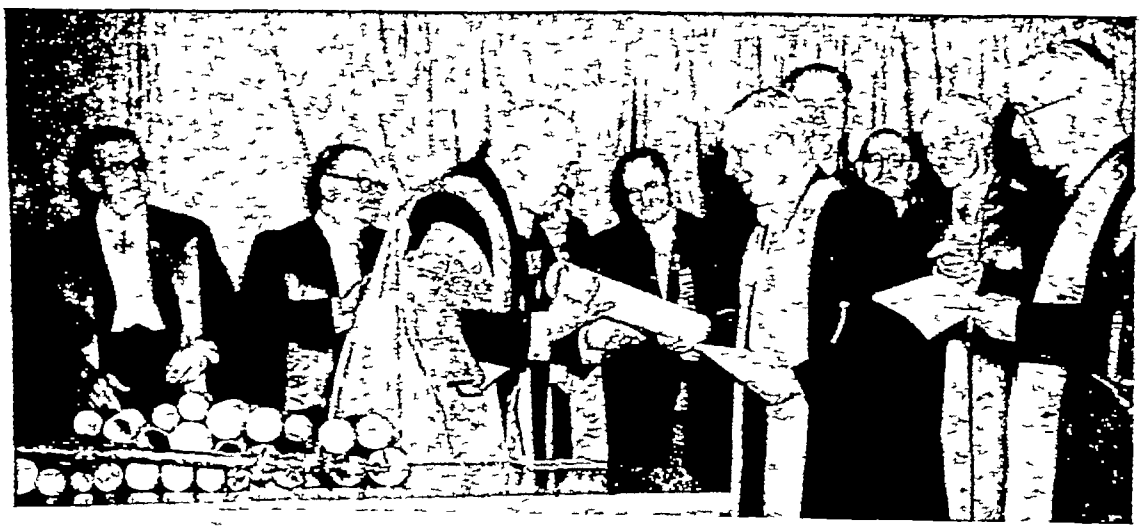
Sir CECIL WAKELEY, the president, replying to the oast of The College, proposed by Mr S C ROBERTS, ice-chancellor of the University of Cambridge, traced he history of the college in the past century and a half n the first hundred years it had progressed steadily as licensing body, with the institution of the fellowship n 1843, the licence in dental surgery in 1859 and the Conjoint Board in 1884 as the outstanding events In 909 the council agreed to admit women to the examinaions of the college—a decision taken with the support of the fellows but contrary to the majority view of the members The appointment, in 1908, of Sir Arthur Keith as conservator of the museum ushered in an era of greatly increased scientific activity During the presidency of Lord Moynihan (1926–32) the college adopted a wider outlook. Primary fellowship examinations were for the first time conducted overseas—in Canada in 1929 in Australia in 1931 In 1941 the building suffered severe damage by bombing, but within two months Lord Webb Johnson was elected to the presidency, and during his eight years of office the college, "still maimed, mutilated, and preoccupied with licking its sores, yet displayed a vigour incomparably greater than at any other period of its existence" In the present scheme for reconstruction and expansion—including the Nuffield College of Surgical Sciences—there was still no determined plan for the use of college property on the west side 'I wonder whether even now it is not too late to hope that our sister colleges may yet be our neighbours?"

Sir JOHN ANDERSON replied for The Guests to a toast proposed by Lord Webb Johnson, who paid tribute to those who down the years had aided the college Lord Webb Johnson expressed satisfaction at finding himself between the presidents of the two senior English Royal Colleges—with, as he put it, "Brain on the one hand and brawn on the other" Many he concluded, had felt that the Royal Colleges of England based on London, should coöperate more closely with the University of London, and it seemed that closer coöperation was near

At the dinner Sir HENRY NEWLAND for the Royal Australasian College of Surgeons, presented a silver tankard, and Dr LOUIS BAZY, for the Academie de Chirurgie, a medal, which were received on behalf of the college by the Duke of Gloucester

Before the dinner the president, accompanied by the council, received congratulatory addresses from the presidents, deans, or other representatives of the following bodies

Barbers Company (founded in 1308), St Andrews University (1411), Royal College of Surgeons of Edinburgh (1505) Royal College of Physicians of London (1518), University of Dublin (1591) Royal Faculty of Physicians and Surgeons of Glasgow (1599) Society of Apothecaries (1617) Royal Society (1660), Royal College of Physicians of Ireland (1667) Royal College of Physicians of Edinburgh (1681), London University (1836) Académie de Chirurgie (1843) Manchester University (1851) General Medical Council (1858), Royal College of Surgeons in Ireland (1874) University of Wales (1893), Birmingham University (1900), Leeds University (1903–04) Sheffield University (1905) Bristol University (1909) Queen s University, Belfast (1909) American College of Surgeons (1913), Royal Australasian College of Surgeons (1927) Royal College of Physicians and Surgeons of Canada (1929), and the Royal College of Obstetricians and Gynæcologists (1929); and also the British Postgraduate Medical Federation, and the medical schools of Guy s Hospital, King s College Hospital St Mary s Hospital, and University College Hospital.



Sir Henry Newland presenting the Australian college s address

Parliament

The Medical Bill in the Commons

IN moving the second reading of this Bill in the House of Commons on June 27, Mr ANEURIN BEVAN said that the Bill came from another place where a number of amendments had been accepted [1] He believed that there was general agreement with the main purposes of the measure, which did not set out to undertake a complete revision of the medical Acts The first purpose of the Bill was to improve the standard of medical education It provided that the student after passing his final examinations should be put on a provisional register until he had completed a period of intern service Mr Bevan pointed out that the General Medical Council still exercised some jurisdiction in relation to the Republic of Ireland, and it had been necessary to ensure that the new arrangements were acceptable to the government of the republic He was glad to say that complete agreement had been reached New South Wales and the Union of South Africa already had a compulsory intern service, but other countries with which we had reciprocal relations were not yet ready, and time for consultation and adjustment would have to be given before the new arrangements were enforced

The Bill also provided, Mr Bevan continued, for the visitation of the medical schools Power to give directions to the G M C in this connection had been given to the Privy Council This had been done because the Government were anxious to ensure that any influence over the academic side of medicine should be exercised by authorities like the Privy Council and the General Medical Council, and not directly by the Government This provision, he added, required no long advance administrative arrangements and should come into operation almost immediately

Mr Bevan then briefly outlined how the Bill altered the constitution of the G M C and improved the disciplinary machinery, giving the council power to take evidence on oath and to subpœna witnesses Another important provision was the right given to a doctor whose name had been erased from the Register to appeal to the judicial committee of the Privy Council. He commended the Bill to the House and hoped members would give it a smooth and speedy passage

Lieut -Colonel WALTER ELLIOT thought that the Bill was one to which the House would certainly give a ready assent As the Minister had pointed out, its main purpose was the improvement of medical education. Here the important step had been taken of recommending that an additional year should be added to the medical curriculum There was a danger, Colonel Elliot admitted, that the curriculum might be unduly prolonged He yielded to no-one in his admiration of the training which our hospitals gave to young graduates in their housemanship The great hospitals had the power to buoy up a man to an extent he never realised until he tried to tackle the problems on his own Housemen's posts would be difficult to get, and appropriate responsibility would be a difficult thing to devolute upon them The extra year would need to be looked at with great care to make sure that a sense of responsibility was really developed and that it was not merely used as a further occasion for learning

A DISSENTING VOICE

Dr H B MORGAN said he must oppose the Bill Three functions attached to the G M C First came the supervision of the *British Pharmacopœia*, which had been very well done But the second function—medical education—was very bad There should be in this country, Dr Morgan declared, a one portal system of entering the medical profession—one fixed standard for all students Then, if a man wanted to specialise he could do so by postgraduate courses He thought that in laying down a medical curriculum they should take note of the organisations, such as the colleges, which made no provision for training and were purely examining bodies, sometimes claiming revenue from those they deliberately flouted The Trades Union Congress, he continued, was very keen on medical education and wanted industrial medicine taught in the medical schools The T U C had asked the G M C to include this subject in the ordinary curriculum What had the medical schools done? Simply nothing In only three—Glasgow, Manchester, and Durham (Newcastle upon Tyne)—were there professors in that subject This Bill looked an innocent little measure, but at the back of it there were great powers against the democratic administration of medicine Suppose a man did not want to go into consulting, or even general, practice, was he still to be forced to attend for another year before registration Suppose he wanted to go into medical research, must he waste another year in a subject in which he was not interested? Dr Morgan added he would like to see the Bill reconsidered

Dr CHARLES HILL pointed out that Dr Morgan ignored the fact that the rôle of the G M C was to secure a minimum standard, and licensing bodies were left to apply a standard in excess of that minimum if they chose He sympathised with Dr Morgan's enthusiasm for industrial medicine, but he suggested that the part of the Bill which strengthened the power of the G M C in visiting medical schools would enable the Council to exercise a stronger influence over them. Dr Hill trusted that the proposed intern period would not merely add a year to the curriculum He hoped rather that this proposal would mean that towards the end of his career, when examinations were out of the way, the student was enabled to assume a post of some responsibility under supervision He hoped that the new posts would be designed in relation to the functions they had to fulfil It had been suggested that a good way of spending this last year would be for provisionally registered medical practitioners attached to a hospital to be allotted patients on their coming to hospital for treatment, and to follow those persons throughout the whole of their treatment back to their homes with a measure of responsibility for that treatment The full fruits of this important new development would only be secured if that year was related to a revised medical curriculum and special posts and the right kind of responsibility were created for the purpose He was glad that discipline was to be a matter not for the council as a whole but for a committee specially established for the purpose That would lead the council to think more and more about medical education. But he did not like the arrangement under which the penal cases committee could decide whether there existed sufficient evidence to justify the investigation of a case No person involved in the original assessment of cases ought to be a member of the disciplinary committee

Dr A D D BROUGHTON pointed out that the benefits to be derived from a period of postgraduate work under supervision in hospital were no recent discovery Many had taken advantage of it in the past, more were doing it today But some doctors had been denied that valuable experience by lack of funds This Bill might serve as a reminder that a course of training in medicine was a very long one, and that might lead in turn to a revision of the medical curriculum to allow the schoolboy to learn more about the arts before embarking upon years of intensive scientific study

SOME DIFFICULTIES

Surgeon Lieut -Commander REGINALD BENNETT agreed that a good deal of lopping was possible in the medical curriculum He had some misgiving that adultery should be the one type of civil case in which the G.M C disciplinary committee should not have power to call further evidence before pronouncing judgment

Mr SOMERVILLE HASTINGS welcomed the Bill because it made the education of British doctors, already the most practical in the world, even more practical (The trouble today was that there was too sharp a division between the time when as medical student the young doctor had very few responsibilities and never had to make decisions, and the time when he suddenly became qualified and found that the life and death of his patients depended upon his diagnosis, and sometimes even upon his treatment This Bill was good because it made the division between irresponsibility and responsibility gradual He accepted completely the general principles

1 See *Lancet* 1950 1 921 1015

the Bill, but he felt that thought should be given to e question how they could be carried out He could t see that there were enough suitable appointments interns to go round There were some hospitals here the young doctor would learn mainly what not do Again in teaching hospitals the physician or rgeon had often drawn to him cases of a special type, d those he treated usually by operations Such cases ight be relatively rare, and though of great importance, young doctor who went into practice might not be ely to meet many of them Therefore, while such pointments would be valuable for the training of ecialists, he did not think that they would be of much lue to the general practitioner Again there were fficulties in deciding whether a young doctor's work as satisfactory and there were difficulties in the case a physically handicapped person What about the an who had lost the whole or part of his hand? He rtainly could not be an efficient house surgeon or deed take an appointment as an obstetrician Yet e Bill said that such a man had to serve part of his me in one of these capacities Mr Hastings was glad at service in a health centre would do just as well as rvice in a hospital, but at present the health centres d not exist Moreover, while he agreed that to help n efficient doctor in a health centre would be most aluable training for a general practitioner, he felt that ervice in a special department in a health centre should nly count as training for a specialist

He was disappointed about the constitution of the G.M.C It had been generally recognised that it was afe to leave the conduct of most professions mainly in he hands of their members But here they had a G M C, which was to consist of 47 members, of whom only 11 vere to be elected by the profession Were doctors less esponsible than nurses? The Bill greatly improved he disciplinary procedure, but Mr Hastings would have iked to see some lesser penalty than being struck off the Register

Dr BARNETT STROSS thought the Bill a modest and unassuming measure, and there was nothing particularly handicapping in life about modesty But it had certain disturbing aspects Despite the suggestion that there vould be a year's extra work before full qualification, he word "satisfactory" was used and they would want o know what it meant They would also like to know whether, if the student was injured during his training, or if he fell ill, possibly with infantile paralysis, he was to be denied any opportunity of further work or of service with approved institutions They would want to know how long the student might have to wait for an approved post

Mr HUGH LINSTEAD paid tribute to the work which he G M C had done over years with an extremely clumsy machine which yet seemed to function with efficiency and justice The G M.C had been originally quite an appropriate body to supervise the production of the *British Pharmacopœia*, but with the passage of years they had handed the duty over to the Pharmacopœia Commission composed of one or two doctors, but mainly of chemists or pharmacists He hoped that the House would be assured that they were not crystallising by the chance reference in this Bill the existing method of producing the *Pharmacopœia*, which was by no means considered suitable in all quarters

Miss MARGARET HERBISON, joint under secretary of State for Scotland, replying to the debate, said there had been much criticism of the overloading of the curriculum in the medical schools and the debate might bear some fruit in that matter She thought that Dr Morgan was a little less than fair when he suggested that in our medical schools and universities almost nothing was done in industrial medicine The Government did not say that they were satisfied that what was being done was sufficient, but they were absolutely satisfied that the correct way of getting industrial medicine, or any other subject, into the curriculum was not by vesting power of direction in the G.M C This Bill provided that visitors not merely examined an examination but what really was being taught in the medical schools In this way it was hoped that the G M C would be able by persuasion, not by force, to make those changes in the curriculum which public opinion thought necessary

Replying to some of the points raised about the intern post, Miss Herbison said they would of course carry a salary A doctor on the provisional register would be able to sign a death certificate The suggestion that the year should be spent in general practice as a trainee assistant was contrary to the Goodenough recommendations, the views expressed by the G M C, and the practice in our Empire countries It was felt that the best experience could be got in hospitals and that it would be difficult to provide adequate supervision in general practice The Government suggested it would be better to see how the scheme worked in hospitals before any further extension was made for experience in general practice They were still leaving the intern period at 12 months but they could not at this stage say how soon they could make the figure work There might be difficulty in providing enough posts in Scotland, where a third of all our doctors were trained, but perhaps England would provide the beds for some of these

The Bill was read a second time

Midwives (Amendment) Bill

In the House of Commons on June 28 this Bill, which has already passed through the House of Lords, was considered on report Mr ARTHUR BLENKINSOP, parliamentary secretary to the Ministry of Health, moved an amendment making it quite clear that the midwife would have the full right to wear the new national uniform if she so desired, even though there might be an agreement with the local authority in regard to some locally designed uniform He said that this was a small matter and was limited by the Government amendment to domiciliary midwives The amendment was agreed to The Bill was read the third time and passed

QUESTION TIME

Pay of Specialists in Pensions Ministry's Hospitals

Sir IAN FRASER asked the Minister of Pensions when it was proposed to apply the scales of remuneration authorised by the Minister of Health to specialists employed in Ministry of Pensions hospitals —Mr H A MARQUAND replied The question of the remuneration of specialists in the Ministry of Pensions hospitals is being remitted to an independent committee set up in accordance with the recommendations of the Chorley report, which will review the pay and grading of all medical officers in the Civil Service Sir IAN FRASER In considering this matter will the Minister bear in mind that many of these specialists who are doing comparable work, are now being paid less than half what is paid to similar grades in the National Health Service, and that it is so bad that the *British Medical Journal* refuses to advertise for these grades? —Mr MARQUAND I am well aware of the situation, that will all be in front of this committee

Lieut Colonel WALTER ELLIOT Can the Minister say when he expects the committee to report? There is a serious drain on the service owing to the difference in the conditions between the two ministries —Mr MARQUAND I am not aware of any serious drain The committee is just commencing its deliberations, and it would really be for the Financial Secretary to the Treasury to answer questions about the date of the report

Smallpox Textbook

Mr S P VIANT asked the Minister of Health if, in view of the serious consequences which attended the accidental introduction of wrongly diagnosed cases of smallpox into general hospitals, he would consider issuing a textbook on the diagnosis of smallpox for the use of hospital doctors and also for medical students who were studying for the diploma of public health —Mr A. BEVAN replied I do not think it is within my functions to publish medical textbooks, but I will have the objective underlying the suggestion considered.

Allowances for Invalid Children

Sir RICHARD ACLAND asked the Minister of National Insurance what provision was made for children, or for parents of children, who were invalids from an early age and who ceased to be eligible for children's allowances on reaching the age of 15, and whether she would give an undertaking that the position of such children would be

considered when the present insurance schemes came up for general review —Dr EDITH SUMMERSKILL replied If through inability to attend school an invalid child has ceased to qualify for family allowances at age 15, his father, when not fully employed, may claim national assistance in respect of him At 16 the child may apply for national assistance in his own right The position of these children will be considered further in any future review of the schemes

Air-mail Envelopes and Eyestrain

Replying to a question, Mr NESS EDWARDS stated that one of the reasons for prohibiting the use of air mail envelopes with coloured borders was that the post office had been medically advised that the use of envelopes with multicoloured borders was undesirable as they are a potential source of eyestrain

Hospital Beds for Tuberculosis Patients

Brigadier F MEDLICOTT asked the Minister of Health if, in view of the fact that 11,000 people suffering from tuberculosis were awaiting hospital beds, he would give favourable consideration to the suggestion that a minimum of 10% of the beds in general hospitals should be set aside for tuberculosis cases —Mr BEVAN replied Yes, I am doing so But there can clearly be no set rule about it

Cost Allowance on Drugs

Colonel L ROPNER asked the Minister of Health why, without effective consultation with their central committee or awaiting the findings of the Whitley Committee which was inquiring into this matter, he had imposed upon chemist contractors, under the National Health scheme, a cut from 33% to 16% in the on cost allowance on drugs supplied by them under prescription —Mr BEVAN replied I am determined that all unnecessary expenditure on the National Health Service should be eliminated, and after consultation with the chemists' representatives in accordance with the regulations I was satisfied that there were grounds for an immediate provisional reduction in this allowance Negotiations are proceeding however, and I have undertaken to accept whatever final percentage may be agreed by the Whitley Council or awarded by an arbitrator

Mileage for Rural Doctors

Dr A D D BROUGHTON asked the Minister of Health whether he would increase the mileage allowance for general medical practitioners in rural areas to compensate for the rise in the cost of petrol —Mr BEVAN replied I am always ready to discuss with the profession any ideas for the better distribution of the total moneys available for general practitioners But I could not regard the imposition of a new tax as justifying any addition to the total amount

Dr BROUGHTON Is the Minister aware that much of the help which he gave to the rural practitioner by increasing the mileage allowance a short time ago has now been counteracted by the rise in the cost of petrol ?—Mr BEVAN If every time a new tax was imposed reliefs were given to meet it there would be no revenue from new taxation

Mr A E BALDWIN Could not the Minister give more sympathetic consideration to this matter, which is causing hardship to doctors in scattered rural areas ? May not the result be greater difficulty in getting doctors for scattered areas ?—Mr BEVAN I have not yet observed that the members of the medical profession are deficient in organisations to put forward schemes on their behalf

'Agene' Process

Dr BARNETT STROSS asked the Minister of Food how soon all flour treated by some form of improver would be so treated that the agene process could be forbidden, and whether he would estimate the cost in dollars for machinery and chlorine dioxide, which must be imported from the United States of America —Mr MAURICE WEBB replied It will take about two years to complete this change, and it will probably cost about 337,000 United States dollars

Dr STROSS Is the Minister aware that there is a considerable body of medical opinion that believes that peptic ulceration is aggravated by the agene process and that this has been responsible for the increase of duodenal and gastric ulcers within recent years ? Will he give the House an assurance that as soon as possible we shall be free from this somewhat poisonous improver ?—Mr WEBB Two years is the period.

Public Health

Infectious Tuberculous in London

AT a meeting last Tuesday, the London County Council agreed that the Ministry of Health should be approached with a view to clarifying the responsibility, as between regional hospital boards and local health authorities, for the care of tuberculous patients who can receive no further benefit from sanatorium treatment but who have no homes or whose home conditions are unsuitable

The council's health committee estimates that in common lodging-houses in London there are some 1[illegible] chronically infective people with little or no working capacity. Before the start of the National Health Service the council accommodated the chronically infective in small voluntary sanatoria

"Since 5th July, 1948, however," the health committee reports, "difficulty has been experienced in finding accommodation for them, as owing to the pressure on hospital beds for acute cases the Metropolitan Regional Hospital Boards have been unable to provide accommodation and take the view that these cases are not their responsibility"

It was contemplated by the council that, under section 28 of the National Health Service Act, such sanatoria would ultimately be established in various parts of the county, where possible in conjunction with special workshops to be provided by the Disabled Persons Employment Corporation The council submitted a proposal for the demolition of St Peter's Hospital, Stepney (which was not transferred under the Act) and the erection of a night sanatorium and industrial workshops, but the Minister of Health, though approving the proposal in principle, rejected it because of the cost

As regards hostels, the committee is in doubt whether the responsibility lies properly with the council, as a local health authority, or with the regional boards.

"A hospital authority has responsibilities in many fields extending beyond treatment and it can be held that the provision of institutional accommodation *should not be* limited to persons for whom treatment is a primary consideration. Though medical skill may be unable to do much or anything for the ambulant chronic infective tuberculous person, he may at any time require urgent admission to hospital and if hostels of this type were controlled by the Regional Hospital Boards such urgent admissions could be arranged more easily than if two separate administrative bodies were concerned Moreover the staffing of hostels would be difficult and would present an easier task to an authority having a large institutional staff than to one controlling only a few institutions of like and, so far as staff is concerned, unattractive kind

"We are satisfied," the committee concludes, "that the urgent nature of the problem requires an early decision so that whatever the decision is urgent action can be taken"

Smallpox on a Vessel

A Goanese seaman was landed from s s *Strathnaver* at Aden on June 19, believed to be suffering from chickenpox The diagnosis was later confirmed as modified smallpox Passengers and crew were vaccinated during the voyage The vessel arrived in the Port of London on the morning of July 2 There was no case of sickness on board on arrival Some 1200 passengers and crew disembarked and were placed under surveillance in the areas to which they proceeded, until July 5 Practitioners are advised to consider a diagnosis of smallpox if a person who travelled on this vessel falls sick Revaccination may cause extreme *modification* of the clinical illness and of the exanthem

Poliomyelitis

The numbers of notifications of poliomyelitis in England and Wales during the week ended June 16 were paralytic cases 104 (77), non paralytic cases (16) Figures for the previous week are shown in parentheses Although this is a substantial increase, the high prevalence still seems to be chiefly confined to a relatively limited area of the Midlands There were 45 notifications in Warwickshire, of which 11 were in Birmingham 9 in Staffordshire and 14 in Worcestershire The epidemiological picture differs from that in the corresponding weeks of 1947 and 1949

In England Now

Running Commentary by Peripatetic Correspondents

HE other morning I woke early, full of joy, saying to self "ah, it's my birthday today" Then Henrik, elder son, came in and asked for sixpence for some-ng at school I asked him if he knew what day it s, he said it was Tuesday After a while my wife ke up and very kindly congratulated me, and I ought "now the celebrations begin" The front-door l rang, I got up in a hurry to take in all the parcels was the postman all right He left one letter—a cular from a drug firm My wife had now fallen eep again, Henrik had started to school with his pence, and Anne, though rising four, never seemed have heard of her father's birthday I was thinking odily about inconstant friends when I heard our maid ying about in the dining room I went in with a ile, thinking that this simple, but honest, soul would "Oh, sir, I have fried two eggs for you this rning" Her eyes were closed with œdema, and she s crying, not a word of congratulation I asked if e had dropped something and she said "No no no", d after many desperate attempts sobbed out that she s expecting a baby in September Despite this tastrophe I got my breakfast and went to the hospital here I met the matron and thought of the nice box of ocolates I had given her for her birthday She said e was glad to see me, but it was only because the day fore I had done a total colectomy for a patient with cerative colitis and he was very poorly and no-one new what to do When I got home to lunch, more serable than ever, I asked my wife if she didn't think queer that I hadn't had a word of congratulation from ryone. She asked if I'd written to James, or John, or arcus on their birthdays, and I suddenly realised I adn't the faintest idea when their birthdays were hat helped me a lot I got hold of the telephone, and called Nils and some others We had a very good party here everyone enjoyed themselves thoroughly and obody thought about my birthday My friends may, owever, care to know that this all happened on May 30

* * *

One of my colleagues recently went up on a Short ist You would have thought he was just the man for e job He had experience and all the right qualifica-ons He went up wearing an inoffensive *sub fusc* nting, a clean handkerchief, and a Hawks tie (borrowed or the occasion), and he had been properly coached the Ritual. He entered on all fours, caressed the left oot of each member of the board in correct order of recedence, and withdrew from the Presence backwards He gave (to my mind) perfectly adequate answers to he Three Riddles, and his manner throughout was onciliatory and polite And yet he was chucked out Why? Simply because he had forgotten to remove his at

Many people fall down over the Three Riddles The iddles vary slightly in different localities, but a working nowledge of ten or a dozen "spot" riddles (obtainable om any reputable coach) will cover most contingencies ou may wonder whether there are right (and therefore rong) answers to these riddles, or whether they are sked blindly just to see what they bring forth, like those ightful questions the Phosphorescent Unmentionables sed to fire off at you at WOSBEES There are, of course, o universally correct answers An answer which is pplauded in the Metropolitan Area (and how those oys can whistle and stamp!) may well evoke raspberries the North Take, for example, the classic "What ould you do if you were granted six months' study ave?" Any decent Londoner would unhesitatingly eply, "Go to the U.S.A. and have some memorable eals" In the Midlands this would merely invite the y come back, "What's wrong with Blackpool?" ocal feeling must be studied and allowed for In some calities, "Go and work in a lab and bring myself up o date with pathology," is not only swallowed but found alatable

The question, "What makes you think you are the ost suitable man for this appointment? is a stinker Don't touch it Pretend you didn't hear it or change the conversation, unless you are lucky enough to possess a broad Scots accent and can deliver yourself of some pawky whimsy, like "Och aye It's like Keith Prowse, ye ken Ye want the finest doctors We hahve them" This cannot be rendered satisfactorily in B B C, Oxford, or Cockney

Another really tricky one is, "What experience have you of filling up forms?" What can one say? "Twenty-five years"? or "So much that I can do them in my sleep"? A friend of mine, a very fine amateur actor, gave a masterly answer 'Well as a matter of fact," he confessed smiling at his finger-nails, "that happens to be rather a speciality of mine In the first place I never do them during working hours I always take them home and my wife helps me with them On Sundays we often take them out in the car and picnic in the woods with them" He clotted it because on his application form he had admitted to being single (although under both headings "Religion" and "political leanings" he had inserted "Mormonism") Above all things be consistent

Should the interrogation be unilateral? I think not and it was welcome news to me that one group of candidates, tired of waiting nearly an hour for the board to assemble, sent out for an extra kitchen chair, and called in those members of the board who were available one by one and subjected them to a stringent interview in the waiting-room One candidate, whose father was a successful author and dramatist who annually supplied the Exchequer with £15,000 was inclined to cavil at the board's expenses Another, whose openly avowed ideas of life included things other than 60 working hours a week, inquired about the sporting and cultural amenities of the neighbourhood, and would you believe it, the chairman himself had never heard of Sibelius and didn't even know if there were any good kindergarten schools nearby! All agreed that two of the board were disgracefully in need of a haircut, and further that they wouldn't touch the job with a barge pole (They all had a date later in the week at a short-list party in a populous South Coast resort all, that is, except a displaced person who had dozed throughout the proceedings, and got the job This situation can only arise when it is a buyer's market)

Statistics can be made to show that every minute of the working day nearly five short-listed doctors are travelling by train at public expense towards selection boards If you divide by sixty, and multiply by say forty miles an hour and a penny-three-farthings a mile, you get a fantastic figure Repeat the calculation as often as you like and you'll get similar answers I would suggest that great saving of both time and money could be effected if short-list conventions were abolished and superseded by a good honest-to-God lottery system one ticket per candidate and not transferable. All lotteries would be run from one central office by one part-time clerk with a part-time roulette board. Doubtless during the day-time the one from the M R C statistical department could be borrowed or hired

* * *

My hours spent in studying the seed merchants' catalogues in the winter were not wholly wasted, even though I never quite succeed in growing the exquisite blooms and full luscious fruit and vegetables of the illustrations For I jotted down in my diary a lot of names that are proving useful in discussing pathology with my "popular-science" patients As I hoped, schizanthus and eschscholtzia have been a great success in psychiatric interviews Streptocarpus sounded just the sort of new bacterium which would be the cause of Mr Smith's persistent catarrh, and nobody has ventured to question my diagnosis of that rash of young Brown's as *Fulgens multipetala*

Then this evening, as bedtime approached, I suddenly remembered that I have to attend the local medical society dinner tomorrow night. I recalled with horror the adverse comments last year when I was unexpectedly called on to say the Latin grace and mumbled far too audibly "Latissimus dorsi pectoralis subclavian, flexor accessorius et extensor carpi pollicis" But this year all should be well, for I shall say "Nigella raphanus sativus calendula crimflorum tigrinum splendens et glyssum amaranthus polyanthus lathymus latifolius"

Letters to the Editor

THE REGISTRAR'S FUTURE

SIR,—It seems to be generally agreed that an alteration in the ratio between registrars and consultants is essential, to give those in training a hope of fulfilling their ambition But *why* should this be achieved by reducing the number of registrar (and senior registrar) appointments only, without increasing the number of consultantships, as implied in the Scottish survey and your leading article? You say (June 24) "More consultants might be appointed, but the consultant establishments have only lately been fixed, and any substantial increase at this juncture of the nation's (and the service's) affairs is likely to be resisted" If consultant establishments have been fixed, the number of beds and amount of work for which one consultant is expected to be responsible have not been defined In the former local authority hospitals particularly, owing to the shortage of consultants on the establishment, much work normally regarded as the responsibility of a consultant has devolved on senior registrars and registrars

The "resistance" to appointing more consultants is presumably on economic grounds If this is so, the whole question of remuneration in the N H S which has produced such anomalies and dissatisfaction should be reviewed On the "appointed day," while general practitioners suffered, substantial increases were made in the salaries of consultants, registrars, and house officers Although this increase was welcome, it was evidently based on miscalculation, and registrars at any rate might have preferred to live at their former standard if this meant more prospect of promotion, and a permanent job The salaries of consultants under the N H S compare favourably with those of other professions and of others inside the medical profession, and I suggest that no hardship would result if the commencing salary of younger consultants at any rate was lowered

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There is evidence that *intravenous* adrenaline in effective doses *is* a very potent stimulator for the adrenal cortex [1] It is generally taught that in man intravenous adrenaline causes ventricular fibrillation and death If dilute solutions are given slowly however, the case is different In 1927 I had to treat some 350 cases of asiatic cholera, under emergency conditions, with a death rate of 50% I found that intravenous adrenaline—six drops of 1 1000 adrenaline hydrochloride in one pint of Ro[illegible] hypertonic saline—had a very improving effect on [illegible] in the dreaded "collapse" or "algid" phase of [illegible] disease I mention this experience to show that intravenous adrenaline, if used carefully, is not necessarily lethal, but might be beneficial in carefully selected cases Further evidence of the innocuousness of, and benefit from, intravenous adrenaline has been provided by Marcus and Gray [2]

It may be that the stimulation of the adrenals must be qualitative rather than quantitative, but this difference is not borne out by the findings of Greene [3] I think the effect of adrenaline by the intravenous route is more potent and peculiar than when this drug is given orally subcutaneously, or even intramuscularly

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though these factors may not be wholly absent Human frailties of this kind we shall always have, but what is now implied is worse than this, it is an error of thinking and method, a true quackery now to be introduced into medicine In the last resort, such a censorship of hospital research work as is now adumbrated must be the responsibility of a single individual who will have to decide which research project is to be encouraged and which banned However catholic his knowledge of the vast and variegated field of medical research, no one man can exercise this function rationally or equitably, and he must in undertaking it, become an administrative medical quack

Moreover, the whole notion betrays an abysmal ignorance of the nature of clinical research The spirit bloweth where it listeth, and no one can foretell of any research project, within wide limits, what possibilities of fruit it holds Equally it cannot be foreseen what light a single piece of research may throw upon another and an independent one which covers the same field We should not say to Goethe "there is no need for you to write a drama about Faust, for a very excellent one has already been written by Marlowe, and we really can't allow you to spend your time and our money this way, for after all, you are a State salaried official" Yet, *mutatis mutandis*, something as absurd and as intolerable as this is what is now proposed

That a single central authority or person should be imposed upon us to decide which infant idea is to be strangled at birth and which conceded nourishment is a development which will take no wise spectator of what is happening to medicine by surprise, but even the most guileless of us must view it with grave disquiet

London W 1 F M R WALSHE

GENERAL ANÆSTHESIA FOR BRONCHOGRAPHY IN CHILDREN

SIR,—I have read with interest, in your issue of June 10, the technique employed by Dr Way and Mr James for anæsthetising children for bronchography, but I agree with Dr Wright (June 24) that the dosages of thiopentone mentioned may be dangerously large I have known 0 5 g of 5% thiopentone solution given to a boy, aged 5 and of average weight, prior to intubation for bronchography, prove to be a gross overdose

A technique which I have found satisfactory in a small series of cases is as follows

Age (years)	*Approx normal weight (st)*	*Premedication (1 hr before op) 'Omnopon' (gr) + hyoscine (gr)*
2–4	2–2½	$^1/_{12} + ^1/_{600}$
4–10	2½–4½	$^1/_9 + ^1/_{450}$
10–12	4½–5½	$^1/_6 + ^1/_{300}$

Anæsthesia is induced with a mixture of 5% thiopentone and *d*-tubocurarine chloride If age and body weight tally, 1 ml of thiopentone is given per year of age and 2 mg of tubocurarine per st body weight The injection is given through a no 19 'Vim' needle, and after insufflation with oxygen a special endotracheal tube with side tube (which I rightly or wrongly have called a Jones's tube) lubricated with 1% 'Anethaine' cream, is introduced into the trachea

A Macintosh laryngoscope is used, and intubation is facilitated by the use of a stilette passing through a Cobbs union with the cap removed and three quarters of the length of the endotracheal tube The pharynx is then packed off with gauze soaked in normal saline Anæsthesia is maintained with nitrous oxide and oxygen (30%) given through a closed circuit Respiration is assisted, and if the tidal exchange is inadequate at the end of the bronchography a small dose of neostigmine and atropine is administered

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W N ROLLASON

Hull

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The committee appreciated that the cause of peace in the world is as much in need of support as ever it was in the past, but it expressed the view that its members could best serve that cause by associating themselves with one or other of the active organisations working for the purpose

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SELF-HELP OF UNDEREMPLOYED DOCTORS

SIR,—It is proposed to form a team—or several teams—of doctors, men and women who, like myself, are now without appropriate work or income This team is going to offer its services to the National Health Service and will settle wherever it is most needed. This may be in an underdoctored area or in support of overworked outpatient departments Its members are going to pool their resources of brains and skill, equipment, and money They will acquire two houses and adapt the one for use as a central surgery with all facilities for diagnosis and outpatient treatment, the other as living quarters for themselves and their families Work, service, and expenses will be shared by members and their wives (or husbands) So will the income. Each member will be required to practise as a general practitioner besides having a chance of using special experience All must be prepared to share fully the risks and hardships of the first years All will be stimulated by the knowledge that they are fighting common adversity by a combined effort, and that the success of their venture will lead to a decent livelihood earned by work of a high standard

though these factors may not be wholly absent Human frailties of this kind we shall always have, but what is now implied is worse than this, it is an error of thinking and method, a true quackery now to be introduced into medicine In the last resort, such a censorship of hospital research work as is now adumbrated must be the responsibility of a single individual who will have to decide which research project is to be encouraged and which banned However catholic his knowledge of the vast and variegated field of medical research, no one man can exercise this function rationally or equitably, and he must in undertaking it, become an administrative medical quack

Moreover, the whole notion betrays an abysmal ignorance of the nature of clinical research The spirit bloweth where it listeth, and no one can foretell of any research project, within wide limits, what possibilities of fruit it holds Equally it cannot be foreseen what light a single piece of research may throw upon another and an independent one which covers the same field We should not say to Goethe "there is no need for you to write a drama about Faust, for a very excellent one has already been written by Marlowe, and we really can't allow you to spend your time and our money this way, for after all, you are a State salaried official" Yet, *mutatis mutandis*, something as absurd and as intolerable as this is what is now proposed

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n the first instance I would ask those interested
pstrars, S.H.M.O.s, and other "D.P.s") to write to
giving details of their personal circumstances,
lities, and hopes Degrees and capital are of less
portance than character and the pioneer spirit. A
eting of those preselected—and their wives and
bands—will be convened at a place and date to be
eed on

, Welbeck Street London W 1. L S MICHAELIS

THAMES POLLUTION

SIR,—The bacterial quality of the waters in the upper
ches of the Thames is arousing acute controversy.
Recently, several riparian local authorities expressed
ir apprehension at the high degree of bacterial
purity in samplings from their reaches, especially in
w of the potential menace to the health of bathers.
l notified the Thames Conservators of their anxiety
e Conservators, in their reply,[1] declared the Thames
be no less safe now than in past years and said that
re is no proof of any ill effects on anyone bathing in
river The Minister of Health apparently agrees
h the views expressed by the Conservators[2] Never-
less it cannot be held that doubts have been resolved,
d it is difficult on rational grounds to justify the
nservators' contentions Indeed, they appear to
confounded by a statement by the Metropolitan
ater Board, in their forthcoming petition to Parlia-
ent that the standard of purity of the raw waters of
e Thames has deteriorated in recent years

It is stated authoritatively that the ordinary methods
sewage purification effect no significant removal or
struction of bacteria, and that effluents, even when
high standard by chemical analysis (on which the
nservators rely solely) are to be regarded, bacterio-
gically, as little less dangerous than sewage[3] Hence,
less sewage is treated by some form of disinfection,
e pollution of a river will be proportional to the popula-
n of the areas which drain into it. Both during and
ce the war the populations in the townships round
e upper reaches of the Thames have appreciably
creased, and it is officially admitted that at more than
e point the effluents being discharged into the river
e highly objectionable.

A rise in population means, too, that while more
amage goes into the river, more water is taken out To
eet the expanding consumer needs, both domestic and
dustrial, the local water undertaking has abstracted
stly larger amounts and a further demand is under
tive consideration Even this abstraction, however, is
actional compared with the many more millions of
llons daily removed from the upper reaches of the
hames and supplied to London by the Metropolitan
ater Board and in this connection it is of interest
at the newly opened unit at Walton works is to provide
additional 6 million gallons per day to the London
ea.

The effect of these various factors must be to increase
e bacterial density of the raw waters, and it is unlikely
at bacterial self-purification plays a significant part
here no great distances separate the points of sewage
tfall. One may speculate as to the effect of the increas-
g contamination in times of drought, and as to whether,
timately, in face of certain new requirements, the
quilibrium will overbalance to the detriment of the
ushed waters provided by the water undertakings.

If it is true that, as the Conservators say, there is no
roof of ill effects from bathing in the Thames, it is equally
ue that there is no disproof. Even in authenticated
aterborne epidemics it is extremely difficult to "prove"
the actual source of pollution, for the bacterium is rarely isolated, and the inculpation of a particular water usually rests on circumstantial evidence, from which the best-favoured probability is selected. The Croydon epidemic of 1937 provides a classical example A priori, I should regard it as likely that cases of illness have in fact been derived from bathing in the Thames Since we know that raw river waters are bacteriologically unsafe—especially in certain localities—and that those who bathe and swim in these waters may ingest appreciable quantities, we shall not be far wrong in supposing that some of the illnesses attributed to waterborne infections have been contracted from the rivers Naturally the existence of many alternative sources of infection, and the fact that the bathing public are only a minute cross-section of communities which are often widely dispersed, make it difficult to disprove that river water is often responsible, especially as most cases of illness thus derived would be treated empirically, and would not be notified or investigated.

It is not my intention either to overemphasise these dangers or to reject them The Thames, however, is of growing importance as a source of water-supply, and to prevent its further deterioration the need for new anti-pollution measures, including sterilisation in some form[3] should now be urgently considered

Walton-on Thames MICHAEL ALBURY

THE THREE TYPES OF "NATURAL" DIURESIS

SIR,—Professor Borst and Dr de Vries, in their article last week, state that "the posterior-pituitary reaction affects the output of water and electrolytes in opposite directions," quoting Eggleton and Smith[4] and Sartorius and Roberts[5] We feel that this statement may be misleading

Eggleton[6] observed a depression of chloride output in the urine accompanying a water diuresis, which continued as the rate of urine-flow fell. Eggleton and Smith[4] suggested that the two factors, antidiuretic and chloride reabsorbing while closely linked and probably both of pituitary origin were not identical. The experiments of Sartorius and Roberts were performed on dogs.

We have recently shown[7] that posterior-pituitary extracts do not increase the output of sodium and chloride in man. Whatever factor is responsible for the depression of chloride output during water diuresis, we do not believe that it is a posterior-pituitary one.

Department of Medicine
The Middlesex Hospital,
London W.1

T. M CHALMERS
A. A. G LEWIS
G L S PAWAN.

CHLORAMPHENICOL IN MUMPS

SIR,—In my limited experience, chloramphenicol has been so uniformly effective in the treatment of mumps that I am prompted to publish the results in the hope that others may give it a more extensive trial.

CASE 1.—A young man, aged 18, complained one evening of feverishness and malaise Next morning one parotid gland, and that evening the other, became swollen. Temperature 38–38 5°C

Chloramphenicol was started on the following day, with an initial dose of 2·5 g followed by 500 mg 5-hourly. Pain and temperature disappeared after 36 hours Treatment was continued until 24 g had been given.

CASE 2.—A young man, aged 20, seen on the 5th day of the disease, had very painful bilateral parotid swelling trismus and a temperature of 40°C The same dosage of chloramphenicol was given. Pain and fever disappeared after 24 hours, and the swelling was gone in another 24 hours.

1. *Times* April 18 1950 p 2
2. *Hansard*, May 11 1950 col 583
3. Thresh, Beale, and Suckling's Examination of Waters and Water Supplies. Edited by E. W Taylor London 1949.
4. Eggleton, M. G., Smith, L G *J. Physiol.* 1946 104 435
5. Sartorius E. W., Roberts K. *Endocrinology*, 1949 45 273.
6. Eggleton, M. G *J Physiol.* 1943 102 116
7. Communication to the Physiological Society, Jan. 6 1950 *Ibid* (in the press)

though these factors may not be wholly absent Human frailties of this kind we shall always have, but what is now implied is worse than this, it is an error of thinking and method, a true quackery now to be introduced into medicine In the last resort, such a censorship of hospital research work as is now adumbrated must be the responsibility of a single individual who will have to decide which research project is to be encouraged and which banned However catholic his knowledge of the vast and variegated field of medical research, no one man can exercise this function rationally or equitably, and he must in undertaking it, become an administrative medical quack

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CASE 3—A boy of 10 came back from school vomiting repeatedly and complaining of headache Temperature 38 5°C Next morning his temperature was 40°C, and he had a slight tender swelling in the left parotid gland and difficulty in swallowing Chloramphenicol 1 25 g was given in 1 hour, followed by 250 mg 5 hourly Next morning the temperature was 38° C, the tenderness on the left side was practically gone but the right submaxillary gland was swollen Next day this swelling had subsided and the temperature was normal

CASE 4—Exactly two weeks after the boy of case 3, his mother was taken ill with malaise and dizziness but no pyrexia In the course of the day her left parotid gland began to swell, and in the evening she could not open her mouth Next morning the swelling became more apparent and was very tender The temperature remained normal, and she volunteered that when she was ill her temperature seldom rose above normal Chloramphenicol was given in the evening—2 5 g in the course of 2 hours, and 0 5 g 5 hourly thereafter Owing to dizziness and loss of accommodation, the dosage was reduced after 15 hours to 0 5 g 8 hourly In all, 7 g was given, after which the drug had to be withheld The temperature never rose above 37 2°C On the 3rd day, the right submandibular gland was affected The pain disappeared on the 5th day, swelling subsided on the 8th day

This case appeared to be mild from the start, and it is difficult to evaluate the effect of chloramphenicol on it

Cairo P GHALIOUNGUI

WATER AS A NUTRIENT

SIR,—In his letter of June 10, Mr Bullock writes "Moreover, in cooking, much of this calcium might go out of solution, forming a deposit on cooking utensils and becoming unavailable"

Various workers have found that calcium is actually deposited on vegetables during cooking, thereby making more calcium available for consumption [1-3] The following figures are reported by Donald [1]

	Calcium (mg per 100 g) Raw	Boiled
Beetroot	21	27
Cauliflower	19	23
Potato	9	16

Good Housekeeping Institute
28–30, Grosvenor Gardens'
London S W I

G H DONALD

EMPLOYMENT FOR THE TUBERCULOUS

SIR,—It is generally accepted among tuberculosis workers that the risk of contracting tuberculosis is less in a modern sanatorium than in many general hospitals and factories On the other hand, the Joint Panel on the Resettlement of the Tuberculous, a body representing the National Advisory Council on the Employment of the Disabled and the Tuberculosis Standing Advisory Committee of the Central Health Services Council, have recommended that infectious tuberculous persons seeking ordinary employment should be submitted to jobs by the Ministry of Labour only if they agreed to the disclosure of their disability to the prospective employer

At the present time there is no unified policy regarding the management of the persistently sputum positive case of pulmonary tuberculosis The National Health Service Act has concentrated our attention on the treatable case—the one in which there is a good possibility of sputum conversion being obtained In spite of this, large numbers of patients are discharged from sanatoria each year with a positive sputum A further number with a positive sputum are never admitted to sanatorium since they would not benefit from active treatment In consequence, around 25% of the cases of pulmonary tuberculosis known to the chest clinics and who are not in hospital have a positive sputum It can be seen, therefore, that the group of infectious cases of tuberculosis is not a small one

What are we to do with them? The recommendation that the disablement resettlement officers of the Ministry of Labour should inform the prospective employer of the patient's disability means that very few of this group will obtain suitable employment Instead, many will obtain employment by their own efforts—employment which may not be suitable for their condition and where the working conditions may be conducive to the spread of infection

If it is felt that the infectious case of tuberculosis is a menace, then segregation is the answer and we should press for this policy to be implemented As much, if not more, damage can be done by these people frequenting cinemas and other places of entertainment as could be done at work

On the other hand, if it is accepted that nursing known infectious cases of tuberculosis is safer than working in general hospitals, then we cannot regard this group of patients as a menace Surely then, it would be better to allow infectious cases of tuberculosis to be submitted for ordinary employment by the Ministry of Labour, provided that the chest physician is satisfied that the patient has been taught and observes the usual hygienic precautions taught in hospital

As a result of consultation between the disablement resettlement officer and chest physician, the patient would be more likely to obtain a situation which is not deleterious to his condition, and this would allow consideration to be given to the conditions under which the patient would be working—for example, whether the factory employs many young people from rural areas, and whether resistance to infection is likely to be lowered by such factors as fatigue from long travelling and unsatisfactory meals

Harrow R GRENVILLE MATHERS
Consultant Chest Physician.

Edgware H J TRENCHARD
Consultant Chest Physician.

CEREBELLAR SYNDROME FOLLOWING SODIUM AMYTAL

SIR,—In the following three cases, seen lately within ten days of each other, 'Sodium amytal' gave rise to cerebellar dysfunction

CASE 1—The first case was a spinster, aged 48 who some months previously had received electroconvulsive therapy for endogenous depression She had lost her suicidal tendencies but still had symptoms very similar to those of the post concussional syndrome Apart from headache, the most disabling symptom was extreme hyperacusis, and since the patient lives in a bungalow in a densely populated area with a high birth rate, her state was particularly unhappy To make her lot more tolerable, I prescribed sodium amytal gr 3 at night, and gr 1 if necessary during the afternoon when the children of the neighbourhood erupted from school with screams of delight

After she had been taking this dosage for about a fortnight, she came for a follow up consultation She collapsed on the threshold There was no loss of consciousness, no pallor, no slowing of the pulse I placed her in an armchair and made a mental note of "hysteria." I thought that this sudden 'paraplegia" was an unconscious protest at my requiring her to come across the city, it seemed unwise to examine the central nervous system lest the symptoms became fixed, so I contented myself with discussing her current domestic difficulties and I advised her to continue sodium amytal in the same dosage

CASE 2—Three days later I visited a man, aged 60, who had lately had a sudden severe attack of precordial pain, which had been tentatively diagnosed by his doctor as of cardiac origin Actually, the source of this pain was proved to be fibrositic For many years this man had had nosophobia, his particular dread being tabes The suggestion that he might have angina had dire results, he developed an acute anxiety state with raised blood pressure

I put him on sodium amytal gr 3 four times a day For a week this had excellent results he was sleeping well, his

1 Donald G H J Canad Diet Ass December 1940
2 Ziegelmayer W Z Ernahr 1931 1 25
3 Horner A J Soc chem Ind Lond 1939 58 86

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SIR,—In his letter of June 10, Mr Bullock writes "Moreover, in cooking, much of this calcium might go out of solution, forming a deposit on cooking utensils and becoming unavailable"

Various workers have found that calcium is actually deposited on vegetables during cooking, thereby making more calcium available for consumption [1-3] The following figures are reported by Donald [1]

	Calcium (mg per 100 g) Raw	Boiled
Beetroot	21	27
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Good Housekeeping Institute
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G H DONALD

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At the present time there is no unified policy regarding the management of the persistently sputum positive case of pulmonary tuberculosis The National Health Service Act has concentrated our attention on the treatable case—the one in which there is a good possibility of sputum conversion being obtained In spite of this, large numbers of patients are discharged from sanatoria each year with a positive sputum A further number with a positive sputum are never admitted to sanatorium since they would not benefit from active treatment In consequence, around 25% of the cases of pulmonary tuberculosis known to the chest clinics and who are not in hospital have a positive sputum It can be seen, therefore, that the group of infectious cases of tuberculosis is not a small one

What are we to do with them? The recommendation that the disablement resettlement officers of the Ministry of Labour should inform the prospective employer of the patient's disability means that very few of this group will obtain suitable employment Instead, many will obtain employment by their own efforts—employment which may not be suitable for their condition and where the working conditions may be conducive to the spread of infection

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On the other hand, if it is accepted that nursing known infectious cases of tuberculosis is safer than working in general hospitals, then we cannot regard this group of patients as a menace Surely then, it would be better to allow infectious cases of tuberculosis to be submitted for ordinary employment by the Ministry of Labour, provided that the chest physician is satisfied that the patient has been taught and observes the usual hygienic precautions taught in hospital

As a result of consultation between the disablement resettlement officer and chest physician, the patient would be more likely to obtain a situation which is not deleterious to his condition, and this would allow consideration to be given to the conditions under which the patient would be working—for example, whether the factory employs many young people from rural areas and whether resistance to infection is likely to be lowered by such factors as fatigue from long travelling and unsatisfactory meals

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CEREBELLAR SYNDROME FOLLOWING SODIUM AMYTAL

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CASE 1—The first case was a spinster, aged 48 who some months previously had received electroconvulsive therapy for endogenous depression. She had lost her suicidal tendencies but still had symptoms very similar to those of the post concussional syndrome Apart from headache, the most disabling symptom was extreme hyperacusis, and since the patient lives in a bungalow in a densely populated area with a high birth rate, her state was particularly unhappy To make her lot more tolerable, I prescribed sodium amytal gr 3 at night, and gr 1 if necessary during the afternoon when the children of the neighbourhood erupted from school with screams of delight

After she had been taking this dosage for about a fortnight she came for a follow up consultation She collapsed on the threshold There was no loss of consciousness, no pallor, no slowing of the pulse I placed her in an armchair and made a mental note of "hysteria" I thought that this sudden "paraplegia" was an unconscious protest at my requiring her to come across the city it seemed unwise to examine the central nervous system lest the symptoms became fixed, so I contented myself with discussing her current domestic difficulties and I advised her to continue sodium amytal in the same dosage

CASE 2—Three days later I visited a man, aged 60, who had lately had a sudden, severe attack of precordial pain which had been tentatively diagnosed by his doctor as of cardiac origin Actually, the source of this pain was proved to be fibrositic For many years this man had had nosophobia, his particular dread being tabes The suggestion that he might have angina had dire results, he developed an acute anxiety state with raised blood pressure

I put him on sodium amytal gr 3 four times a day For a week this had excellent results he was sleeping well, his

1 Donald G H J Canad Diet Ass December 1940
2 Ziegelmayer W Z Ernähr 1931 1 25
3 Horner A J Soc chem Ind Lond 1939 58 86

ood pressure dropped by 50 mm Hg, and he was no longer preoccupied with his heart But to my annoyance he spoilt his satisfactory picture of recovery by complaining of a new symptom—sudden collapse while walking Twice while shopping in the town he suddenly felt giddy and had to sit down His legs gave way beneath him, objects tended to rotate, and he had a rather severe occipital headache, but no nausea or tinnitus Examination showed no nystagmus, with his phobia about tabes he has always had some romberg sign, and to elicit the knee jerks some reinforcement has been needed

Once again I attributed the "attacks" to psychogenic causes I argued that this man, with his fear of angina was collapsing out of doors as a defence against exercise that might strain a heart he believed to be vulnerable reiterated my assurances about the state of his myocardium, and reduced the dose of sodium amytal to gr 2 a day

CASE 3—The next day I visited a woman, aged 50, the headmistress of a school She is of manic-depressive temperament, and some years ago was operated on for exophthalmic goitre She was sleeping badly, feeling "end-of-vermish," and bothered by a possessive attachment formed by a member of her staff I prescribed sodium amytal gr 3 at night Some weeks later she reported that she felt extremely weak in the legs that it took her ten minutes to walk 200 yards to the post-box, and that she feared to cross *the road and would not go out alone lest she collapsed*

Electromyographic studies have shown that sodium amytal lowers tonus[1] In cats the lethal dose varies widely, and some which partly recovered had a persistent syndrome of altered reflexes and abnormal posture and gait, pathological changes were confined to the Purkinje cell layer in the cerebellum[2]

With these findings in mind, I reviewed the 3 cases

Re-examination of the 1st patient showed that she had very flabby calf muscles, and the ankle jerk on the left side could not be elicited There was no nystagmus and no incoördination in the upper limbs Sodium amytal was replaced by a bromide and soluble barbitone mixture A week later she was free of vertigo and had not collapsed again

The 2nd patient was also found to have very poor muscle tone in the calves both ankle jerks were, however, present There was no nystagmus and no incoördination in the upper limbs Sodium amytal was gradually replaced by phenobarbitone and the patient has not collapsed again

The 3rd patient had no evidence of altered tendon reflexes and no incoördination or ataxia, but muscle tone was poor Sodium amytal was stopped and phenobarbitone prescribed In less than three days she was walking alone with confidence, and had lost the vertigo

The idiosyncrasy in these cases may have been associated with hepatic dysfunction, which is said to increase toxicity[3] Sodium amytal belongs to the group of barbiturates which are chiefly broken down in the liver (though not to the same extent as thiopentone and hexobarbitone) only 3–5% is excreted in the urine, compared with 25% of phenobarbitone and 30% of allobarbitone

Of the 3 cases described here, the 1st had no history or evidence of hepatic disorder the 2nd was known to have gall stones and had had several attacks of biliary colic, and the 3rd may be presumed to have had hepatic dysfunction since hyperthyroidism is usually associated with defective liver function[4]

This series illustrates some of the difficulties of assessing the origin of symptoms in patients with psychiatric or psychosomatic disorders It is easy to accept as functional, symptoms which actually have an organic cause, and but for the coincidence of 3 cases arising within a fortnight, this syndrome of cerebellar dysfunction following administration of amytal might easily have been overlooked.

Bristol. FRANK BODMAN

1 Jacob on E *Ann intern Med* 1944 21 455
2 Skrop K., Gold H *J Pharmacol* 1945 88 260
3 Cushny's Pharmacology and Therapeutics Edited by A Grollman D Slaughter London 1947 p 316
4 Langdon Brown W Simpson, S L Medical Annual Bristol 1944 p 319

TRAVELLING EXHIBITIONS ON CLEANLINESS

SIR—May I assure Dr Forster, who wrote last week, that the Central Council for Health Education is dealing with the problem of its present stands being rather cumbersome

By September, 250 light frames, on which exhibition pieces can be displayed, will be available to local health authorities, making treble the number of stands in circulation These stands have been designed so that they can, if necessary, be carried in a private car, and assembled and dismantled in a few minutes Reports from medical officers of health indicate that where stands have been shown in factories, they have proved very popular, and the Council hopes that more approaches to this type of audience will be arranged

Central Council for Health Education Tavistock House, London W C 1 ROBERT SUTHERLAND Medical Adviser and Secretary

INJURY FROM ELECTRIC WASHING-MACHINES

SIR,—In the U S A housewives and children are not uncommonly injured by automatic washing machines In this city a woman had her arm pummelled for half an hour before she freed it by the slow process of dragging the machine to the switch, which she turned off

The injury may be severe, and may be followed by extensive loss of skin through damage to the cutaneous blood supply Injury to the muscles of the arm and forearm may seriously limit the activity of the fingers and hands The condition calls for prompt treatment in hospital. Immediate application of an efficient pressure bandage prevents collection of subcutaneous exudate Fine judgment is needed in the use of the pressure bandage and of rest, the time for starting active treatment must be chosen with care because œdema may recur Though at first the damage may appear very slight, ultimately destruction may be great

In the late stages the victim presents with an enormous subcutaneous hæmatoma, extending over the whole length of the forearm There may be areas of skin necrosis and associated infection, and severe œdema and puffiness develops in the hand, probably owing to obstruction of the lymphatic channels draining this region There is an area of relatively normal appearance around the wrist where the skin seems to be least affected, and the whole appearance is somewhat akin to that of an inverted champagne bottle

Fortunately, in the British Isles domestic washing machines with electrically operated rollers are rare, so the condition is unlikely to be seen, but a safety device should be installed on any machines that have automatic rollers

Boston Mass J D WADE

ANOXIA IN THE FŒTUS AND NEWBORN

SIR,—In your leading article last week you perpetuate an argument concerning periodic breathing which does not seem to have any justification You say

> "The alternating hyperpnœa and apnœa commonly seen in premature infants is a characteristic of 'mountain sickness' and gives place to regular respirations in an oxygen enriched atmosphere Premature infants with periodic respiration should therefore be given oxygen"

This suggests that the periodic breathing of the premature infant has the same physiological basis as the anoxic periodic breathing of mountain sickness, and neglects facts of fundamental importance These are (1) that periodic breathing is almost as common in the full term as in the premature infant, (2) that while this periodic breathing is occurring in the newborn, generally there is no cyanosis, which sharply distinguishes

CASE 3—A boy of 10 came back from school vomiting repeatedly and complaining of headache Temperature 38 5°C Next morning his temperature was 40°C, and he had a slight tender swelling in the left parotid gland and difficulty in swallowing Chloramphenicol 1 25 g was given in 1 hour, followed by 250 mg 5 hourly Next morning the temperature was 38° C the tenderness on the left side was practically gone but the right submaxillary gland was swollen Next day this swelling had subsided and the temperature was normal

CASE 4—Exactly two weeks after the boy of case 3, his mother was taken ill with malaise and dizziness but no pyrexia In the course of the day her left parotid gland began to swell, and in the evening she could not open her mouth Next morning the swelling became more apparent and was very tender The temperature remained normal, and she volunteered that when she was ill her temperature seldom rose above normal Chloramphenicol was given in the evening—2 5 g in the course of 2 hours, and 0 5 g 5 hourly thereafter Owing to dizziness and loss of accommodation, the dosage was reduced after 15 hours to 0 5 g 8 hourly In all, 7 g was given, after which the drug had to be withheld The temperature never rose above 37 2°C On the 3rd day, the right submandibular gland was affected The pain disappeared on the 5th day, swelling subsided on the 8th day

This case appeared to be mild from the start, and it is *difficult to evaluate the effect of chloramphenicol on it*

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2 Ziegelmayer W *Z Ernähr* 1931 1 25
3 Horner A *J Soc chem Ind Lond* 1939 58 86

Notes and News

HARVEIAN SOCIETY OF LONDON

HELD at Grocers' Hall on June 29, the Buckston Browne and Gray Hill dinner of this society was attended by 165 members and guests

The MARQUESS OF LINLITHGOW proposing The Society recalled William Harvey's association with Bacon, and Bacon's injunction, in his *Regimen of Health*

"forget not to call as well the best acquainted with your bodie, as the best reputed of for his faculty

The position of the family doctor was now in jeopardy, and he doubted whether the public had yet realised how much was at stake Prevention of disease—said to be our aim—required early recognition of departures from normal Bacon had rightly valued the general practitioner as the man "best acquainted with *my* body" Don't leave the general practitioner in isolation," said Lord Linlithgow, let him keep abreast of progressive medicine, enable him to use the daily increasing armoury of remedies, give him time to think as well as to work, and make this branch one that will attract the best men of their year As a patient he added, he was anxious that doctors should be properly remunerated, and that no practitioner to earn his bread and butter, should be driven to look after more patients than he could care for properly But he felt that everyone in the health service should bear constantly in mind that patients are the people most concerned in this affair the welfare of the patient should be the lodestone to which all should continually respond"

Dr R R TRAIL, responding as president said that the profession could hardly hear too often about its responsibilities perhaps doctors were not always aware how much faith was placed in them. He went on to compare Harvey's day with the present. When Harvey was alive, man was still the paragon of animals and the marvel of the world—not an atom in universal space There were brawls in the streets, and cruelty was everywhere public executions were the favourite spectacle and 200 witches were burnt in a year near Papworth Heresy and treason were synonymous, books were few and heavy, people did without glass bottles or windows or comfortable chairs But had we really advanced so far since then Had happiness increased? Was bubonic plague worse than the modern disease called frustration which was so grave a threat to the democratic way of life? Today there was mass production, but people were not prepared to sink their individualities Tons of aspirin would not make up for loss of faith and he expected a continuing increase of psychosomatic disorders—from eczema to pulmonary tuberculosis The answer lay with the medical profession, and it would be found when the problem was attacked with the same pertinacity as bubonic plague

Responses for The Guests (skilfully marshalled by Dr M. C W LONG) came from Lieut General Sir FREDERICK BROWNING and Dr RUSSELL BRAIN P.R.C.P, who said that the dinner was being held 300 yards from where Harvey lived, overlooking St Lawrence Poultry, 300 years ago What was now, Dr Brain asked, the state of the circulatory system of medicine? In the consultants we had some of the large vessels, and in the peripheral circulation we had the general practitioners Most of the important things in the body happened in the periphery, and we should learn from Harvey that what affected one part of the circulation affected the whole We must make of general practice a calling in which we should wish our sons to take part

THE SCOTS HAE A WORD FOR IT

IN one of the poems in his collection of *Gangrel Verses*[1] Dr William Barr describes his delight in having two kinds of speech As he puts it it's fine 'tae hae yer pockets on vae side, Yer pooches on the ither He has applied this system of balanced contrasts throughout his life Not only has he kept Lowland Scots at the tip of his English speaking tongue, but he has crossed the Border to live in England without losing any of his native flavour As a medical officer of health he has no doubt read a wealth of official rules and regulations but he has not lost his knack of describing simple occasions with sincerity and humour His little book will please not only his fellow Scots but also all those who consider "peely wally" an apt description of post-influenzal depression.

1 Glasgow William MacLellan. 1950 Pp 72 7s 6d

THE NATIONAL CHURCH

Trollope, in *Phineas Redux*, makes men speak of disestablishment of the Church as a thing bound to come in spite of the clergy politicians were concerned mainly to ensure that the measure should be passed by the appropriate party Whether or not this mirrored any general opinion of Trollope's day, it reveals a great difference from modern feeling

Then, as now, bishops of the Church of England were nominated by the Prime Minister, convocations could not meet or make canons without the licence of the Crown, and on an appeal from the ecclesiastical courts the doctrine of the Church was interpreted by State judges appointed by the State But in those days people and Parliament were nearly all Anglicans and it could be said that they, and the judges they appointed, represented the laity of the Church This no longer holds true, as the Archbishop of York puts it in a scholarly and temperate book,[1] a large number of members of Parliament "dislike institutional religion and certainly would not commit themselves to the definite acceptance of the Christian faith"

In short Parliament no longer represents the Anglican laity, yet it still retains traditional powers over the life of the Church How cavalierly this may be exercised was shown, in 1927 and 1928, by the rejection, in a few hours, of the revision of the Prayer Book, on which informed and able churchmen had worked for many years One argument used then was that to modernise the Prayer Book was to tamper with the nation's traditions (though anyone who reads the two versions can see how jealously tradition was guarded), and it is possible—even probable—that a move for disestablishment would rouse similar indignation in many who take no interest in the Church's activities The case for disestablishment comes nowadays from inside the Church, and the arguments for and against it are discussed in great detail in this book.

Those who have little knowledge of modern Church history will be startled to find how greatly the whole organisation of the Anglican community is hampered and frustrated by the present laws, and those who think the Church inept in using its great opportunities will find the cause of much that offends them in restrictions, regulations, and customs which make ordinary bureaucracy look like Liberty Hall

The Archbishop does not favour disestablishment except in the last resort but he puts a strong case for reforms which would liberate the Church to fulfil its proper duties to society and to direct its own spiritual life—notably that the dioceses should have a recognised right to be consulted in the choice of a new bishop, though the Prime Minister would still nominate and the Crown appoint, that the Church provided it had gained the agreement of most churchmen and lay members, should be able to revise its forms of worship without a debate in Parliament that canon law should be revised by the Church itself and that Church courts should be reformed, especially that the final court of appeal, which—though it has to settle questions of doctrine—is composed entirely of judges, should be replaced by a new court on which bishops are represented If it fails to gain these reforms, he believes the Church should ask for disestablishment

University of St Andrews

The following have been successful in recent examinations

M.D—C R Baxter J M. Gilmore K G Lowe (with honours and Rutherford gold medal) E J Michie Marjorie S Millin D S Macphail, J H Prain (with commendation and Rutherford silver medal) D H Smith (with commendation)

Ch.M—A. A. Douglas (with honours)

M.B Ch.B—*Mary R. Kerr †J N Gale †Ruth Y Golder †Marjory M. Kinnear, †Marion C Miller David Allan G C Arie John Bartholomew Frederick Bell Veronica M. Bowman Edith M. B Bryant Marjorie R Carnan, J D Carr, Helen M. Crockatt A. A. Duncan E E Ecoma Antonia Firnberg Harry Fyfe Jean O Gerrard D B Gibb Anne L M. Graham A. B Grant, P H Harley R G Hendry, B O Igwebe Elinor K. Johnston Martin Kirstein Elizabeth F Laird A J Lawson Irene Leeser R L MacDonald, J D Macgregor A R Mackenzie J M. McKenzie Muriel J Martin L M Mennie Margaret G Millar H B Milne I G Murray P W O Brien, W L Ogilvy D B L Rankine H C Renney Marie Renwick Madeline M. Russell, J H F Silver Tomas Sonnenschein D C C Stark, J K Steel, S A Stephen B R D Suttie Pauline F Taylor M. G Wagg Jane M. Wallace

* Distinction. † Commendation

1 *Church and State in England* By CYRIL GARBETT Archbishop of York. London Hodder & Stoughton 1950 Pp 320 15s.

Society for the Study of Addiction

At a meeting of the society to be held at 11, Chandos Street, London W 1, on Tuesday, July 18, at 4 P M, Mr L D Macleod, B SC, will speak on Biochemistry and Alcoholism

Tuberculosis Refresher Course

The Tuberculosis Educational Institute is arranging a refresher course on the pathology and immunology of tuberculosis, to be held at Oxford on September 19–22 Applications should be addressed to the institute's secretary Tavistock House North Tavistock Square, London, W C 1

Osler Club

At this society s annual dinner, to be held at the South Kensington Hotel, Queen's Gate Terrace, London, S W 7, at 7 45 P M on July 12, the Oslerian oration will be delivered by Sir Henry Souttar The society's hon secretary is Dr M J Linnett, 70 Shooter's Hill Road, London, S E 3

Medical Society for the Study of Venereal Diseases

This society s annual general meeting will be held on Friday July 28, at 7 30 P M, at 11, Chandos Street, London, W 1 Afterwards, Dr Robert Lees, the retiring president, will deliver his presidential address, entitled Random Reflections Dr Mary Michael Shaw will be installed as the new president

Threatened Withdrawal of Chemists in Northern Ireland

The *Times* (July 1) reports that Northern Ireland chemists have given three months notice of resignation from the health service in view of the action of the ministry of health and local government in imposing a deduction of 8% from the total payable to them for drugs and containers supplied and for professional services

Medical Conference at Verona

Two Nobel laureates, Prof G Domagk and Prof E Moniz are taking part in the International Medical Week which is being held at Verona from July 20 to 30 Other speakers will include Mr T Holmes Sellors, Mr C Brock, and Dr R P Liston (London), Prof H Olivecrona and Prof C Crafoord (Stockholm), Dr A Waksmann (New Brunswick) and Dr D B Dill (Maryland) Further particulars may be had from Prof Luigi Barchi, Pescheria Vecchia, 6 Verona, Italy

Medical Insurance Agency

The annual meeting of the Medical Insurance Agency was held in London on June 23 The report for 1949 disclosed a record amount of service to the profession (life insurance negotiated by the agency totalled about £2,976 000), a record total of rebates of premium, and a record profit available for medical charities New covenants were entered upon with the Royal Medical Benevolent Fund, the Royal Medical Foundation of Epsom College, and the Benevolent Fund of the British Dental Association Dr James Fenton was re elected chairman, and Dr Henry Robinson hon. secretary, of the committee of management

Reciprocal Health Service Arrangements with Jersey and Guernsey

A reciprocal health service agreement has been concluded between the Ministry of Health and the Department of Health for Scotland on the one hand and the States of Jersey and Guernsey on the other Under the agreement, Channel Islanders may use the facilities of the National Health Service (other than those relating to mental health and mental deficiency) free of charge and arrangements will be made for the admission of Channel Islanders to hospitals in Great Britain where adequate hospital facilities do not exist in Jersey or Guernsey As facilities are limited in the Channel Isles, and there is no free National Health Service there, a complete range of health service facilities cannot be offered to the large number of tourists from Great Britain who visit the Channel Islands each summer Jersey will, therefore provide free inpatient and outpatient hospital treatment, but no family doctor service Guernsey will provide free inpatient hospital treatment and a family doctor service No dental or ophthalmic treatment is to be provided by the States of either island All free facilities provided by the States are for tourists from Great Britain only and not for those who become resident in the islands The States are to pay the Ministry of Health for certain accommodation in mental deficiency institutions in England and for some laboratory facilities

Mental Health Conference

An informal conference to discuss better local coördinat. of home and hospital services in the sphere of mental hea. is to be held at the Town Hall, Salford, on July 14, at 2.30 P.M.

International Congress of Pædiatrics

The sixth international congress of pædiatrics is to be h. at Zürich from July 24 to 28 The congress proper will preceded and followed by two day courses of postgradu lectures The English speakers will include Prof J C Spence, Dr P L Mollison, Dr John Murray, Dr R R A Coombs, Dr C E Dent, Dr Mildred Creak, Prof A St. G Huggett, Dr Cicely Williams, Prof D R MacCalman, Pr Norman Capon, Dr Philip Evans, Dr C D S Aga Dr Denis Hill, Prof J M Smellie, Prof Dorothy Rus Prof Norman Dott, Dr F J Miller, Dr W R F Cell Dr F O MacCallum, Mr T Holmes Sellors, Dr J E Hutchison, Dr Martin Bodian, Dr Bernard Schlesinger, and Prof A A Monorieff

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The 1950 edition of the Register of Chiropodists has no been published Medical practitioners may obtain a cop without charge on application to the registrar, Board of Registration of Medical Auxiliaries, Tavistock House North Tavistock Square, London, W C 1

In view of the very large demand for copies, the trustee of the Carnegie United Kingdom Trust have decided to put on sale to the public Dr Stott's report on *Delinquency and Human Nature*, which was originally printed for private circulation only (see *Lancet*, 1950, 1, 963) The charge which is no more than a nominal one, and includes postage, is 5s in the sterling area or $1 in America Orders, with remittances should be sent direct to the trust Dunfermline, Fife Scotland The report is not available through trade channels

CORRIGENDUM *Kernicterus and Prematurity*—In the penultimate paragraph of Dr Gerrard's letter last week (p 35), line 11 should read "but if this is so *it would* explain why hypoglycæmia "

Births, Marriages, and Deaths

BIRTHS

ARCHER—On June 25 at Harrow the wife of Dr R M Archer—a daughter

GRAHAM—On June 27, in London the wife of Dr W V Graham—a daughter

HOWELL.—On June 23 in London the wife of Dr David Howell—a son

HOYTE—On June 28 the wife of Dr D A N Hoyte—a daughter

JOEL—On June 24 in London the wife of Dr L J R Joel—a son

JEFFERISS—On June 30 at Exeter, the wife of Dr Derek Jefferiss—a daughter

KENDALL.—On May 31, in Oxford the wife of Dr A C Kendall—a son

REID—On June 24 in London the wife of Mr D A C Reid, F R C S—a son and a daughter

RIDDELL.—On June 23 in London the wife of Dr Roland Riddell—a son

TULLY—On June 24 at Wigan the wife of Dr D R Tully—a daughter

MARRIAGES

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SIGNIFICANCE OF THE DISCOVERY OF THE EFFECTS OF CORTISONE ON RHEUMATOID ARTHRITIS *

G W PICKERING
M.A., M.B Camb, F R C.P
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF LONDON, PHYSICIAN TO ST MARY S HOSPITAL

THE discovery by Hench and his colleagues, announced a year ago, that 'Cortisone,' or Compound E of Kendall, exerted a dramatic beneficial effect on both objective and subjective disturbances of rheumatoid arthritis, may be likened to Magellan's discovery of the straits that bear his name For although the existence of a vast ocean beyond the Americas had been known since the conquistadores crossed the continent, its exploration had been delayed by the absence of any known inlet from the seas of the Old World The discovery of the effect of cortisone, and later of the similar effect of adrenocorticotropic hormone (A C T H), not only on rheumatoid arthritis but on a variety of diseases of hitherto unexplained pathology, seems to provide a means by which their pathology and pathogenesis will ultimately be solved This is the great significance of the discovery But there is another side which must be mentioned first

EXPERIMENTAL APPROACH TO THERAPEUTICS

It has long been apparent that therapeutics should be an experimental science There is only one basis for using a therapeutic agent—namely, that it acts beneficially in the particular disease in which it is used Therapeutics treated in the traditional manner, as applied pharmacology, is a legacy of an age the therapeutic poverty of which is shown by the long lists of mixtures whose only virtue in many instances is their harmlessness to the recipient

The use of the experimental approach to therapeutics has already revolutionised our conception of many diseases, particularly the anæmias and the nutritional deficiencies Hench's discovery of cortisone was not a flash in the pan, it was the fruit of a lifetime's use of the experimental method in the treatment of rheumatoid arthritis For Hench applied this method to every treatment that has been suggested, with most of them the therapeutic effects were doubtful, although occasionally dramatic improvements were seen The two most consistently beneficial agents were pregnancy and jaundice One by one the possible substances that might be increased in these two conditions were tried, until eventually sufficient Compound E became available This happened curiously as a side effect of war It was suspected that adrenal steroids were being manufactured in Germany with the object of improving the efficiency of the Luftwaffe pilots, and their manufacture on a large scale was therefore started in the United States When Compound E became available it was tried in rheumatoid arthritis with such care that its effects were clearly demonstrated in the first patient treated (Hench et al 1949)

My tribute to the work of Hench and his colleagues is all the more sincere because I failed in a similar quest myself This story I will relate briefly

I began with the idea that since the pathology of rheumatoid arthritis was quite unknown it might be discovered by chance observation based on any hypothesis, however absurd, and that the most likely field in which to make a chance discovery was in the field of therapeutics In 1939, on published accounts, the most effective therapeutic agent in rheumatoid arthritis seemed to be gold I could not believe that gold was acting by restoring a deficiency of the metal, and it seemed possible that the effective agent might be an impurity in the gold preparations present in minute quantities

Professor Dingle, then of the Imperial College, kindly made a spectographic analysis of four gold compounds This revealed many impurities, most of which were obviously of no significance, such as sodium and calcium Professor Dingle was, however, impressed by the presence of barium, which he found in mother's milk To get a further lead I took (in carefully cleaned glass syringes) the blood from three patients with rheumatoid arthritis, one of whom had been treated with gold, and three normal subjects of similar age and sex, I put them in specially cleaned and identical tubes and sent them to Professor Dingle He found by spectographic analysis that the metallic components of the two series were identical except for the presence in the rheumatoid arthritis patients' blood, of a gold line, slightly stronger lead and aluminium, and slightly weaker lithium and barium lines

I therefore began treatment with barium chloride My first case was a boy aged 17 whom I had had under observation for ten months with a severe widespread rheumatoid arthritis He had not responded to gold and other treatment I gave him barium chloride in half-grain doses by mouth three times a day for ten days, during the latter part of which he showed albuminuria and hypertension which disappeared when barium was stopped His arthritis was dramatically relieved He was discharged from hospital and returned to work and had remained well two years later when I last heard from him

This seemed like the great therapeutic discovery of which I had dreamed, but unfortunately I have never been able to obtain albuminuria, hypertension, or a significant effect on rheumatoid arthritis with barium chloride in any subsequent case In fact, before Hench's discovery, I had come to the conclusion that the effects of known therapeutic agents in rheumatoid arthritis were quite unpredictable, and it seemed to me that the changes I was witnessing were no more than the spontaneous remissions and relapses of a chronic disease

I have related this fruitless experiment partly to draw attention to the fact that there is no disease as yet recognised in man that corresponds to the trace-element diseases so fully recognised and described in domestic animals and in plants by the Australian veterinary and agricultural research workers

CAUSES OF DISEASE

To return to the problems of the pathogenesis of rheumatoid arthritis and the other so called rheumatic diseases I will not attempt here to define disease but will merely remind you that the state in which the animal finds itself at any time is determined by two prime factors—its inherited constitution and the effects of its environment, past and present The common causes of disease thus include

1 Inborn and inherited abnormalities (e g, hæmophilia)
2 The effects of excess of a chemical agent in the environment (poisoning e g, lead poisoning)
3 The effects of a deficiency of a chemical substance (deficiency diseases e g, beriberi)
4 Infection or infestation by viruses, bacteria, fungi, or animal parasites.
5 Physical trauma

It is to be noted that a possible additional category may exist in this system which is as yet unrepresented by any known disease, comprising diseases due to the absence or deficiency of microbes that normally live in or on their host and contribute to his welfare

If we take up a textbook of medicine and we list the diseases that can be attributed to the above causes we find that there is an enormous residue in which the cause is not known It seems possible that many of these diseases will prove to belong to the above categories, singly or in combination, but we must be alive to the possibility that there exists a group or groups of diseases

* A lecture given at St Stephen s Hospital, Fulham, introducing a postgraduate weekend course on rheumatic diseases

the causation of which we do not comprehend, or comprehend but dimly To this category belong the rheumatic diseases and other important maladies such as peptic ulcer and ulcerative colitis

In the present century three hypotheses of disease have attempted to explain these maladies

Focal Sepsis ?

First came the hypothesis of focal sepsis This supposed that a small localised infection could produce generalised disease, the remote manifestation being attributed to either bacterial dissemination, allergic tissue responses, or absorption from the focus of "toxins" In addition to the diseases above mentioned, the anæmias, nephritis, and many other conditions were attributed to this cause

As a student I never understood the appeal of this hypothesis to my teachers It had three gross defects

1 As far as I knew it had never been shown, in a manner that would stand a critical analysis, that there was a significant association between the presence of a septic focus on the one hand and the disease in question on the other I personally saw many patients with obvious septic foci but without these diseases, and many with *these diseases but without obvious foci*
2 In many cases, there seemed to be no demonstrable effect on the course of the disease from removing the foci.
3 It was difficult to explain why (*a*) a variety of organisms *should cause the same disease entity*, and why (*b*) a single organism should cause a variety of disease entities

I think the absence of any appeal in the hypothesis for a critically minded student, and its acceptance by his teacher who had been in practice for many years, was probably to be explained along the same lines as Lincoln's explanation of why North and South looked at the question of slavery in an entirely different light As Lincoln said, "the South sees the question through a wad of two billion dollars"

Psychosomatic Origins ?

The hypothesis of focal sepsis is now almost dead and buried Its place has been usurped by the psycho somatic hypothesis which attributes disease to certain abnormal states of the mind The rise of this hypothesis to dominance took place after the anæmias had begun to yield their secrets to the method of experimental therapeutics, but apart from this it has inherited much the same list of diseases, including rheumatic diseases, ulcerative colitis, and peptic ulcer But, again, to a simple minded student the same objections arise as to the hypothesis of focal sepsis

1 It has not been demonstrated that there is a significant association between the abnormal mental states and the diseases in question
2 Psychotherapy seldom produces dramatic or repeatable effects in these diseases
3 The hypothesis fails to account for (*a*) the variety of mental states causing the same disease entity, and (*b*) a single mental state being associated with a variety of disease entities

The small amount of critically established fact on which these two hypotheses were based can probably be accounted for on the fact that the condition of any patient suffering from a chronic disease deteriorates when there is superadded infection or disturbance of the mind

Diseases of Adaptation ?

The last recruit to this series of general hypotheses is the theory of diseases of adaptation put forward by Hans Selye, of the University of Montreal Selye has studied the resistance of experimental animals to a variety of stresses, such as severe infection, poisoning, intense muscular exercise, exposure to cold, solar or rontgen irradiation, nervous stress, and fasting and has described a series of systemic reactions of the body following continued exposure to these agents These reactions he calls the general adaptation syndrome Among the most prominent effects are enlargement of the adrenal cortex with increased corticoid secretion, involution of the thymus and other lymphatic organs, gastro intestinal ulcer, metabolism changes, and variations in the resistance of the animals

Selye (1946, 1949) divides the adaptation syndrome into three successive stages The first, the alarm reaction, has two phases—the phase of shock in which the changes found represent the damaging effects of the agent, and the phase of counter shock in which the signs and symptoms of shock tend to be reversed, and in which the changes in size and function of the endocrine and lymph glands begin to show themselves The second stage is *the stage of resistance*, which is essentially a prolongation of counter shock In this stage resistance is increased to the particular agent to which the body has been exposed, but decreased to other types of stress The third stage is that of exhaustion, in which the mechanism previously endowing the animal with resistance ceases to operate and the animal reverts to the stage of shock which is shortly succeeded by death

Selye has produced evidence that many of the changes which are features of the adaptation syndrome are effected through the hypophysis, whose secretions affect the relevant tissues of the body and particularly the adrenal cortex It is, above all, Selye thinks, the secretions of the adrenal cortex which produce changes on which resistance depends, and which are concerned in what he calls the diseases of adaptation

The concept of the diseases of adaptation derives from the finding of certain lesions in the tissues of animals exposed to injurious agents, and in particular the lesions produced by injecting desoxycorticosterone into animals sensitised by high salt intake or nephrectomy A list given by Selye (1949) of the diseases of adaptation is as follows

DISEASES OF ADAPTATION DUE TO ENDOCRINE DISTURBANCES

1 *Hyperfunctional*
  (*a*) Primary diseases of endocrines which participate in the general adaptation syndrome
    1 Cushing's disease (pituitary hyperfunction)
    2 Adrenal tumours with Cushing's syndrome (adrenal cortical hyperfunction)
    3 Chromaffinomas (adrenal medullary hyperfunction)
    4 Coarctation of the renal artery and other primary diseases of the kidney conducive to hypertension (renal hyperfunction (hormonal))
  (*b*) Secondary diseases due to excessive (or abnormal) response of endocrines to stress
    1 Some types of hypertension
    2 Periarteritis nodosa (also arteriosclerosis and other vascular lesions ?)
    3 Nephrosclerosis
    4 Some types of nephritis (?)
    5 Rheumatic disease (?)
    6 Waterhouse Friedrichson syndrome
    7 Eclampsia (?)
    8 Accidental thymus involution
    9 Some types of tonsillitis (?)
    10 Some types of appendicitis (?)
    11 *Gouty arthritis (?)*
    12 Some types of diabetes
2 *Hypofunctional*
  (*a*) Primary diseases of endocrine which participate in the general adaptation syndrome
    1 Simmonds's disease (pituitary hypofunction)
    2 Addison's disease ("status thymicolymphaticus" (?) adrenal-cortical hypofunction)
  (*b*) Secondary diseases due to insufficient response of endocrines to stress
    1 Secondary shock (relative hypocorticoidism (?))
    2 Acute gastro intestinal erosions ("Curling's ulcer")

Selye's conception of the causation of these diseases is as I understand it, approximately this An individual is subjected to a stress, such as severe infection, poisoning intense muscular exercise, exposure to cold, a severe mental strain, or fasting The adaptation syndrome, with all its complex endocrine changes, is brought into play, but one of the secretions is of abnormal magnitude or perhaps the structures on which it acts are abnormally sensitive, and the corresponding set of pathological changes, with their *clinical counterpart*, ensues

This hypothesis is suspiciously like its predecessors, the hypotheses of focal sepsis and of the psychosomatic

origin of organic disease, and my own first reaction to it was unfavourable I thought it tried to explain too much on too little evidence, and that the same kinds of criticism which could be levelled against the two other theories were applicable equally to it For instance there are many examples of these diseases in which it would be difficult adequately to define the initiating stress, and many examples in which the stress occurred without the disease And I still find it hard to believe that diseases having such different incidence, different pathologies and different courses, as the diseases Selye has listed, can arise from one and the same mechanism

It is worth noting, however, that Selye's hypothesis is more solidly backed by experimental evidence than its predecessors Moreover the great weakness of the hypothesis of focal sepsis and of the psychosomatic hypothesis is the relative inefficacy of therapeutic measures which it prompted Hench's discovery, which incidentally was made quite independently of this hypothesis, showing that one of the secretions of the adrenal gland would abolish many features of the pathological changes of rheumatoid arthritis, at once made the new hypothesis more plausible—especially when it was found that cortisone effected dramatic improvement in other diseases and that similar effects were produced by the adrenocorticotropic hormone of the pituitary gland The first publication of the effects of cortisone is now only a year old, and the information about these diseases responding to A C T.H. is notably incomplete Much of the evidence remains unpublished, and any list will probably require revision both by elimination and addition when more information is available On present information, the following conditions respond

Rheumatic fever	Dermatomyositis
Rheumatoid arthritis	Lymphatic leukæmia
Psoriasis	Ulcerative colitis
Lupus erythematosus	Bronchial asthma
Polyarteritis nodosa	Urticaria

This is not the time nor the place to enter into a detailed discussion of the validity of Selye s hypothesis It will serve its purpose by stimulating inquiry, and it will stand or fall as a result of the facts revealed by observation and experiment One caution is, however, very necessary The history of medicine shows how great is the tendency for a tentative and imperfectly documented hypothesis to assume the guise of a so-called fundamental principle This tendency is particularly great in the diseases here considered, whose causation has hitherto been shrouded in impenetrable darkness, now at last dimly lit

HOW DOES CORTISONE ACT ?

With this background we may turn to consider more closely how it is that these substances improve the diseases listed

On Selye's hypothesis, the diseases might be produced by excess of the mineralocorticoid secretion of the adrenal not balanced by a corresponding secretion of glucocorticoid Administration of cortisone would correct this disturbed equilibrium directly, and A.C T.H would correct it indirectly The difficulty in accepting this hypothesis is this Administration of deoxycortone in large doses to man is known to produce œdema and hypertension, the hypertension being prevented by simultaneous dosage with cortisone But overdosage with deoxycortone in man, has, as far as I am aware, never produced any of the maladies in my second list Nor are the classical signs of deoxycortone overdosage—œdema and hypertension—found as a rule in these diseases Unless, therefore, the mineralocorticoid in question is one with properties very unlike deoxycortone, it cannot be accepted that overproduction of these substances produces these diseases

The diseases are obviously not due to a total deficiency of suprarenal secretion, since they are never or seldom seen in association with Addison's disease It is possible that while the secretion of mineralocorticoids is normal, the secretion of the glucocorticoids is diminished This would explain the action of cortisone producing a remission in these diseases during its administration The recent observations of Sprague and others, including Hench and Kendall, are relevant to this theme (Sprague et al 1950) They report the effects of cortisone on 26 patients treated with 74 to 200 mg (of acetate) per day for long periods Many of these patients developed rounding of the facial contours, and one patient who received cortisone for 187 days developed acne and hirsutism Other features of Cushing's disease were keratosis pilaris, muscular weakness, œdema, amenorrhœa, cutaneous striæ, mental depression, impairment of carbohydrate tolerance, negative nitrogen balance increased excretion of corticosteroids in the urine, and alkalosis with diminished blood chloride and potassium Significant hypertension was observed in only 1 case The doses used produced remissions in rheumatoid arthritis and rheumatic fever, disseminated lupus erythematosus, psoriasis, and psoriatic arthritis, but the rheumatoid changes returned after the treatment was withdrawn

What we do not yet know is whether the smallest doses necessary to produce a remission in these diseases will if continued over many months, produce the symptoms of Cushing's disease If so, then it seems unlikely that a simple deficiency of glucocorticoid secretion is a factor in pathogenesis Support to this idea is given by the work of Thorn and Bayles (1949) who have found that 10–20 mg cortisone per day is sufficient to maintain the health of a patient with complete adrenal insufficiency, while 100 mg per day is necessary to produce significant changes in rheumatic diseases They state that "effective therapy is only attained when the level of the hormone is clearly increased either from subnormal to above normal or from normal to above normal" Clearly, however the problem of the amounts actually secreted must await a satisfactory method of assay

A C T H

The conditions benefited by A C T.H and cortisone have certain features in common Some of them, such as rheumatoid arthritis, periarteritis nodosa, scleroderma, and lupus erythematosus, are diseases that are said to affect particularly the structure of collagen, and are sometimes grouped as "collagenoses" Others, such as urticaria and asthma, are known to be associated with a hypersensitivity state, in which the tissue reactions to specific chemical substances are abnormally intense Each of these leads is worth following

These hormones may profoundly affect the tissue cells A C T.H decreases conspicuously the number of circulating eosinophils and diminishes the amount of lymphoid tissue Thorn and his colleagues have shown that the disappearance of eosinophils from the blood after A C T.H depends on the presence of the adrenals and is therefore mediated by a substance secreted by the adrenals Sprague and his colleagues find that prolonged administration of cortisone produced a small but significant increase in the total number of leucocytes but no significant change in eosinophils or lymphocytes, while A C T.H led to complete or almost complete disappearance of eosinophils Thus these changes in white blood-cells would seem to depend on the secretion by the cortex of a substance other than cortisone, possibly Compound F More significant are their effects on tissue reactions It is said that wounds show diminished power of healing and abscesses reduced formation of granulation tissue in patients (or animals) to which the hormones are being administered. It is evident then that these hormones have a very profound effect on the tissue reactions of the body apart from the diseases which they relieve

On what exactly this effect depends is still unknown, but it seems to me that here may lie the answer to the riddle of these diseases

Bordley et al (1949) have reported dramatic improvement with A C T H, given in doses of 30–100 mg daily for 11–21 days, in such maladies as severe exfoliative dermatitis, giant urticaria due to penicillin, and bronchial asthma "In two patients there was complete obstruction of the nose by polyps These began to shrink on the third day of treatment and by the end of therapy had completely vanished in one, and almost completely in the other" Long and Miles (1950) have investigated the effects of thyroxine and of cortisone on the tuberculin reaction in the guineapig sensitised by B C G They have shown that thyroxine enhances the sensitivity to tuberculin, while cortisone reduces it After stopping cortisone, the sensitivity is increased for a while beyond the normal, just as the rheumatoid changes may be increased after withdrawal of the drug Thus there seems to be clear evidence that the cortical secretions affect certain kinds of tissue hypersensitivity, but again it is unknown how this is brought about

SIGNIFICANCE OF THE DISCOVERY

Sprague and his colleagues concluded that it was not yet possible to account for the action of cortisone or A C T H in disease by any effect of these substances as yet fully understood, and in spite of a spate of recent publications that position remains unchanged It is evident that cortisone and A C T.H modify tissue responses, and that many of the diseases listed show a peculiar tissue response that is annulled by these agents What is the essential peculiarity of this tissue response and how it arises are questions that we cannot yet answer What is clear is that in these compounds we have new tools with which to attack some of the more obscure reactions of the body, and that the result of this attack may be the recognition of a new category in the causation of disease That, it seems to me, is the significance of this great discovery And while we must recognise that behind this discovery is a vast effort by chemists, biochemists, and experimental biologists, I would emphasise that the discovery itself was in the field of experimental therapeutics

Finally a word about practical therapeutics Although it is too early to form a final opinion, it appears probable that the effects of cortisone or A C T H are curative in certain self-limited diseases such as rheumatic fever But in chronic diseases, such as rheumatoid arthritis, the signs and symptoms recur after stopping treatment Moreover it seems, though it is by no means certain, that the minimum dose of cortisone or A C T H necessary to produce a remission in these diseases also produces undesirable side effects such as the manifestations of Cushing's syndrome already mentioned. Another adrenal constituent or a close chemical relative may prove to be more effective than cortisone and to act in doses that have not these adverse consequences New knowledge of the disease processes concerned may produce completely new remedies It is to be hoped therefore that cortisone and A C T H may ultimately be displaced as therapeutic agents by something whose effects are more narrowly confined to the fundamental disturbance in these diseases

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INVESTIGATION OF THYROID FUNCTION AND DISEASE WITH RADIOACTIVE IODINE *

E E POCHIN
M.D Camb, F R C.P
DIRECTOR, DEPARTMENT OF CLINICAL RESEARCH, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON

(*Concluded from p 46*)

Second Phase of the Iodine Cycle Retention in the Thyroid

The thyroid concentration of administered radio iodide is largely complete within 2–3 days in normal subjects and often within 12 hours in Graves's disease The radio-iodine so concentrated is at first retained in the thyroid before circulating as thyroxine and finally returning from the tissues to re-enter the iodine cycle (fig 8)

The amount of radio iodine retained within the thyroid can be accurately followed by measuring the counting rate opposite the neck during the first weeks after the dose In normal subjects, and in most patients with untreated Graves's disease, the total thyroid content

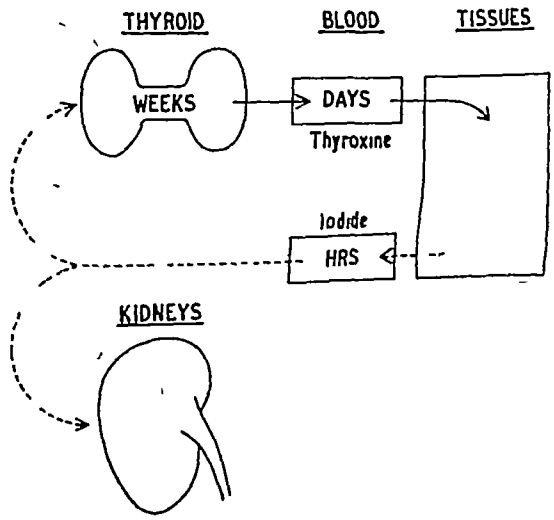


Fig 8—Radio-iodine cycle indicating approximate periods of stay of iodine at different stages of the cycle

of radio iodine falls by only a small percentage of its value each day, the normal average fall representing a daily loss of 0 6% of the dose The fall is usually more rapid in Graves's disease, averaging 6% per day

These values clearly measure the over all loss by the gland—namely, the difference between its output and any intake that may be continuing To determine the daily output, therefore, we must first know, and allow for, the intake This cannot be determined directly, but can be estimated if certain assumptions are justified We have seen that the original dose of radio iodide was shared between thyroid and kidney in the ratio of their plasma clearance rates, the thyroid uptake rate at any time being in this proportion to the renal excretion rate If at later periods the thyroid and kidneys are again taking up iodine as it returns from the tissues in the form of iodide, the same relationship should hold, and the thyroid uptake rate should be calculable from the urinary excretion rate, if the proportion between the

* The Oliver Sharpey lectures delivered at the Royal College of Physicians of London on March 14 and 16 Based on work undertaken for the Medical Research Council, in conjunction with B D CORBETT B A., the late E A G GOLDIE, M B, A J HONOUR and N B MYANT B.M

clearance rates has been determined This assumption would not hold if radio iodine, while circulating in organic combination, were also taken up directly by thyroid or kidneys in appreciable amounts, but we have obtained some evidence that this is not an important source of error When synthetic crystalline thyroxine, labelled with radioactive iodine atoms, is given intravenously to man, we have found radio iodine only to appear slowly either in the thyroid or in the urine (Myant and Pochin 1950) In both there is some concentration of radio-iodine, which is probably due largely to liberated iodide being concentrated in the usual way, as the rates of thyroid and urinary radio iodine accumulation are in about the ratio as normally observed after radio iodide Further work is needed on the human thyroid uptake and renal output of the iodotyrosines and other organic iodine compounds, but it appears that the thyroid uptake-rate may be calculated from the renal excretion rate with sufficient accuracy for the present purpose

In normal subjects the initial rapid excretion of radio iodine is over within the first 3 days Thereafter, urinary excretion continues at a low but roughly constant rate, which averages 0 4% of the dose per day Since the normal thyroid clearance is about three quarters of the renal clearance, the continuing thyroid uptake should at this period be about 0 3% per day, on the assumption made Meanwhile the over all loss from the thyroid averages 0 6% of the dose per day, so that the daily output must be 0 9% of the dose In Graves's disease the thyroid, after an initial large and rapid uptake, decreases in radio iodine content by 6% of the dose per day despite a high continuing daily intake of 8%, indicating a daily output by the gland of 14% of the dose

The mean stay of a radio iodine atom in the gland may be calculated from knowledge of the proportion of such atoms which are discharged each day In twelve patients with Graves's disease an average of 20% of the gland's radio iodine content was discharged daily, which implies a mean length of stay of about 5 days, the value ranging in different cases from 1 to 17 days In eight subjects without thyroid disease, an average of 3% of the gland's radio iodine was discharged daily The normal mean stay is thus considerably greater than in Graves's disease and, if the proportion of radio iodide atoms discharged daily remained constant, would be about 5 weeks Further work is needed to justify the calculation of thyroid intake from urinary output, but it is clear that the time spent by iodine atoms in each passage through the thyroid gland in Graves's disease is greatly reduced and commonly to one tenth of its normal value The acceleration of thyroid iodine turnover may thus be as great as the acceleration of iodide uptake

Third Phase of the Iodine Cycle Circulation as Thyroxine

In the third phase of the cycle, iodine is discharged from the thyroid in organic combination and circulates in the blood-stream, probably as thyroxine in loose combination with plasma albumin We may examine the kinetics of this phase by following the plasma radioactivity and may form some estimate thereby of the length of time spent by iodine in the plasma as thyroxine It is useful to consider first the findings in Graves's disease In these patients, the plasma radioactivity, which falls rapidly in the first few hours while the dose, in the form of iodide, is being removed from the blood stream, begins to rise again within a day as radioactive thyroxine begins to be liberated Such radiothyroxine has been detected within 3 hours of the dose in one case, and repeatedly within 7 hours in Graves's disease Correspondingly, the total plasma radioactivity passes its minimum and starts to rise by 9 hours

In its subsequent course, the plasma radioactivity probably measures radiothyroxine content to a close approximation, with iodide contributing only slightly to the total radioactivity By the method used, it has not been possible to detect and separate countable amounts of radio iodide in the presence of radiothyroxine at this stage The maximum possible content of free radio iodide can, however, be estimated from a knowledge of the renal excretion rate, and of the renal clearance for iodide On this basis, it is estimated that radio iodide has been responsible for under 3% of the plasma radioactivity in thyrotoxic subjects, subsequent to one day from the dose The plasma radioactivity curve therefore probably represents the course of radiothyroxine accumulation in the plasma The average value in a group of cases of Graves's disease rises towards a maximum concentration which is reached within a few days and is then maintained for many days (Myant and Pochin 1949) This form of plasma concentration curve is readily interpreted It is of a type to be expected on mathematical grounds if radiothyroxine enters the circulation at a constant rate, but leaves it at a rate proportional to its concentration therein The first condition holds in these cases, since the rate of radio iodine output from the thyroid is about constant over the first few days, so that radiothyroxine is probably entering the circulation at a steady rate The second condition should also hold, since radiothyroxine molecules are indistinguishable chemically from the much greater and relatively constant number of circulating normal thyroxine molecules The number of radiothyroxine molecules which happen to be metabolised each day should thus depend on the proportion present—that is, on the concentration of these radiothyroxine molecules in the plasma Under these conditions we should expect the plasma radiothyroxine concentration to rise exponentially towards a plateau value, and this is observed

To express this conclusion algebraically, if the constant rate of output is A, and if a constant fraction f of the radiothyroxine molecules is removed each day, then the plasma concentration x should vary with time t so that

$$\frac{dx}{dt} = \frac{A}{V} - fx$$

whence

$$x = \frac{A}{Vf}(1 - e^{-ft})$$

where V is the body thyroxine space The plasma concentration should approach a limiting concentration of value $\frac{A}{Vf}$ from which A may be estimated, as discussed later It should approach it exponentially with a time constant determined

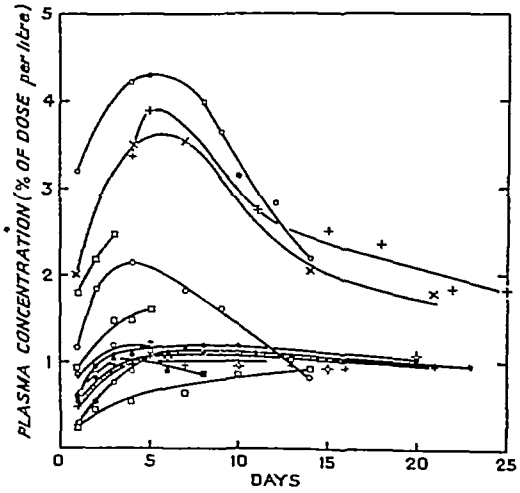


Fig 9—Plasma radio-iodine concentration in patients with Graves's disease in the weeks following a dose

by the value of f, and the mean life of the circulating thyroxine molecule should be equal to 1/f

This interpretation is also consistent with the data from certain thyrotoxic patients in whom the thyroid output is initially much more rapid but decreases substantially during the first few days after the dose (fig 9) In these patients, it is found that the plasma radio iodine also rises to a concentration which is initially high but falls progressively after a maximum value at about the 5th day, and this type of curve would be expected in view of the decreasing rate of thyroid output during this period In both groups of cases, it is assumed that the diffusion of thyroxine through the body tissues is rapid compared with the process of its removal, and some evidence that this is so has been obtained by giving synthetic crystalline radiothyroxine intravenously when the final distribution through the body is approached within a few hours of the dose (Myant and Pochin 1950)

It will be observed that, although the maximum plasma concentration varies considerably in different patients, this maximum value is attained in roughly equal times, the curves usually rising to half their greatest height by between 1 and 2 days (see table) If the interpretation of the form of these curves is correct, the mean lifetime of radiothyroxine in the circulation may be estimated from them For, as is shown above, the time in which the plasma radiothyroxine reaches half its limiting concentration will be equal to that in which half of any group of radiothyroxine molecules disappear from the circulation or body fluids The average half time in twelve thyrotoxic patients has corresponded to a mean lifetime of 2 days for a circulating thyroxine molecule in Graves's disease In normal subjects the plasma radio iodine rises to a lower limiting concentration which is probably reached in about the same time as in Graves's disease or perhaps somewhat later, but the speed of this phase of the iodine cycle appears to be much less affected than are those of the thyroid uptake and discharge

It may be noted here that the "mean lifetime" strictly refers to the period until either the thyroxine molecule is removed from plasma and the fluids in equilibrium with it, or the radio iodine atom is removed from the molecule Since the biosynthesis of thyroxine after tracer doses of radio iodide occurs in the thyroid in the presence of large concentrations of normal iodide, it is highly unlikely that any thyroxine molecule will contain more than one radio iodine atom. We may therefore be studying the survival of iodine in thyroxine molecules of four types, labelled in the 3, 5, 3′, and 5′ positions. If the stability of iodine depends on the aromatic ring to which it is attached, the radiothyroxine of which the mean lifetime is studied may be a mixture in equal parts of two types of unequal lifetime In this respect, radiothyroxine synthesised artificially by radio iodination of 3,5-diiodothyronine using carrier free radio iodide may differ from biosynthesised radiothyroxine in uniformity and in survival as such within the body

LATE PLASMA RADIO IODINE CONCENTRATIONS IN GRAVES'S DISEASE

Age	Sex	B M R (%)	Highest concn of I^{131} reached (% dose per litre)	Time to reach half highest conc (days)	Mean stay (days)
Untreated Graves's disease					
26	M	+ 13	0 9	0 9	1 3
33	M	+ 78	1 1	1 2	1 7
52	M		1 1	1 0	1 4
52	F	+ 48	1 1	0 9	1 3
68	F	+ 44	1 2	1 0	1 4
37	M	+ 43	1 2	2 2	3 2
45	M	+ 67	2 5	0 7	1 0
55	F	+ 65	3 6	0 8	1 2
28	F	+ 49	4 3	0 7	1 0
			Mean value	1 0	1 5
			Standard error	*0 16*	*0 22*
Thiouracil given before plateau or peak concentration established					
38	M	+ 35	0 8	4 0	5 8
55	M	+ 60	0 9	2 0	2 9
20	F	+ 55	1 1	1 5	2 2
21	F	+ 52	1 4	1 8	2 6
52	F	+ 55	1 7	0 8	1 2
28	F	+ 44	2 2	0 9	1 3
61	F	+ 77	3 9	2 5	3 6
			Mean value	2 0	2 8 or over
			Standard error	*0 41*	*0 60*
			Mean value for all cases	1 4	2 1 or over

In myxœdema, as in Graves's disease under thiouracil treatment, no later rise in the plasma radio iodine has been detected in the week following the dose

We may hope to carry the analysis of thyroxine metabolism a little further, although the conclusions must at present be tentative

Suppose that a patient achieves a plasma concentration of thyroxine equivalent to 2% of the dose per litre Suppose also that we accept a diffusion space of 15 litres for this thyroxine, based on that for crystalline radiothyroxine injected intravenously This would imply that 30% of the dose is present as thyroxine If now we estimate the lifetime of this circulating thyroxine, we may calculate the rate at which thyroxine must be entering and leaving the circulation to maintain this level If, for example, the mean lifetime is one day, then 30% of the dose must leave the thyroid each day as thyroxine

We thus obtain the gland's daily output of radiothyroxine But we already have an estimate of its total daily output of radio iodine in all forms We may therefore hope to establish what proportion of its discharged iodine is in the form of thyroxine It will be of interest to find out whether the same proportion of iodine is put out as thyroxine in Graves's disease as in normal conditions, or to investigate the biochemical possibility that one molecule of diiodotyrosine is liberated for every thyroxine molecule discharged from the thyroid At present, however, the diffusion space for normal body thyroxine cannot be stated with certainty It is found that crystalline thyroxine is distributed through about 15 litres in normal subjects On the other hand, if the plasma of a patient under radio iodine treatment for thyrotoxicosis is injected intravenously in man, the radio iodine compounds present may remain concentrated in a few litres only of the recipient's circulation, and the cause of this discrepancy is not yet clear Calculations on a small group of thyrotoxic subjects have shown, however, that if the 15 litre space is assumed for thyroxine as normally discharged into the circulation by the thyroid, there is an approximate equivalence between the thyroid output of radio iodine and the output in the form of thyroxine This subject requires considerably fuller and closer investigation, but the use of radio iodine appears to be capable of giving an answer to the question

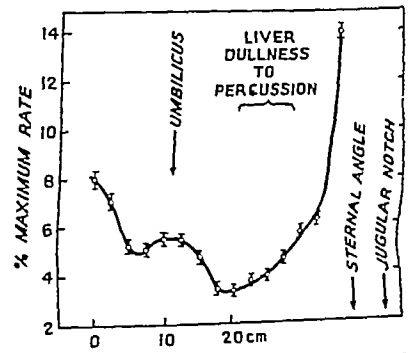


Fig 10—Distribution of radio-iodine in chest and abdomen (anterior midline measurements) on the day following a dose, showing concentration in thyroid renal and bladder areas Ranges indicate ± 2 S E.

The Complete Iodine Cycle

We have now traced the circulation of iodine through three phases of its body cycle, and obtained some estimate of its normal length of stay in each phase

ig S)—namely, for a matter of hours as iodide in the lood (say, 6–S hours in normals and 1–2 hours in raves's disease), for weeks in the thyroid (perhaps for weeks in normals and 1 week in Graves's disease), nd probably for a few days only as thyroxine in the lood

If thyroxine is then broken down in the tissues and he radio iodine released again as iodine into the plasma, : will either be excreted in the urine or be taken up by he thyroid to re enter the same metabolic cycle The nportance of this recirculation of iodine can be seen in ome patients with Graves's disease in whom the whole odine cycle is rapid and, because the thyroid clearance s high relative to the renal clearance, most of the iodide eturning to the plasma from the tissues re enters the vcle In one such patient radio iodine was found to e re entering and flowing through the thyroid in amounts exceeding the original dose each day, so that some iodine atoms must have completed the whole body cycle in less than a day A rough estimate can be made of the average time of a complete circuit of the body

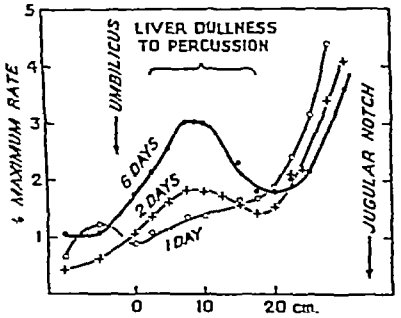


Fig 11—Distribution of radio-iodine at one two and six days after a dose in a patient with Graves s disease showing concentration in liver area appearing on second day

Taking a very simplified argument suppose that a dose of radio iodine is given intravenously to a subject in whom the thyroid and renal clearances happen to be equal The radio iodine will be shared so that 50% is excreted in the urine and 50% is concentrated in the thyroid If the 50% from the thyroid now completes its circuit of the body once and reappears in the plasma as free iodide, it should again be shared equally between thyroid and kidney, 25% now going to each. The time at which this circuit is completed should thus be marked by the excretion of a further 25% of the dose in the urine The next cycle is marked by the excretion of half the remainder and so on repeatedly, the duration of each cycle therefore being established.

In effect, we are comparing the total amount of radio iodine left in the body with the amount that flows out of the tissues each day, and so estimating the number of days that must elapse before it all has passed once round the cycle It may thus be possible to estimate a time for the total circuit by comparing the urinary excretion-rate with the amount of radio iodine remaining in the body, provided the thyroid and renal clearances are known

This is clearly an over-simplified presentation It is likely, for example, that some iodine atoms will have started a second circuit before all have finished the first It is unknown whether iodine is liberated from the tissues only in the form of iodide Finally, it is uncertain—and perhaps on biochemical grounds unlikely—that iodine atoms are liberated from the thyroid *only as thyroxine* If some are discharged as diiodotyrosine these may be liberated as iodide much sooner than those discharged as thyroxine and the estimated time of

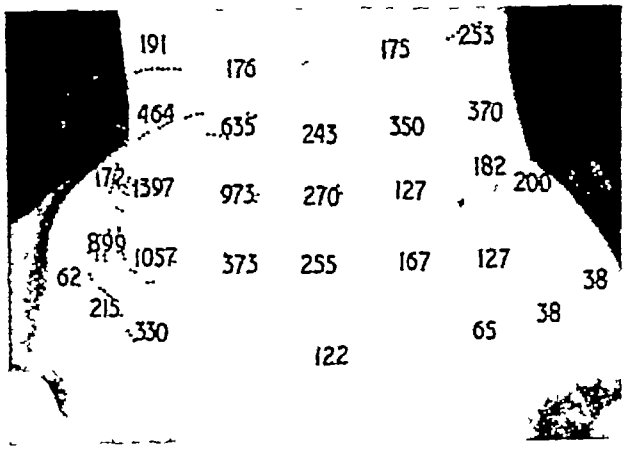
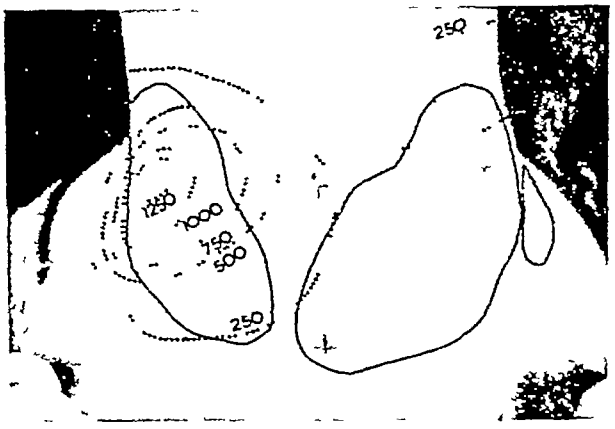


Fig 12—Carcinoma involving left lobe of thyroid Counting rates at different positions on the neck with contours interpolated at 250 counts per minute intervals

circuit would be intermediate between that for thyroxine and that for diiodotyrosine These points must be the subject of further work It can, however, be stated that the total time of circuit calculated on these assumptions is in rough agreement with the sum of the estimated times of stay in thyroid and in plasma as iodide and thyroxine, which suggests that any further time of stay in tissues may be short

If therefore we summarise our information on the circulation of iodine, the normal cycle appears to be as follows Intravenously injected iodide distributes



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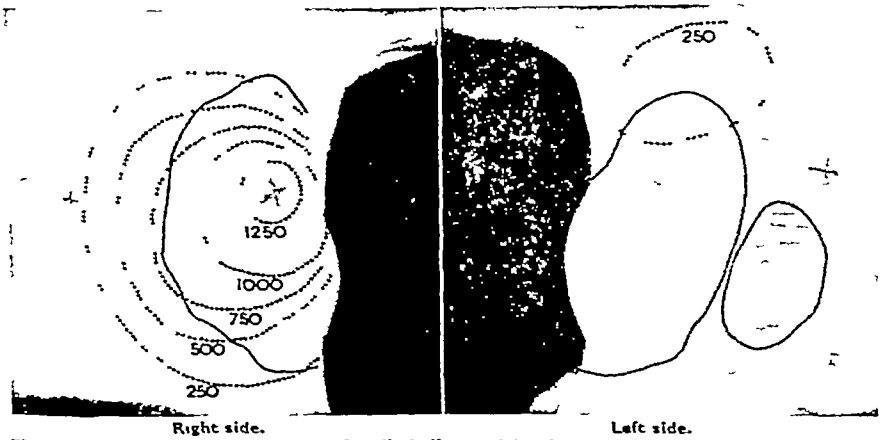


Right side. Left side.

Fig 13—Relation between contours of radio-iodine activity (dotted lines) and structures palpable in neck (continuous lines) Case as in fig 12.

through the equivalent of 20 litres or one third of the body-weight in the course of 2 hours, entering saliva and gastric juice in high concentration and entering red cells rapidly to a concentration about two thirds that in plasma Meanwhile, however, the thyroid and kidneys are removing about 20% and 3% respectively of the iodide in the blood passing through them, so that the thyroid clears an average of 25 ml and the kidneys 32 ml, of plasma of its content of iodide per minute The iodide so concentrated in the thyroid gland remains there for a matter of weeks, passing thence into the circulation, where it remains as thyroxine probably for several days before being removed by the tissues On its liberation as iodide into the circulation, it has a 40% chance of escaping removal by the kidney and repeating the cycle

In typical Graves's disease the uptake of iodide is accelerated about tenfold, and the stay in the thyroid may be reduced to one of a few days only The stay in the plasma as thyroxine averages 2 days, and 90% of the iodide released from the tissues is likely to re enter the cycle

Now it is clear that, in a normal subject, a high dietary iodine intake will not in general cause an increase in thyroxine metabolism It is therefore of physiological interest to find at which of the many stages of the iodine cycle the necessary control of thyroxine synthesis is exerted In the presence of a high dietary iodide is absorption decreased, or the thyroid clearance of iodide reduced, or the renal clearance augmented? Is the discharge from the thyroid delayed or reduced in rate, or does thyroxine represent a smaller proportion than usual of the discharged iodine? Or is thyroxine more slowly removed from the blood stream and utilised in the tissues? Some evidence on this problem is accumulating, notably from observations by Stanley (1949) and by Keating and Albert (1949) on the maximum rate at which the human thyroid can take up iodide When the speed of each step can be separately assessed, however, it should be possible to estimate at which stages control is exerted physiologically

This same type of analysis may also be of interest if we can identify which stages are influenced, and by

Fig 14—Contours indicating low activity (maximum 750 counts per minute) over carcinomatous right lobe and high counts (maximum 3250 counts per minute) over normal left lobe.

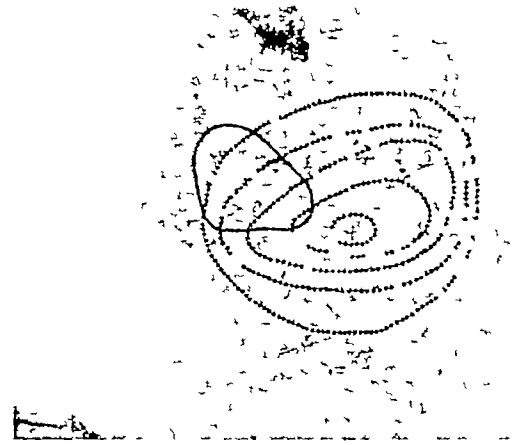


Fig 15—Contours grouped round position of normal thyroid tissue as uninfluenced by presence of carcinomatous mass in right lobe.

how much, in Graves's disease It should then be possible to examine whether the same stages are affected in the same proportion, for example, by the thyrotropic hormone of the pituitary If it were found that several steps in the iodine cycle were independent and were increased in Graves's disease, and that the appropriate dose of pituitary hormone increased all the same steps in the same ratios, this would give some presumptive evidence that the pituitary might be responsible for the changes observed in this condition If, on the other hand, the pituitary were found to produce some but not all of the changes, or to influence different steps in proportions different from those by which they are affected in Graves's disease, this could be taken as evidence that the pituitary alone was not responsible for all the changes observed And it is not *too much* to hope that a detailed analysis of the iodine cycle may throw useful light on the causation of this elusive disease

Localisation of Radio-Iodine

Hitherto we have discussed mainly the circulation of radio iodine through the body at various times after its administration As is well known, however, its distribution in different parts of the body can also be directly examined by external counting methods, which may yield information of value in both physiological and clinical work The general distribution of radio iodine in the neck and trunk, for example, may be studied by making a series of measurements with a counter near the anterior midline of the body but at different distances down the midline The distribution throughout the body may then be represented graphically by plotting each counting rate so observed against the corresponding distance from, for example, the cricoid cartilage Such a "profile" of iodine distribution is given in fig 10 which depicts findings one day after an oral dose in a normal subject, with the counter at 10 cm from the anterior midline of the body and receiving radiation through a vertical angle of 90° Localisation by this method, although sensitive, is inexact, and the effect of the thyroid is obvious at many centimetres from its position in the neck The rise in counting rate over the lower abdomen is commonly seen during the first few days after the dose and may be ascribed to concentration of radio iodine in urine within the bladder The smaller rise shown at the umbilical level is probably due to a similar renal concentration

In normal subjects the distribution during the ensuing week shows only a high peak opposite the thyroid, falling to low levels over the trunk without evidence of other areas of high concentration In several thyrotoxic subjects, however, in whom the distribution has been

examined, considerable local concentration develops in the region of the liver (fig 11) by the second or third day, as the plasma thyroxine reaches its highest values, and this peak is conspicuous in cases with high plasma thyroxine concentration Its maximum is at about the level of the ensiform cartilage and is greater to the right than to the left of the midline, and the data obtained appear to be consistent with the local concentration of thyroxine in the liver which has been postulated on other evidence derived from animal experiment (Gross and Leblond 1947) The maximum counting rate observed in this region is only a small percentage of that opposite the thyroid (fig 11), and is too low to allow the limits of the region to be accurately mapped by highly shielded directional counters In one case it has been shown by cholecystography that the area of high counts does not correspond with the position of the gall bladder We have observed a similar distribution in the hepatic region after the intravenous administration of synthetic radioactive thyroxine (Myant and Pochin 1950)

Another application of this relatively simple method of examining the body iodine distribution will be illustrated below in a patient with thyroid carcinoma In most cases of clinical importance, however, it is desirable to localise iodine-concentrating tissue with greater precision Counters used for this purpose are shielded with lead so that they respond only, or chiefly, to radio iodine below the skin at the site of measurement, the lead excluding radiations except from a narrow pencil of tissue near the axis of the counter Such shielding can be designed to give accurate localisation, although at the expense of sensitivity A series of readings can be obtained for example, at different points in the neck, indicating the distribution of radio iodine below the skin at these points The counting rates observed are marked in fig 12 at the corresponding points on the neck of a patient with left sided thyroid carcinoma This forms a chart of the distribution of radio iodine in the neck, which is more readily interpreted if contours are interpolated between the sites of measurement, corresponding to zones of equal radio iodine concentration The position of such contours may then be compared with that of the structures locally palpable (fig 13) In this case, a hard and evidently carcinomatous

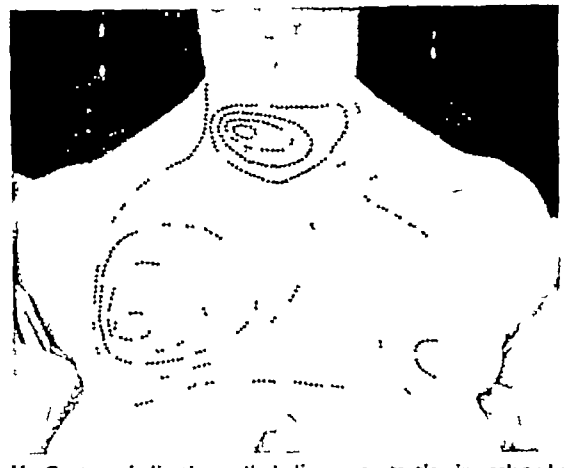


Fig 16—Contours indicating radio-iodine concentration in neck and over sites of lung metastases in chest.

mass had developed first and mainly in the left lobe of the thyroid with left sided pain As is shown in fig 13, most at least of the iodine concentrating power of the affected lobe had been destroyed, that of the left lobe being preserved This is unfortunately the commoner type of thyroid neoplasm, in which the carcinomatous tissue is too anaplastic to have preserved the capacity of concentrating iodine, at least in a degree which would make immediate treatment with radio iodine valuable Cases of this type are illustrated in figs 14 and 15 In the former, a hard carcinomatous mass involved the right lobe, which was shown by this method to take up iodine only weakly, as compared with the active, and presumably more normal, left lobe In fig 15, the pattern of radio iodine distribution is clearly uninfluenced by the presence of the carcinomatous mass in the right lobe, over which the contours are not deviated. In some of these, and in several other cases of thyroid carcinoma, metastases remote from the thyroid were examined by the same method and not found to take up detectable amounts of radio iodine In a small proportion of cases of thyroid carcinoma, however, particu-

Fig 17A

Fig 17B

Fig 17—Comparison between position of lung metastases and counting-rate contours (dotted lines).

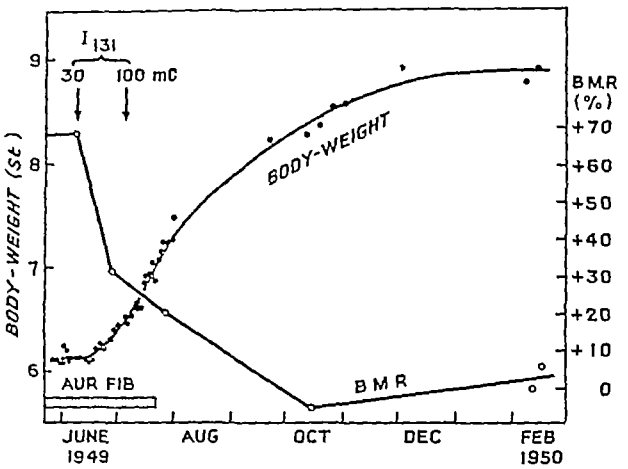


Fig 18—Response of body weight basal metabolic rate and heart rhythm to therapeutic doses of radio iodine in case of functioning thyroid carcinoma

larly those of slow growth and adenocarcinomatous structure, the tumour retains the iodine concentrating power of the original thyroid tissue In these cases, radio iodine can be immediately used in therapy, even though generalised carcinomatosis has developed, since if all metastases throughout the body concentrate iodine, they will concentrate radio iodine and so can be selectively irradiated by the beta radiations from a large dose of this material

A patient of this type had had a partial thyroidectomy for thyrotoxicosis in 1942 and was found to have a highly differentiated thyroid neoplasm with multiple secondaries in the lungs After operation, her thyrotoxicosis recurred and her metastases slowly grew, and it became clear that she had the rare type of thyroid carcinoma in which the mere mass of functioning thyroid like tissue was sufficient to produce a clinical state of thyrotoxicosis In May, 1949, she was weak, wasted, and severely dyspnœic, her body weight being 6 st 1 lb , and she had cardiac enlargement, auricular fibrillation, and a basal metabolic rate raised by 69% Multiple nodules, which proved to be carcinomatous, had recurred in the scar

Of a tracer dose of radio iodine about one sixth was concentrated in the neck, one quarter was excreted, and over a half was accumulated in the lung area, the contours (fig 16) indicating selective concentration in the neck and in those areas where metastases were known to be present Examined in more detail (fig 17) and with directional counts over the back of the chest, the areas of high contours of radioactivity corresponded closely with the areas containing many or large metastases shown radiologically

This patient was therefore given radio iodine in therapeutic dosage—that is, in amounts over one thousand times as large as those ordinarily used for tracer investigation The metabolic rate fell (fig 18), the heart reverted to normal rhythm in 6 weeks, and her body weight started to rise rapidly within 10 days of the first dose, and increased by 3 st to its previous normal value within 6 months The thyroid and tumour tissue had received a total of about 15,000 röntgens, and the total amounts of radiation received by the body amounted to 3 and 7 megagramme röntgens which produced no clear symptoms of radiation sickness, but depressed the blood lymphocyte count moderately after each dose The response of the lung metastases is shown in fig 19, and measurements indicate that the metastases shrank to one fifth of their previous volume Further evidence of this destructive effect of the radio iodine radiations

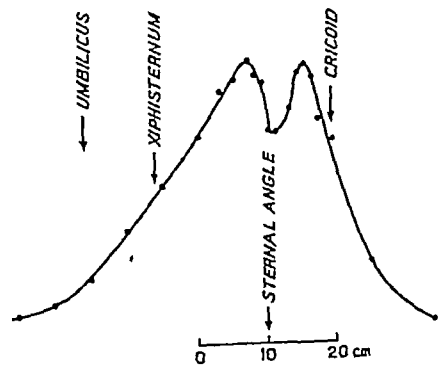


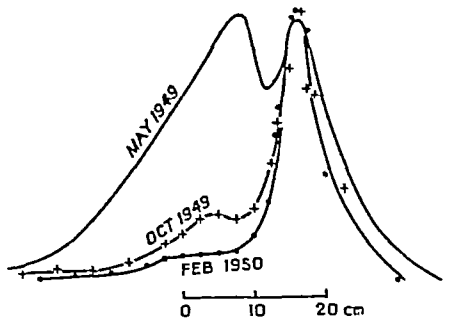
Fig 20— Profile of body radio-iodine distribution before treatment, with concentration in lung and thyroid areas

on the lung metastases was obtained from the "profile" diagram of body iodine distribution, that before treatment showing (fig 20) high peaks of concentration opposite the thyroid and also opposite the lung fields in which metastases were present After radio iodine therapy, further "profiles" were obtained 3 and 7 months later (fig 21) The radio iodine appeared in this case to have had a greater effect on the secondary neoplastic tissue in the lungs than on the normal thyroid or perhaps the primary neoplasm in the neck, so that the peak opposite the lungs was greatly reduced Biopsy,

(A)

(B)

Fig 19—Comparison between lung metastases (A) before and (B) after radio-iodine treatment.



ig 21— Profiles" of radio-iodine distribution before (May) and after (October and February) treatment which largely abolished concentrating metastases in lungs

ıowever, showed persisting carcinoma cells in a neck nodule, ınd local counting over the chest revealed that lung metastases vere still present and concentrated iodine All identified odine-concentrating tissue in the neck was therefore removed surgically, to confine the effect of further radio iodine doses to the lung metastases without competition by actively concentrating tissue in the neck

Such treatment, even though at present palliative rather than curative, is clearly valuable for thyroid carcinomata which concentrate iodine, and several cases (Seidlin et al 1949) have been maintained in full health for over 5 years by this means

It is evidently important that the iodine concentrating capacity of thyroid carcinomata should be investigated wherever possible This will be possible if there are metastases remote from the gland, over which the counting-rate can be measured without interference by adjacent thyroid tissue It will also be possible after total resection of the thyroid gland, and this operation, if practicable, is in any case a desirable preliminary to radio iodine therapy In cases with local extension only in the neck, it will rarely be practicable to distinguish radio iodine uptake in tumour tissue from that in adjacent or underlying thyroid tissue At best it may be shown that radio iodine is not taken up strongly, but weak uptake can never be excluded, nor the possibility of improved uptake after thyroidectomy The choice of treatment for such patients is difficult and they form the majority of cases of thyroid carcinoma Certain investigators consider that in all cases the thyroid should be removed surgically or destroyed with radio iodine, and the tumour investigated subsequently so that radio-iodine may be given in treatment if its uptake can be demonstrated (Seidlin et al 1949) It is at least desirable that radio iodine treatment should be considered for thyroid carcinomata with several years' history of slow growth, or in those shown on biopsy to be highly differentiated in histological structure with colloid formation, that radio iodine uptake should be examined where metastases are remote from the thyroid or where a thyroidectomy has been performed, that biopsy material should be examined for radioactivity where uptake appears likely but cannot be otherwise demonstrated and that where such uptake is demonstrated or strongly suspected, radio iodine treatment should be given in high initial dosage

This discussion has been confined to certain uses of one radio element only, and has dealt entirely with human applications In many other problems of thyroid function, and in work unconnected with the gland radio iodine has already been of great value The extensive clinical and other applications of radiosodium, radio phosphorus, and increasingly of radio iron are already familiar, while the radioactive forms of many other elements of biological importance and of their colloidal forms have been or are being used widely in research I would stress particularly the advantages in clinical investigation of obtaining by the use of these radio active isotopes a direct sample of the metabolism of the actual elements concerned, without disturbing the function that is being observed They offer a wealth of procedures simply and safely applicable to man, provided that the hazards, particularly of large doses and long lived isotopes, are strictly controlled Yet, for all their scope and future promise, the tracer techniques remain a method of study and not a study in themselves, just as, for example, the microscope is a research tool and not a research problem Like it, they will be the main tool in some problems, and a subsidiary one in many problems Their value will be fully realised when they are used alongside other and older methods of investigation and when their employment does not dominate, but is subordinated to, the plan of scientific inquiry So used, they are likely to have a power and a versatility shared by few comparable methods of research

SUMMARY

The circulation of iodine through the body may be examined quantitatively using radioactive iodine, and the duration of various stages of the iodine cycle compared in Graves's disease and in health

Normally, iodide injected intravenously is distributed within 2 hours through 40% of the body weight, whence it is removed by thyroid or kidneys after a mean time of 6–8 hours It then remains for many weeks in the thyroid, and for a few days as circulating thyroxine before re entering the cycle (fig 8) or being excreted by the kidney

In Graves's disease, the mean stay as iodide is 1–2 hours, that in the thyroid averages 5 days and may be less than 1 day, and 2 days are spent in circulation as thyroxine Most of the iodine liberated from the tissues probably re-enters this cycle

The thyroid's avidity for iodide may be measured by the rate at which it clears plasma of radio iodide In Graves's disease this thyroid clearance rate is usually raised from a normal average of 25 ml. per minute to over 100 ml per minute

Iodine is at first found to be concentrated in the thyroid, in the bladder and kidneys (fig 10), and in gastric and salivary secretions In thyrotoxic patients, after a few days some localisation may occur in the liver area (fig 11), presumably from thyroxine concentration

The distribution of radio iodine may indicate whether a thyroid carcinoma itself concentrates iodine (fig 17) or replaces iodine concentrating thyroid tissue (fig 14)

The treatment of iodine concentrating carcinoma with radio iodine is illustrated in figs 18 and 19

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DOMICILIARY TREATMENT OF PULMONARY TUBERCULOSIS WITH SODIUM PARA-AMINOSALICYLATE

DAVID L PUGH
M R C S
CHEST PHYSICIAN, MID KENT AREA, S E METROPOLITAN REGION, AT THE CHEST CLINIC, MAIDSTONE

E R JONES
M D, D P H Lpool, Ph D, B Sc Wales, F R I C
CONSULTANT PATHOLOGIST, S E METROPOLITAN REGION, AT KENT COUNTY LABORATORY, MAIDSTONE

With the aid of

W J MARTIN
D Sc, Ph D Lond
OF THE MEDICAL RESEARCH COUNCIL'S STATISTICAL RESEARCH UNIT, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

THE long waiting period before patients with pulmonary tuberculosis can be admitted to hospital or sanatorium *has produced remedial, preventive, and economic* problems for the chest physicians responsible for their domiciliary care In view of the worsening in their condition that often occurs during this wait, induction of artificial pneumothorax in the patient's home has been advocated, and evidence has been published to show that this procedure is justified and free from major risk Thus Pritchard (1948), Toussaint (1948), and Heller (1949) have adopted it as routine treatment in suitable cases, and Hoffstaedt (1949) advocates "early ambulatory collapse treatment after the induction of collapse in sanatorium or hospital, so that the magic circle which separates" so many patients "from timely treatment will be broken"

It may be comparatively simple to carry out an effective scheme of domiciliary collapse therapy in large cities, but it is more difficult to operate such a plan in areas which are partly urban and partly rural, and the possible complications are so hazardous that we have sought for other means of domiciliary treatment The need for frequent injections is a serious obstacle to the administration of streptomycin in the home, but sodium *p* aminosalicylate (sodium P A S), which is effective by mouth and free from major side effects, is more suitable for domiciliary use

PLAN OF INVESTIGATION

We report here our experience with 50 cases of pulmonary tuberculosis treated at home with sodium P A S ('Paramisan Sodium') since October, 1948 The patients were classified into four groups, AB, C, D, and E, according to the type of lesion present at the start of the trial, as in table I

The results obtained were related to the type of lesion, the existence of complications and their treatment, the production of resistant strains of tubercle bacillus, and the possible retrogression of the lesion on cessation of treatment

TABLE I—INITIAL CLASSIFICATION OF TREATED AND CONTROL PATIENTS

Groups	Treated with P A S		Total	Controls
	Twelve week course	Six week course		
AB Early exudative	5	7	12	33
C Chronic exudative	9	7	16	25
D Chronic exudative before collapse therapy	8	7	15	37
E Retrogressing lesion during collapse therapy	1	6	7*	11
Total	23	27	50	106

* Of these 7 patients 2 were being treated with pneumoperitoneum and 5 with artificial pneumothorax (including 1 bilateral)

The aim was to compare the progress of the 50 patients treated with sodium P A S with that of 106 controls obtained from among patients attending the clinic for some years before September, 1948, and selected so as to be roughly similar to the treated patients in age and sex, type and extent of lesion, mode of (non chemotherapeutic) treatment, and economic and domestic conditions

Each patient's present, past, and family history were recorded, together with the general condition, weight, and physical signs Investigations included erythrocyte sedimentation rate (E S R), blood-counts, culture of sputum, and radiography In old cases, the past history of the tuberculous lesion and the records of former treatment were also reviewed

Radiologically, all the treated and control cases conformed to the definition of their group, but within these limits there were some variations Thus the films of the treated patients in group C showed fairly extensive disease with cavitation in most cases, whereas none of the controls in group C had any cavities

At the end of six weeks each patient in the *sodium* P A S series was conveyed to the clinic for a complete assessment, and in the 23 cases where the treatment was continued for a further six weeks this was followed by another complete assessment The controls were assessed again twelve weeks after the date when they had shown signs comparable to those found initially in the treated cases Patients in the sodium P A S series were kept at rest in bed during the trial, being allowed up only for toilet The controls had been kept at rest in bed for twelve weeks In both series patients in group E were brought to the clinic for collapse therapy refills

DOSAGE

The sodium P A S was given six times a day, at 9 A M, 11 30 A M, 2 P M, 4 30 P M, 7 P M, and 9 30 P M The daily dosage was 18 g and each 3 g dose was given in a mixture as follows

Paramisan sodium	3 g
Syrup of orange	minims 30
Emulsion of chloroform (*B P C*)	minims 5
Water to	1 oz.

Tablets, each containing 0 33 g of paramisan sodium were tried in 6 cases This involved giving 9 tablets as a dose, and a total of 54 tablets each day Most patients preferred the mixture, so the tablets were abandoned.

If a patient complained of nausea, an alkaline mixture was prescribed When vomiting and diarrhœa occurred, the dosage of sodium P A S was reduced temporarily to half or a quarter and the patient was given either a 50 mg capsule of 'Benadryl' twice daily or one of the following mixtures three times a day

(1) Prepared chalk	gr 10
Tincture of opium	minims 8
Tincture of catechu	minims 5
Peppermint water	minims 60
Water to	½ oz.
(2) Syrup of tolu	minims 20
Dilute hydrocyanic acid	minims 2
Solution of morphine hydrochloride	minims 10
Chloroform water to	½ oz.

Acquired idiosyncrasy, which developed in one patient, was treated by withholding sodium P A S altogether for forty eight hours and then gradually increasing the four hourly dose over twelve days from 0 25 g to the full 3 g

It was not found necessary to give potassium citrate to render the urine alkaline, for no cases developed any renal disturbance No patient in this series had hæmoptysis, so it was not thought necessary to prescribe vitamin K, but all the patients received 1 mg of vitamin B_1 daily as a routine

TABLE II—GENERAL CONDITION AND ERYTHROCYTE SEDIMENTATION RATE AT START OF PERIOD OF OBSERVATION

—	General Condition												Erythrocyte-sedimentation rate (mm in 1st hour)											
Group	Twelve week course				Six week course				Controls				Twelve week course				Six week course				Controls			
	Good	Fair	Poor	Total	Good	Fair	Poor	Total	Good	Fair	Poor	Total	0–20	21–50	50 +	Total	0–20	21–50	50 +	Total	0–20	21–50	50 +	Total
AB	3	0	2	5	2	5	0	7	14	15	4	33	2	3	0	5	4	3	0	7	22	5	1	28
C	0	3	6	9	0	4	3	7	5	12	8	25	2	4	3	9	1	3	3	7	9	7	1	17
D	0	5	3	8	1	4	2	7	6	11	20	37	1	5	2	8	1	3	3	7	9	8	8	25
E	0	0	1	1	0	3	3	6	0	1	10	11	0	1	0	1	1	4	1	6	1	4	6	11
Totals	3	8	12	23	3	16	8	27	25	39	42	106	5	13	5	23	7	13	7	27	41	24	16	81

Blood levels

The blood P A S levels were estimated weekly by one of us (E R J) by the method described by Herts Pharmaceuticals Ltd , with slight modifications This method depends on the production of a yellow green colour by the addition of Ehrlich's reagent to solutions of P A S or sodium P.A S

The *p*-dimethylaminobenzaldehyde used for the Ehrlich's reagent was purified from alcohol and water All determinations were made with a 'Spekker' absorptiometer by using solutions containing 20, 10, 5, and 2 5 mg of sodium P.A S per 100 ml to produce the calibration curve and treating these solutions in the same manner as specimens of blood The calibration curve for the dilution of sodium P.A.S used is a straight line All readings in the Spekker absorptiometer were made against blanks in which distilled water treated similarly took the place of blood Most samples of blood give a slight colour with Ehrlich's reagent, and a "blank" was estimated on every patient before the start of treatment and after its completion The "blank varied from the equivalent of 0 to 1 2 mg of P.A S per 100 ml , and the value found has been subtracted from the P.A.S levels found during treatment

Other Measures

A full blood-count was made before and after the course

PLANNED COMBINED OPERATION

Before the course of sodium P A S was started a "combined operation" of the various possible methods of treatment was planned. The following is an example

(1) Rest in bed, with ancillary nourishment and attention to economic needs

(2) Recommendation for admission to a suitable hospital for one or more of the following (*a*) continuation of rest in bed , (*b*) sanatorium régime , (*c*) artificial pneumothorax , (*d*) pneumoperitoneum with or without phrenic crush , (*e*) thoracoplasty or other surgical procedure , and (*f*) chemotherapy

(3) The course of sodium P.A.S was then started for six weeks in the first instance, and subsequently extended to twelve weeks in 23 cases

(4) Any modification of (2) was then considered and the necessary action taken.

Further assessments of the condition of the lesions after the course of treatment are planned and will be reported on later If the lesions are found to be retrogressing, a decision will be taken about continuation of sodium P A S therapy or the institution of an alternative form of treatment

INITIAL CONDITION

Table II shows the general condition and E S R of treated and control patients in the four groups at the start of the period of observation

It will be seen that the proportion of patients with good general condition was twice as large in the controls as in the combined groups of patients treated with sodium P A S The controls had proportionately fewer in the fair category, whereas the percentages in poor condition were the same in the two series

A similar advantage was shown by the controls in their E S.R , their proportion of cases with a rate of 0–20 mm in 1 hr was twice as high as in the treated patients The proportions in the 50+ group was similar in the two series whereas cases with intermediate rates (21–50 mm in 1 hr) were more numerous in the treated series

RESULTS AT END OF PERIOD

Each patient's condition was assessed on radiological appearances, general condition, weight, E S R , and amount of sputum and its bacillary content The radiogram is the most important single factor to consider, and in most cases the clinical and radiological changes follow similar trends It will be seen from table III that there was radiological improvement in 18 (78 3%) of the 23 patients treated for twelve weeks and 20 (74 1%) of the 27 treated for six weeks, whereas of the 106 controls, 38 (35 8%) showed improvement, 45 (42 5%) no change, and 23 (21 7%) deterioration

Table III also shows that the patients with cavities at the start of treatment were more numerous in the treated series than in the controls—i e , 43 of the 50 treated patients as against 47 of the 106 controls

Of the patients with cavities the proportion showing improvement was about four times as large in the treated series as in the controls—i e , 15 of the 20 patients treated for twelve weeks and 17 of the 23 treated for six weeks as against 10 of the 47 controls

TABLE III—RADIOLOGICAL RESULTS RELATED TO PRESENCE OF CAVITATION AT START OF PERIOD OF OBSERVATION

Group	Twelve week course				Six week course				Controls			
	Improved	No change	Worse	Total	Improved	No change	Worse	Total	Improved	No change	Worse	Total
With cavities												
AB	2	0	1	3	4	0	0	4	1	2	0	3
C	6	1	1	8	3	3	1	7	0	0	0	0
D	7	1	0	8	7	0	0	7	7	23	7	37
E	0	1	0	1	3	2	0	5	2	1	4	7
Total	15	3	2	20	17	5	1	23	10	26	11	47
Without cavities												
AB	2	0	0	2	2	0	1	3	16	11	3	30
C	1	0	0	1	0	0	0	0	11	7	7	25
D	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	1	0	0	1	1	1	2	4
Total	3	0	0	3	3	0	1	4	28	19	12	59
Grand total	18	3	2	23	20	5	2	27	38	45	23	106

TABLE IV—ERYTHROCYTE SEDIMENTATION RATES AT START AND AT END OF PERIOD

Group	E.S.R. (mm. in 1 hr.)	Initial	After twelve week course	After six week course	Controls*	
					Before	After
AB	0–20	6	3	7	22	19
	21–50	6	1	0	5	2
	50 +	0	1	0	1	1
	Total	12	5	7	28	22
C	0–20	3	4	1	9	11
	21–50	8	1	1	7	6
	50 +	5	4	5	1	0
	Total	16	9	7	17	17
D	0–20	2	4	4	9	16
	21–50	9	3	2	8	4
	50 +	4	1	1	8	6
	Total	15	8	7	25	26
E	0–20	1	0	2	1	3
	21–50	5	0	3	4	1
	50 +	1	1	1	6	7
	Total	7	1	6	11	11
All groups	0–20	12	11	14	41	49
	21–50	28	5	6	24	13
	50 +	10	7	7	16	14
	Total	50	23	27	81	76

* The E.S.R. was not recorded in controls as follows

Group	Before	After
AB	5	11
C	8	8
D	12	11
E	0	0
Total	25	30

Of the patients without cavities 3 out of 3 treated for twelve weeks and 3 out of 4 treated for six weeks showed improvement as against 28 of the 59 controls

Erythrocyte sedimentation Rate

In table IV it will be seen that the E.S.R. (Westergren) showed the same trend as the radiological findings Most of the patients to be treated with P.A.S. had a reading of 21–50 mm. in 1 hr before the course On the completion of treatment patients on both the twelve week and the six week courses showed a reduction in the reading, most of them now being 0–20 mm. in 1 hr Most of the controls had an initial reading of 0–20 mm in 1 hr., a condition that remained unchanged after three months' rest in bed

Body weight

Table V shows that a good proportion of patients with pulmonary tuberculosis gain weight when the only treatment is rest in bed. In groups AB, C, and D of the controls most of the patients gained up to 13 lb Only a small percentage of them lost weight Among the treated patients this trend was not so well marked, but the figures for the twelve week course show that there was a tendency to gain weight in all the groups despite the digestive disturbance that most patients showed in the early days of treatment Data for the six week course, however, reveal a loss of weight in 14 of the patients in all the groups, there being an increase in weight in 13 patients The preponderance is therefore towards a gain in weight in the patients treated with P.A.S. as well as in the controls

Toxæmia

Before the start of treatment with sodium P.A.S., 20 of the 50 patients showed severe, and 23 moderate, toxæmia Most patients on both the twelve week and the six week courses showed a distinct reduction in toxæmia, greater than in the corresponding control groups (table VI)

Sputum

Table VII shows that at the start of treatment the sputum of most of the patients in all groups of the treated series contained tubercle bacilli. At the end of both the six week and the twelve week courses the number of patients with positive sputum had fallen considerably and there was an increase in the number with no sputum

Among the controls, though such changes were not so well marked, the tendency was to the absence of sputum or to sputum conversion Sputum conversion occurred in the four groups as follows

Group	Twelve week course	Six week course	Controls
AB	1	1	3
C	1	0	2
D	0	2	5
E	0	1	3

The sputum conversion in patients treated with sodium P.A.S. confirms the statements of Vallentin (1946), Steinlin and Wilhelmi (1948), and Paraf et al (1948), all of whom have reported this reaction in some of their cases.

Morphological changes in the bacillus have been described by Nagley and Logg (1949), Dempsey and Logg (1947), and Erdei (1948) These include granulation with beading and occasional striation The granules were acid-fast, and these bacilli could not be grown on either Dubos or solid media Davis (1948) confirms this, saying that a concentration of 0.2–0.4 mg. per 100 ml. of Dubos medium inhibits the growth of tubercle bacilli from an inoculum of the H37 strain Erdei (1948) also affirms that after three weeks' treatment cultures of the sputum showed no growth in six weeks

The microscopical characters of tubercle bacilli found in the sputum of patients being treated with sodium P.A.S. vary considerably In some the organisms exhibit little change in morphology, but in most cases atypical forms predominate In the latter, clumping of the bacilli is very striking, beaded forms are numerous, and some show uneven staining Short thick forms may be

TABLE V—CHANGES IN WEIGHT DURING PERIOD

Group	Change in weight (lb.)	Twelve week course	Six week course	Controls (twelve weeks)
AB	+14 or more	2	0	4
	+5–13	1	2	11
	+0–4	0	0	14
	Loss	2	5	0
	Total	5	7	29
C	+14 or more	0	1	4
	+5–13	1	2	6
	+0–4	4	0	8
	Loss	4	4	3
	Total	9	7	21
D	+14 or more	3	1	5
	+5–13	2	1	12
	+0–4	1	2	6
	Loss	2	3	3
	Total	8	7	26
E	+14 or more	0	0	0
	+5–13	0	2	2
	+0–4	1	2	2
	Loss	0	2	1
	Total	1	6	5
Total	+14 or more	5	2	13
	+5–13	4	7	31
	+0–4	6	4	30
	Loss	8	14	7
	Total	23	27	81

Weight not recorded in controls as follows

AB	4
C	4
D	11
E	6
Total	25

TABLE VI—TOXÆMIA BEFORE AND AFTER PERIOD

Group	Toxæmia	At start of treatment	After twelve week course	After six week course	Controls (twelve weeks)	
					Before	After
B	Nil	5	3	4	23	29
	Moderate	4	2	3	9	3
	Severe	3	0	0	1	1
	Total	12	5	7	33	33
C	Nil	0	2	1	16	19
	Moderate	9	6	6	8	5
	Severe	7	1	0	1	1
	Total	16	9	7	25	25
D	Nil	2	4	4	18	19
	Moderate	8	4	2	14	14
	Severe	5	0	1	5	4
	Total	15	8	7	37	37
E	Nil	0	0	0	1	2
	Moderate	2	1	6	7	6
	Severe	5	0	0	3	3
	Total	7	1	6	11	11
Total	Nil	7	9	9	58	69
	Moderate	23	13	17	38	28
	Severe	20	1	1	10	9
	Total	50	23	27	106	106

found, and some bacilli present swellings, particularly at the ends, in which the acid fast substances stain very deeply with Ziehl-Neelsen, mycelial threads, the length of 10–12 organisms, have been observed, but definite branching is not a conspicuous feature

SENSITIVITY OF TUBERCLE BACILLI TO SODIUM P.A.S

A vital factor in the chemotherapy of tuberculosis is the tendency of tubercle bacilli to produce resistant strains during treatment Though Davis (1948), Erdei (1948), and Lehmann (1947) did not find resistant strains, Widström and Swedberg (1948), in Sweden, have shown that treatment with sodium P A S produces resistance in the tubercle bacilli in the same way as treatment with streptomycin produces resistance in tubercle bacilli against streptomycin, and they provide statistically reliable evidence of differences in behaviour of strains of tubercle bacilli according as the patients harbouring them have, or have not, been treated with sodium P.A S Graessle and Pietrowski (1949) have found that sodium P.A.S can be used in vitro to retard the development of streptomycin resistant strains

Experiments show that even in untreated cases the sensitivity of tubercle bacilli to P A S varies widely Delaude et al. (1949) found that cultures from 46 patients not treated with P A S and from 18 patients treated with P.A.S alone for 94 days or less, were resistant to only 0 006–0 012 mg of sodium P.A S per 100 ml of egg yolk-agar medium, and Youmans et al. (1947) state that 17 recently isolated strains of tubercle bacilli were inhibited in vitro by P A S in concentrations of 0 02–0 08 mg per 100 ml Fisher (1948) points out that the composition of the medium makes striking differences in the level at which growth is inhibited by streptomycin, but, though Hauduroy and Rosset (1948) suggest that this is not so for the media tried by them, there is reason to suppose that with P.A.S the composition of the medium may have an effect

To be of the greatest value to the clinician, the method of estimating the sensitivity of tubercle bacilli to any drug must be quick as well as reliable For sputa containing many organisms more or less evenly distributed throughout the specimen the slide microculture method of Pryce (1941), using human blood lysed with an equal volume of distilled water containing various amounts of sodium P A S solution as medium, will give results within a week or less But with sputum containing few organisms the results are not so reliable, for there is no guarantee that all the smears made from the sputum contain viable tubercle bacilli Concentrating the specimen and obtaining a homogeneous suspension of the bacilli by the caustic soda method or by Jungman's method did not give satisfactory results, with the slide technique, on hæmolysed blood with and without vitamin K, Dubos medium, blood containing Proskauer and Beck medium, and Proskauer and Beck medium alone, though positive cultures from the same specimens were obtained on Löwenstein's medium

The method now on trial is the inoculation of Löwenstein's medium, to which have been added various amounts of sodium P A S solution before inspissation, with specimens concentrated by the caustic soda method

In view of variations in the sensitivity of tubercle bacilli to P A S it is advisable to test their sensitivity in every patient before starting treatment, but owing to lack of a suitable method this was not done in the present cases

The results given below were obtained from tests made by smearing glass slides 3 × 1/2 in to within 1/2 in of the top of the slide with a loopful of the specimen and incubating at 37°C for 3–7 days in 1 oz screw capped bottles containing 8 ml. of the culture medium (equal parts of human blood and sterile distilled water containing sodium P A S solutions to give final concentrations of 10 0, 1 0, 0 5, 0 25, 0 1, 0 05, and 0 025 mg per 100 ml of culture fluid)

Thirty specimens of sputum from 28 patients under treatment with sodium P A S and controls from 3 tuberculous patients not receiving the drug were examined The specimens were stained and examined for tubercle bacilli before culturing The following results were obtained

Of the controls 2 grew no tubercle bacilli in the presence of sodium P.A.S 0 25 mg per 100 ml., but did so in the presence of 0 1 mg per 100 ml The third did not grow tubercle bacilli in the presence of sodium P.A.S 0 5 mg per 100 ml, but did so in the presence of 0 25 mg per 100 ml.

Of the 30 specimens of sputum from 28 patients treated with sodium P A.S, 17 did not show tubercle bacilli on staining 16 of these gave no growth in any dilutions of sodium P.A.S or on the control medium, and the remaining 1 grew tubercle bacilli both in sodium P.A S and in the control medium The 13 other specimens of sputum were proved by staining to contain tubercle bacilli, 3 of these gave no growth in any dilution of sodium P.A S, or on the control medium, whereas 10 gave a growth both in sodium P.A S and on the control medium Of the last-mentioned 10 specimens 1 showed growth in

TABLE VII—PRESENCE OF TUBERCLE BACILLI IN SPUTUM AT START AND AT END OF PERIOD

Group	Sputum	At start of treatment	After twelve week course	After six week course	Controls (twelve weeks)	
					Before	After
AB	Pos	5	1	0	7	5
	Neg	2	1	2	10	11
	Nil	5	3	5	16	17
	Total	12	5	7	33	33
C	Pos	11	4	3	20	18
	Neg	1	2	0	3	3
	Nil	4	3	4	2	4
	Total	16	9	7	25	25
D	Pos	14	3	4	22	13
	Neg	0	0	2	6	10
	Nil	1	5	1	9	14
	Total	15	8	7	37	37
E	Pos	4	1	3	8	5
	Neg	1	0	1	2	4
	Nil	2	0	2	1	2
	Total	7	1	6	11	11
Total	Pos	34	9	10	57	41
	Neg	4	3	5	21	28
	Nil	12	11	12	28	37
	Total	50	23	27	106	106

1 mg per 100 ml but no growth with 10 mg, 1 showed growth in 0 25 mg per 100 ml but no growth with 0 5 mg, 4 showed growth in 0 1 mg per 100 ml but no growth with 0 25 mg, 1 showed growth in 0 05 mg per 100 ml but no growth with 0 1 mg, 3 showed growth in 0 025 mg per 100 ml but no growth with 0 05 mg

These findings support the view that there is normally a great variation in the sensitivity of tubercle bacilli to sodium P A S

COMPLICATIONS OR SIDE EFFECTS

Salicylism

Lehmann (1946) has stated that none of the usual effects of salicylates (sweats and tinnitus) were observed in any of his cases, and apart from transient headaches in 2 cases these symptoms have not occurred in the present series

Hæmaturia and Albuminuria

Hæmaturia was not seen in the present cases, but albuminuria was found in 1 case Both hæmaturia and albuminuria occurred in 4 of the 37 cases reported by Nagley and Logg (1949) Albuminuria was found in 1 case by Hemming and Stewart (1949), who believe that, though the kidney tissues were not irreparably damaged by P A S, the glomeruli were affected in some way allowing increased filtration of proteins These workers therefore advocate that P A S should not be given when "there is evidence of generalised disease of the nephrons" Albuminuria has also been reported by Vallentin (1946) and Alin and Difs (1947)

Normoglycæmic Glycosuria

Zarafonetis et al (1948) found glucose in the urine of patients treated with *p* aminobenzoic acid, and Kelemen and Halmágyi (1949) found glucose in the urine of patients treated with sodium P A S The latter workers report that during the excretion of the glucose kidney alkaline phosphatase activity was significantly enhanced, and on the basis of their experiments conclude that sodium P A S gives rise to normoglycæmic glycosuria in some cases, and to an unknown metabolite in the urine in others

Hypoprothrombinæmia

Swanson (1949), who used P A S in rheumatoid arthritis, reports that 5 out of 6 patients developed hypoprothrombinæmia, but not enough to cause hæmorrhage This may explain the frank hæmaturia reported by Nagley and Logg (1949), but the hæmaturia may be due to the deposit of crystals in the urinary tract This condition cleared on alkalinisation of the urine, and O'Connor (1949) suggests the prophylactic administration of vitamin K, which suggestion is supported by the fact that Link et al. (1943) found hæmorrhages and hypoprothrombinæmia in rats when the diet was deficient in vitamin K Erdei and Snell (1948) affirm that the excretion of ascorbic acid is greatly increased by salicylates, and advocates repeated checks on the blood-prothrombin levels and ascorbic acid excretion rate

In the present series there has been no evidence of hæmaturia, and no patient had hæmoptysis or stained sputum during the course

Acquired Idiosyncrasy

Hemming and Stewart (1949), Horne (1949), and Joules and Nassau (1949) all report cases of acquired idiosyncrasy to freshly made sodium P A S The characteristic symptoms include malaise, anorexia, nausea, headache, intense photophobia with suffused conjunctivæ, fever, restlessness, an erythematous or morbilliform rash, itchiness of the skin, and a non productive cough These symptoms ceased when the drug was withdrawn, and benadryl 100 mg two or three times daily accelerated the relief No previous history suggesting allergy was obtained Desensitisation was obtained by giving benadryl and grading the dosage of sodium P A S

Idiosyncrasy was found in 1 patient in the present Four weeks after the start of treatment the patient dev a temperature of 101°F, with headache, sweats, and erythematous eruption on the trunk Sodium P.A.S discontinued for two days and then given again. T temperature again rose to 100°F, but fell again when drug was discontinued Treatment was resumed a week l beginning with a quarter of the dose three times daily T was increased by one dose daily until six doses were b taken The dose was next increased to half the norm dose six times daily, and, there being no further s on this dosage, a further increase to three quarters of t normal dose was made This also showed no ill effects, a the full dosage was resumed with no further s Benadryl 50 mg was also given twice daily for the first days and then discontinued

Another case of intolerance to sodium P.A.S occurred two weeks' treatment and produced a syndrome resemb scarlatina, with high temperature, sore throat, serous ot rhœa, labial herpes, and an erythematous eruption involv the whole of the body and causing complete desquamat of the skin The drug was discontinued immediately in th belief that the condition was scarlatina It is now believ that the patient had a streptococcal infection which produc a severe intolerance of salicylates It was impossible t renew treatment with P.A S, and this case is not included the present series

Gastro intestinal Upset

Symptoms of nausea, vomiting, and diarrhœa hav been described by Nagley and Logg (1949), Vallentin (1946), Alin and Difs (1947), Joules and Nassau (1949) Dempsey and Logg (1947), and Sivrière (1948), bu Erdei and Snell (1948) report no gastro intestina symptoms in their series

In the present series digestive disturbances occurre in 12 of the 23 patients in the twelve week course and i 14 of the 27 patients in the six week course The contro had no gastro intestinal upset It was not necessary i any treated case to discontinue the sodium P A S eve for a day owing to digestive disturbances In a few case the full dosage was reduced to half for one or two day until the symptoms had disappeared when full dosag was resumed In addition, one of the mixtures mentioned above or benadryl was prescribed, and to these forms o medication all the patients responded.

DISCUSSION

The results of this trial indicate that sodium P A S of definite value in certain types of pulmonary tuberc lous lesions, but it should be given with a "definite go in view" (Nagley and Logg 1949)

It has been established in this series of cases balance against controls with similar lesions and economic an domestic conditions that definite improvement may b obtained in the general condition, toxæmia, E.S.R sputum, radiological appearances, and, to a more limite extent, in the body-weight. Radiologically, the infi trative process is arrested, and in most cases the cavitie shrink The disappearance of infiltrations sometime shows that what appeared to be a single cavity in th original film is two or more cavities close together

Exudative tuberculous lesions, whether acute chronic, responded best, and there is evidence th longer administration of P A S would be of value supporting already existing collapse therapy not on by acting on the lesion in the partially collapsed lung b also by arresting secondary involvement of the other lun

There is no doubt also that sodium P A S is of immen value in preparing the patient for collapse therapy T improvement shown in the present series indicates th the drug is most efficacious in building up the patie for subsequent thoracoplasty, especially when there no delay in submitting the patient to operation T evidence also indicates that such premedication m also be of value in preparing patients for artifici pneumothorax, though perhaps caution should be exe cised in deciding the length of time that should elap

fore its induction Dr F Temple Clive (personal communication) has emphasised that, in the present state of our knowledge, the result of P A S therapy may possibly give a false picture of the patient's natural resistance, and that an artificial pneumothorax induced too soon after the course of treatment might be fraught with danger Erdei and Snell (1948) have stated that there is an exacerbation of chronic lesions after the end of the course but give no indication of the length of time that ensues before such a reactivation occurs

The experience of other workers in relation to complications arising during the course have not been shared in the present series Gastro intestinal upsets have formed the main difficulty, but these have readily responded to general treatment One patient gave a mild allergic response but made a rapid recovery, being desensitised by repeated small doses One other case of a severe intolerance occurred, but it has been impossible to include this history in the series, the patient being still under treatment

As a result of protracted laboratory investigation only one patient was found to have produced a resistant strain of tubercle bacillus This patient's sputum was positive at the start of the course, and at the end of the course there was no sputum A month later a positive sputum was found which was resistant to P.A S No other case showed production of a resistant strain Changes in the morphology of the tubercle bacillus have been found to be common, in agreement with the experience of other workers

Blood P A S levels were estimated weekly in the patients receiving sodium P A S, but owing to the making of domiciliary visits at different times the blood was taken at varying intervals after the previous dose of sodium P A S, which fact explains the low average levels in some cases Unless consideration is given to this time factor and the renal excretory rate, it is impossible to make a definite observation on the relationship between the average blood P A S level and the final result

SUMMARY

The domiciliary use of sodium P A S in the treatment of 50 patients with pulmonary tuberculosis is reviewed 23 patients received the treatment for twelve weeks and 27 for six weeks These cases were reviewed against 106 controls with similar lesions and economic conditions

Most of the patients in both series definitely improved, a fact which justified the continued use of sodium P A S as part of a planned combined operation

A resistant strain of tubercle bacillus developed in 1 case

The reactions of the tuberculous process after the end of sodium P A S treatment are being observed and will be reported later In this further survey the hæmatological findings before, at the end of, and three months after the end of the course of P A S will be reviewed

Our thanks are due to the members of the staffs of the Chest Clinic of the Mid Kent Area (Maidstone) and the Kent County Laboratory, and the pharmacist at the West Kent General Hospital, for their unfailing coöperation and assistance, without which this report could not have been produced

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A CASE OF BRILL'S DISEASE IN LONDON

J C HAWKSLEY
C.B E, M.D Lond, Ph.D Birm, F R C.P
PHYSICIAN

E JOAN STOKES
M.B Lond, M.R C.P
BACTERIOLOGIST

UNIVERSITY COLLEGE HOSPITAL

Brill's disease is a mild form of typhus fever that occurs sporadically among the immigrant populations of New York, Boston, and other coastal towns of the north eastern United States

NATURE OF DISEASE

Brill (1898, 1910) observed between 1896 and 1910, among the Jewish patients at the Mount Sinai Hospital in New York, over 200 cases of a disease which he differentiated from typhoid fever and the other febrile conditions common to the region The clinical suspicion that "Brill's disease" was a mild endemic form of typhus fever was confirmed by the experimental work of Anderson and Goldberger (1912) who showed that in monkeys the virus of Brill's disease and that of epidemic Mexican typhus (tabardillo) were identical, and similar in all respects to the virus of the classical louse borne typhus of Europe and North Africa When the Weil Felix reaction with *Proteus* OX19 was applied to cases of Brill's disease it was also found to be positive.

Extensive studies by Maxcy and Havens (1923) and Maxcy (1926a and b, 1928) revealed the occurrence throughout the southern and south-eastern United States of a disease which resembled typhus clinically, and gave a positive Weil Felix reaction with *Proteus* OX19, but was not transmitted by the louse The disease was referred to as endemic typhus of the United States, or Brill's disease, and Maxcy suspected on the basis of his epidemiological investigations that rats or mice were the most likely reservoirs of the infection Similar observations were made at about the same time in Australia (Hone 1922), in the Federated Malay States (Fletcher and Lesslar 1925) and in many other parts of the world

During 1928 and 1929 Mooser, working in Mexico City, demonstrated in a series of brilliant experiments that endemic Mexican typhus and Old World louse borne typhus could be distinguished by the different pathological effects the two infections produced in guineapigs and white rats (Mooser 1928, 1929) Almost immediately Maxcy (1929) was able to show that endemic typhus of the south eastern United States, which up to that time was still called Brill's disease, behaved in the same way as Mexican typhus Maxcy's conclusion that a reservoir of the infection might exist in rats or mice was soon amply corroborated Dyer et al. (1931) showed that the infection could be transmitted by the fleas of rats trapped in typhus foci in Baltimore, and Mooser, Castaneda, and Zinsser (1931) found that the virus was present in the brains of rats caught in Mexico City Murine typhus, due to *R mooseri*, is now known to have a world-wide distribution

Meanwhile the position of what had been originally called Brill's disease—namely the sporadic typhus cases

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DISCUSSION

The results of this trial indicate that sodium P A S is of definite value in certain types of pulmonary tuberculous lesions, but it should be given with a "definite goal in view" (Nagley and Logg 1949)

It has been established in this series of cases balanced against controls with similar lesions and economic and domestic conditions that definite improvement may be obtained in the general condition, toxæmia, E.S.R. sputum, radiological appearances, and, to a more limited extent, in the body weight. Radiologically, the infiltrative process is arrested, and in most cases the cavities shrink The disappearance of infiltrations sometimes shows that what appeared to be a single cavity in the original film is two or more cavities close together

Exudative tuberculous lesions, whether acute or chronic, responded best, and there is evidence that longer administration of P A S would be of value in supporting already existing collapse therapy not only by acting on the lesion in the partially collapsed lung but also by arresting secondary involvement of the other lung

There is no doubt also that sodium P A S is of immense value in preparing the patient for collapse therapy The improvement shown in the present series indicates that the drug is most efficacious in building up the patient for subsequent thoracoplasty, especially when there is no delay in submitting the patient to operation The evidence also indicates that such premedication may also be of value in preparing patients for artificial pneumothorax, though perhaps caution should be exercised in deciding the length of time that should elapse

rols of the suspensions were included in each test Having ained positive results with this method on the first two asions it was used throughout the investigation

The results of the Weil-Felix tests were not considered ogether satisfactory, and seven samples of serum were t to Dr A Felix for further investigation His dings of the agglutination tests are shown in table II, d his interpretation of the results was that the marked op in the OX19 titre was to be accepted as confirming e clinical diagnosis

Dr Felix also examined the sera for agglutinins against urine and louse borne rickettsiæ, but the suspensions his collection, which had been obtained from Dr J aigie, Toronto, nearly three years ago, proved to be ert He therefore sent five of the sera to Dr Joseph E madel, Department of Virus and Rickettsial Diseases, rmy Medical Center, Washington, for rickettsial gglutination and complement-fixation tests A report n them was received from Dr Ross L Gauld (table III) who interpreted the results as follows

"The reactions in this case are definitely epidemic in type and are consistent with a diagnosis of Brill's disease The final diagnosis, of course, must rest upon the epidemiological evidence It is the experience of this laboratory that the rickettsial agglutination generally becomes positive before the complement-fixation. We have no adequate explanation to offer for the delay in the appearance of a positive agglutination test in this case"

We are very grateful to Dr Felix, to Dr Smadel, and to Dr Gauld for their interest and help An accompanying paper by Dr Felix comments on the findings

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NOTE ON
A CASE OF BRILL'S DISEASE IN LONDON

A. FELIX
D Sc, F.R S
DIRECTOR, CENTRAL ENTERIC REFERENCE LABORATORY AND BUREAU, PUBLIC HEALTH LABORATORY SERVICE (MEDICAL RESEARCH COUNCIL), LONDON

THE identification in London of a case of Brill's disease, described in the accompanying paper by Hawksley and Stokes will interest clinician, epidemiologist, and laboratory worker alike So far as I am aware, only one case had previously been identified in a reliable manner outside the coastal towns of the north-eastern United States That single case occurred in 1945 in Zürich (Mooser and Löffler 1946) in an Armenian, aged 52, who arrived in Switzerland in 1939 and gave a history of having had severe typhus fever in South Russia in 1918 Mooser's wide experience of typhus fever may be accepted as a guarantee that the Zürich case was one of Brill's disease—i e, genuine recrudescence of louse borne typhus after an interval of many years (Zinsser 1934)

In Zinsser's (1934) statistical study of 538 cases of Brill's disease diagnosed in New York and Boston in the course of thirty years, over 90% of the patients were Jewish immigrants from eastern Europe There was, of course, no reason to assume that the incidence of the disease was limited to any racial group More recently 2 serologically proved cases of Brill's disease have been reported in Irish born residents of Boston (Morgan et al 1948) Both patients had been born in co Galway, Ireland, where outbreaks of louse borne typhus are known to have occurred up to quite recent times (McConn 1943), but both had lived in Boston for more than thirty years It is obvious that Brill's disease will occasionally be seen in any country whose population comprises an appreciable proportion of persons previously exposed to louse borne typhus This, of course, applies equally to countries that are endemic areas of louse borne typhus and to countries that receive immigrants from those areas

The clinical diagnosis of typhus is not altogether easy, and the most experienced physician may be unable to diagnose mild cases of the disease, even during an out break Naturally the difficulties of diagnosis are much greater in a country where the disease is unknown or very rare, and in Brill's disease they are further increased by the fact that the cases always occur sporadically, and that the clinical course is as a rule milder than in the primary attack of louse borne typhus This has been brought out vividly in a comprehensive study published a few weeks ago by a group of workers in New York and Boston (Murray et al 1950), some of whom command an unrivalled personal experience of the treatment of Brill's disease The patient now diagnosed in London failed to develop even a rash, the most helpful of the few diagnostic criteria, and the accuracy of the clinical diagnosis was in this case undoubtedly due to the fact that the attending physician had acquired considerable experience of typhus fever while serving with the Army in the Middle East

It is not surprising, therefore, that laboratory tests are indispensable in the diagnosis of cases of Brill's disease Since the war of 1939–45 agglutination and complement-fixation tests with rickettsial suspensions have become available, in addition to the old established tests with *Proteus* OX antigens The rickettsial tests have the great advantage of making it often possible to distinguish between those varieties of typhus which give overlapping reactions to the *Proteus* OX antigens and which, therefore, cannot be differentiated by the Weil-Felix test Rickettsial antigens are, however, rather delicate and expensive reagents, and their use is of necessity restricted to certain central institutes, the average routine laboratory must continue to rely on the simple agglutination test with *Proteus* OX antigens The present case of Brill's disease in London clearly showed that it was possible to confirm the clinical diagnosis by the use of the *Proteus* OX19 reaction Comparison of tables II and III in the accompanying paper also shows that in this particular case the OX19 reaction was positive earlier than the rickettsial agglutination test

Even the relatively simple agglutination test with *Proteus* OX antigens must, however, be carried out according to the proper technique, if reliable results are to be obtained The customary Dreyer's technique, still recommended in most textbooks, is unsuitable for this test, because of the heat lability of O agglutinins (Weil and Felix 1917, Felix and Ohtzki 1929) This is clearly demonstrated by tables I and II The proper technique is the one using round bottomed tubes and incubation at 37°C (Felix 1944) The necessity for standardising these tests by international agreement has been stressed recently (Felix 1950), and the suggestion that "international serum standards" be adopted has been accepted by the Expert Committee on Biological Standardisation of the World Health Organisation (1950)

How great is the need for standardising these tests is shown by the observations on 14 cases of Brill's disease published by Murray et al. (1950) These workers found that "only 3 of the 14 patients had a diagnostic agglutina

among the urban immigrant population in the north eastern United States—remained obscure Its epidemiology was compatible with transmission by neither the louse nor the rat flea Mooser (1929) emphasised that the earlier guineapig experiments (Anderson and Goldberger 1915) had shown definitely that Brill's disease in New York was due to typhus virus imported from Eastern Europe, but this view was disregarded

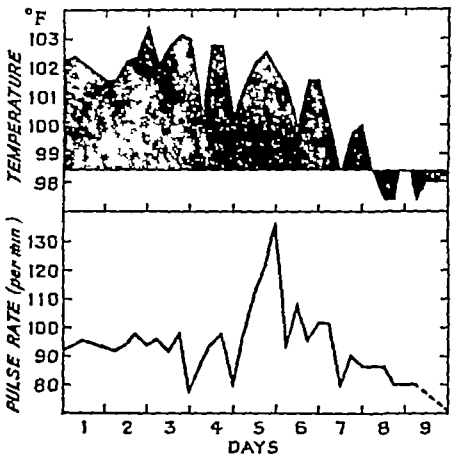

Chart from admission to hospital on eighth day of illness

Subsequently Zinsser and Castaneda (1933) isolated from a case of Brill's disease in Boston a typhus strain that was clearly of the European louse borne variety and Zinsser (1934) concluded from statistical investigation that the cases of Brill's disease observed in New York and Boston represented recrudescences of old infections originally acquired in European foci

This rather surprising explanation of the nature of Brill's disease was not generally accepted until recent advances in the serology of the typhus group provided convincing evidence in support of Zinsser's observations By the use of complement fixation tests with murine and louse borne rickettsiæ, Plotz (1943) was able to show beyond any doubt that New York cases of Brill's disease give the same reactions as those obtained in cases of Old World louse borne typhus

TABLE I—LABORATORY INVESTIGATIONS

Sept 22—Blood count total white cells 10 000 neutrophils 62% lymphocytes 33% monocytes 4%, and eosinophils 1%
Sept 27 to Oct 9—Four fæces cultures all negative for salmonella, shigella, and *Proteus*
Sept 21 to Sept 23—Two catheter specimens of urine normal
Sept. 23—Aerobic and anaerobic blood-cultures remained sterile during three weeks incubation
Sept 24 and 29—Widal and *Brucella abortus* agglutination tests negative

Weil-Felix Tests Agglutination Titres

Date	OX19	OX2	OXK
Sept 24 1948	200	200	80
Sept. 29	700	160	—
Oct 4	200	40	40
Oct 8	200	40	40
Oct 12	160	—	—
Oct 15	140	—	—
Oct 19	120	—	—
Nov 9	40	20	20
March 21, 1949	40	20	20

The immigrants who develop Brill's disease in the United States usually give a history of having had typhus while in Poland or Russia Evidently *R prowazeki*, the causative agent of louse borne typhus, persists indefinitely in some recovered typhus patients, and when the resistance is lowered induces a mild attack of the disease

THE PRESENT CASE

Mrs A, aged 49, began to complain of headache and pains in her limbs while she was at work on Sept 18 1948 The pains got worse and were not confined to joints, being felt throughout the limbs Insomnia was present from the onset She consulted her doctor on Sept 18 and was found to have a temperature of 104°F Sulphadimidine ('Sulphamezathine') was given without effect Her symptoms had not changed by the eighth day of illness and she was admitted to hospital on Sept 20 Her condition was then satisfactory temperature 102 4°F, pulse rate 94, respiration normal She was irritable and the taking of her history was difficult There was no rash, the mouth was normal and the tongue moist, the spleen was not palpable, and the only other physical signs of disease were scattered rhonchi in the chest There was, however, suffusion of the conjunctivæ and the pupils appeared slightly contracted No particular smell was noticed

TABLE II—RESULTS OF WEIL-FELIX TESTS CARRIED OUT AT THE CENTRAL ENTERIC REFERENCE LABORATORY, PUBLIC HEALTH LABORATORY SERVICE, COLINDALE *

Specimen of serum collected		Titre of agglutination with		
Date	No of days since onset	OX19	OX2	OXK
Sept 29 1948	18	800	25	50
Oct. 8	27	800	25	50
Oct. 12	31	800	25	50
Oct 15	34	600	25	50
Oct 19	38	400	25	50
Nov 9	59	200	25	50
March 21, 1949	191	100	25	50

* The tests were carried out according to the technique described by Felix (1944) using suspensions prepared at the Standards Laboratory for Diagnostic Reagents, Public Health Laboratory Service Colindale

The patient was born in Poland and had typhus there in 1915 (She remembers the rash, that she was in coma a considerable number of days, and that all her hair was shaved off) She migrated to Berlin when 19 years old and came to England in 1939

The fever, and the symptoms, remained unchanged for four days On the fifth the temperature began to fall and by the eighth she was afebrile (see figure) and feeling weak but otherwise better

A tentative diagnosis of Brill's disease was made, and investigations were undertaken (table I) All were negative except the Weil Felix tests

The first two Weil Felix tests were done by the same technician using the same suspensions that had been prepared a few days previously by diluting the Standards Laboratory concentrated suspensions 1 in 15 and storing them in the refrigerator The readings were checked by one of us (E J S) All the subsequent tests were made using the Standards Laboratory concentrated suspensions diluted freshly on each occasion 1/15 in physiological saline Equal volumes of the diluted suspensions and the serum dilutions to be tested were set up in Dreyer s tubes and incubated in a 50°C water bath for four hours They were then allowed to stand at room temperature overnight and read in the morning Saline

TABLE III—RESULTS OF RICKETTSIAL COMPLEMENT-FIXATION AND AGGLUTINATION TESTS CARRIED OUT AT THE DEPARTMENT OF VIRUS AND RICKETTSIAL DISEASES, ARMY MEDICAL CENTER, WASHINGTON

Date of serum	Day of disease	Complement fixation		Rickettsial agglutination	
		Epidemic	Murine	Epidemic	Murine
Oct 8 1948	27	positive 1 640	positive 1 40	negative 1 40	negative 1 40
Oct 15	34	positive 1 2560 A/C* at 1 40	positive 1 320 A/C at 1 40	positive 1 640	negative 1 40
Oct 19	38	positive 1 1280 A/C at 1 20	positive 1 160 A/C at 1 20	positive 1 320	negative 1 40
Nov 9	59	positive 1 1280 A/C at 1 20	positive 1 160 A/C at 1 20	positive 1 80	negative 1 40
March 21 1949	191	positive 1 160	positive 1 20		

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Accuracy in Red-cell Counts

When the physician asks the laboratory for a red cell count on an anæmic patient he will often rely largely on their findings for both diagnosis and the control of treatment Much weight is also placed on the colour-index, which shows whether the red cells contain more or less hæmoglobin than normal, and the value of this index depends on the reliability of the red-cell count Yet for over forty years the accuracy of red cell counts has been criticised In 1906 "Student" [1] showed that there is an irreducible statistical error in counting red cells, or any similar particles, which is roughly inversely proportional to the square root of the number counted, when 500 cells are counted, this error amounts to about 4% Other errors are likely to arise but can be minimised One is the error of sampling, since a single drop is taken to be a representative sample of the patient's whole blood, then calibrated instruments are likely to vary, particularly dilution pipettes, errors of technique, such as tying a tourniquet round a finger and squeezing out the blood, will be significant unless technicians are properly trained, and finally, operators differ in the skill with which they judge the filling of pipettes or count cells in the counting-chamber, for example Thus, when Berkson and colleagues [2] did a series of red-cell counts with the usual apparatus, paying as much attention to avoidable errors as they could, it was not surprising that their minimum error was greater than the statistical 4% They used a single pipette and one counting-chamber and counted the cells in 80 small squares of the ruled area, which is the usual practice They found that with a normal count of 5,000,000 per c mm, when 500 cells were counted in the 80 squares, the coefficient of variation was 7 8% This expresses the minimum error, the probable limit of error, which will not be overstepped more than once in 20 times, is usually taken to be twice the minimum error, in this case ± 16% This is a very wide range In practice it means that a count of 5,000,000 may be obtained from a patient who in fact has anything between 4,200,000 and 5,800,000 red cells per c mm Similarly, with a count of 4,000,000 the range is 3,360,000 to 4,640,000 per c mm

Calculations of this kind have not deterred clinicians from using the red cell count, and such estimates of the probable range of error have been strongly contested Wintrobe,[3] for example, states in his textbook that, with trained technicians, "it will be found that, with practice, counts agreeing within 200,000 cells per c.mm can be made." This has been the general opinion among clinical pathologists, and they have acted on it In 1948 Biggs and Macmillan [4] re examined the question Berkson and colleagues had used photographs of microscope fields for counting red cells in the counting chamber, Biggs and Macmillan had the counting done directly, as in practice With five observers, ten pipettes, and ten chambers their minimum error was 9 46%—somewhat larger than that of Berkson et al With this degree of error, if a patient's initial count is 2,000,000 per c mm, subsequent counts must be under 1,400,000 or over 2,600,000 before a significant fall or rise can be claimed This range of error is larger than that of other methods of assessing anæmia, apart from the colour-index and the mean cell volume, which necessarily reflect the inaccuracy of the red cell count

Thus for hæmoglobin, Biggs and Macmillan put the minimum error at 5 2% with the Haldane method and 3 3% with the neutral grey wedge method, whereas for the hæmatocrit it is only 0 5% They therefore concluded that laboratories were wasting their time in doing red cell counts at all, and in training technicians to do them They proposed to assess anæmia by determining the hæmoglobin and the hæmatocrit and hence calculating the mean corpuscular hæmoglobin concentration (M C H C) But the M C H C is normally at maximum, it may vary below, but not above, the normal value Consequently, in macrocytic anæmias, further information is needed, Biggs and Macmillan proposed to get this by estimating the mean red cell diameter, and if the estimate is to be reasonably accurate it must be based on a Price Jones curve This is likely to prove a serious obstacle in the campaign for more accurate assessment of anæmia in the clinic For a Price-Jones curve takes at least half an hour to construct, and the equipment is not commonly found in clinical laboratories Unfortunately it is in the macrocytic anæmias that the clinician most often needs quick results for prescribing future treatment or assessing the activity of liver extracts or similar materials Much of this work is done in outpatient clinics, and few clinical laboratories could meet a demand for ten to twenty Price Jones curves at one time Yet the position cannot be left where it is If in a patient with pernicious anæmia the red-cell count falls from 4,000,000 to, say, 3,200,000 per c mm, the clinician will certainly infer that a relapse is imminent and raise the dosage Again, claims for the activity of anti anæmic materials have been based on an increase in red cells from 2,000,000 to 2,500,000 per c mm Yet such changes as these are within the range of error of counts done under the best conditions

To dispense with the red-cell count altogether would clearly impair our assessment of anæmia, because it cannot be readily replaced And the immense inertia of generations of clinicians accustomed to use the red cell count and the colour-index must be taken into practical account There is good reason, therefore, for the renewed efforts being made to improve the accuracy of red cell counting by adopting electronic methods of counting particles By such methods large numbers of cells can be counted in a very short time, so reducing the statistical error Elimination of the human element in the actual

1 Student, *Biometrica*, 1906–7 5 351
2 Berkson J Magath, T B Hurn, M. *Amer J Physiol* 1940 128 309
3 Wintrobe M. M. Clinical Hematology Philadelphia 1946 p 253
4 Biggs R Macmillan R L *J clin Path* 1948 1 269 288

Dr. Robert Reig Library

tion titre in the Weil Felix test," and "that this test in the majority of cases is more apt to be misleading than helpful." Murray et al did not state what technique they employed in the OX19 agglutination test, but a glance at their tables 4 and 5 shows that in 12 of the 14 cases a negative result had been obtained at some stage of the disease, or throughout its course, in a dilution as low as 1 in 10 This is contrary to what has been firmly established by investigations conducted in nearly all parts of the world in regard to so called normal OX19 agglutinins, and indicates that the technique employed was unsatisfactory, because it evidently reduced the sensitivity of the test far below the permissible minimum Murray et al also quote Blattels (1928) and Schoenbach (1949) as having noted negative Weil Felix reactions in Brill's disease The former examined 45 cases during 1920–28 and observed only 2 positive reactions, but his paper does not give any indication of titres or technique employed, and it is known from the careful investigations by Spencer and Maxcy (1930) and Davis and Parker (1932) that unsuitable cultures and methods were in use in the test in the United States at that time The same criticism applies to the paper by Schoenbach (1949), who described negative *Proteus* OX19 reactions in a case of Brill's disease in Baltimore without stating titres or technique Morgan et al (1948), on the other hand, were apparently well aware of the pitfalls and had the sera examined from their 2 cases of Brill's disease simultaneously in two laboratories In one of their cases the Army Medical Laboratory, Washington, reported OX19 titres 8 times higher than those recorded at the B City Hospital In the London case of Brill's di the tests carried out in two laboratories showed a fourf difference in titre (tables I and II)

From the epidemiologist's point of view, Brill's di is of interest as a possible source of dissemination louse borne typhus In the series of 14 pa investigated by Murray et al (1950) *Rickettsia prowa* was isolated by louse feeding in half the cases, a remar able achievement accomplished by perfect team w between laboratory workers and clinicians In view the widespread epidemics of louse borne typhus the war of 1939–45 and the post war movement of la groups of people from one country to another, it se likely that cases of Brill's disease may come i prominence in many parts of the world

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Reviews of Books

The Child in Health and Disease

Editors CLIFFORD G GRULEE, M D, Rush professor of pediatrics, University of Illinois, R CANNON ELEY, M D, associate in pediatrics and communicable diseases, Harvard University Medical School Baltimore Williams & Wilkins London Baillière, Tindall, & Cox 1948 Pp 1079 66s

THIS new American textbook on pædiatrics has been compiled by no fewer than seventy-five contributors under the editorship of two eminent pædiatricians—Prof Clifford Grulee, of the University of Illinois, and Dr Cannon Eley, of Harvard University and the Children's Hospital, Boston The work was undertaken some years ago, but the war interrupted it and all the manuscripts had to be rewritten The writers have achieved a comprehensive and well-balanced book in which clinical and scientific pædiatrics are happily blended The volume is divided into nineteen sections, beginning with physical and mental development, nutrition, the newborn, and prematurity The latter part of the book consists of sections on the eye, the teeth, adolescence (a welcome addition to a pædiatric textbook), and pædiatric surgery This "textbook for students and practitioners of medicine" is authoritative and up to date

Traitement chirurgical de l'otospongiose

MAURICE SOURDILLE, *professeur de clinique oto rhino laryngologique à la Faculté de Médecine de Strasbourg* Paris Masson. 1948 Pp 253 Fr 750

Professor Sourdille has been a successful pioneer in the treatment of deafness by surgery, and this book is a collection of his writings on the subject The first section is a reprint of an address delivered in 1929 when he described the two stage operation he had devised for making an opening into the external semicircular canal and a covering skin flap The number of cases treated in this way was small and the results are not given clearly enough for any estimate to be made of the value of the procedures An extended reprint follows of a report reviewing the work of earlier otologists presented in 1935 to the French Society of Otolaryngologists Two additions have been made to this report, one written in 1939 and the other in 1947 Inevitably this method of presentation has led to much repetiti but the author covers all the theoretical indications operation, and the physical factors involved, and gi a possible technique for achieving a patent opening in labyrinth without infection The subject is still c troversial, and many of the statements made would r be endorsed by other workers in the field Perha insufficient credit has been given to Lempert for his or stage operation The most serious defect is a lack o critical classification and survey of the results obtained

William Withering of Birmingham

T WHITMORE PECK, K DOUGLAS WILKINSON Bris John Wright & Sons 1950 Pp 240 21s

THE core of this book is William Wither great discovery of the therapeutic action of digit and the story is told with many interesting det At a time when the causes of dropsy were not kn and it was not realised that the heart played part, Withering indicated clearly that success digitalis can only be hoped for in certain cases—t with a feeble or intermitting pulse, livid lips, and skin—and that "the drug must not be persisted the pulse is retarded to an alarming degree" Prof Wilkinson, who seems to have been responsible for of the book, has so profound a knowledge of the hi of Birmingham in the 18th century that he is abl set the figure of Withering in a background as v as it is vivid Withering, after the manner of his t was philosopher as well as physician, and it was by labours of the philosophers that the rapid indus development of the day was made possible In famous Lunar Society at Birmingham the philosop met to exchange views on literature, art, science, above all the application of science to indus Withering was on terms more or less familiar Boulton of Soho, and his partner James Watt, Wedgw of Etruria, Priestley, Erasmus Darwin, and m others Dr Wilkinson brings old Birmingham to again

Outline of Anæsthesia from the Nurse's View (Reprinted from the *Hospital and Social Services Jou* 1950 Pp 24 1s 6d)—Sometime in her career, nurse is bound to come in contact with an anæsthe patient Dr C Langton Hewer's booklet sketches in suffi historical theoretical, and practical background to e her to look after such a patient with interest and intellig

ese criticisms, the staff seem to have adjusted themlves satisfactorily to the new regime Only 3% had iticism of new superior appointments under the scheme All who take the task of hospital administration nously will be well advised to read this report in etail, and to see how far the cap fits in their particular stitution. "The seniors get soup and coffee for the ime price as we pay," says an assistant nurse, "and e aren't even allowed to pay extra to buy them"

"If there is a system of promotion, no one knows bout it, I suspect some fiddling goes on" Night nurses should get a breakfast type of meal in he morning" "Male nurses should only be nswerable to male charge nurses, sisters treat men ike little girls—it s bad" This is a hospital coming o life on paper, with the petty irritants exposed to iew Perhaps a time will come when social accounting n hospital life will be no less important than financial accounting, and trained personnel officers will be part of the establishment But of course it would be easy to carry this sort of thing too far

Laryngeal Vertigo

SINCE CHARCOT[1] first described a syndrome of sudden unconsciousness during a coughing-attack, interest in the condition has waxed and waned in an odd way Probably because CHARCOT called it laryngeal vertigo, thereby linking it with the throat, the physician, especially the chest physician who sees the bulk of the cases, often looks on it as outside his province and is relatively ill-informed on the subject This is a pity, for it is not uncommon, it has a good prognosis, and its mode of production is a worthy theme for speculation BAKER,[2] who has collected 9 cases from the records of Guy's Hospital over eight years, and has analysed the published data, builds up a composite picture of the patient He is a middle aged man (there were only 6 females among the 177 cases analysed), over-weight and often obese, and, as might be expected from his build, "does himself pretty well", in fact, the attacks often occur while the patient is enjoying company and alcohol. Naturally enough, he combines self-indulgence at the table and the bar with a heavy use of tobacco By the time he sees the doctor he has a chronic cough and is emphysematous and plethoric but, curiously enough, rarely hypertensive or arteriosclerotic (Possibly those with associated cardiovascular disease do not live long enough to develop Charcot's syndrome) His voice is as rough and loud as his frequent laugh, for laughter comes easily in the surroundings where he is usually found. He becomes subject to minor or major attacks of laryngeal vertigo The major attacks, which are more readily recognised than the minor, typically begin as a tickle or irritation in the throat, followed by peculiar irritating coughs which increase in violence until, with suffused congested features, the man falls unconscious The unconsciousness rarely lasts as long as a minute and is usually over in a few seconds He then gets up, pale but apparently quite composed and otherwise normal, and continues his activities from where they were dramatically interrupted He is never incontinent and does not bite his tongue, but he may injure himself by his sudden fall Minor attacks begin in the same way, but do not go on to unconsciousness They cause an odd sensation of giddiness without any loss of equilibrium

CHARCOT's name for the syndrome was justified, but the emphasis on the larynx and the giddiness has obscured the more disturbing symptom of abrupt loss of consciousness This sign of cerebral involvement, suggestive of a serious organic lesion, gives a special significance to the prognosis and hence to the mechanism of the curious sequence of events BAKER reviews the known facts and the various theories built on them One view is that this is a form of epilepsy and the attacks arise as a primary cerebral disturbance But only 4 of the 177 patients were known to have any previous personal or family history of epilepsy, neither the nature of the attacks nor the type of person who gets them is in favour of epilepsy, and lastly, all 3 of ROOK s[3] cases had normal encephalo grams, which is strong though not conclusive evidence against epilepsy CHARCOT originally postulated that the attacks were initiated reflexly from the larynx, though he later[4] admitted that in 2 of his 4 cases he could not find any laryngeal lesion However, nearly all hearty middle aged men have some degree of chronic laryngitis, and if this irritation, or the disturbance of intralaryngeal manipulations, could cause reflex cerebral activity and lead to the syndrome one would expect laryngeal vertigo to be much more common Some of the early cases might have been examples of the carotid sinus syndrome, but this is not associated with coughing and occurs in a more diverse group of people Most of the later reports of laryngeal vertigo mention that pressure on the carotid sinus did not produce an attack.

Cough is the common factor in nearly all the recorded cases and underlies the production of the attacks Some of these coughing fits culminate in spasm of the laryngeal muscles, and it has been suggested that this is the essential event and leads to cerebral vascular changes which cause the dizziness and loss of consciousness An analogy can be drawn with similar occurrences in whooping-cough which have always been presumed to be vascular in origin A peculiar form of cough seems to be necessary to induce the glottic spasm—a hard jerky series of unproductive coughs against a closed glottis, leading to an uncontrollable bout which ends in dizziness or unconscious ness The immediate effect of the coughing is to raise the intrapleural pressure and obstruct the venous return through the superior and inferior venæ cavæ This is shown by the suffusion of face and neck which occurs early in the attack. Cerebral congestion may produce dizziness and mental confusion, though rarely, it seems, unconsciousness Prolongation of the raised intrapleural pressure reduces the filling of the left ventricle and hence causes a fall in cardiac output and blood-pressure Cerebral anoxæmia follows and is probably the reason for the loss of consciousness, as in Stokes-Adams attacks The sequence of events is intensified when the lung tissue has lost a considerable amount of its elasticity and when the chest is fixed, as in emphysema, for a rise in intrapulmonary pressure is then more easily transferred to the intrapleural pressure Thus the predominance of males is explicable, since men are more addicted to tobacco and alcohol which irritate the larynx and lead to chronic

1 Charcot T M *Gaz méd Paris* 1876 5 588
2 Baker C *Guy's Hosp Rep* 1949 98 132
3 Rook, A. F *Brain* 1946, 69 138
4 Charcot T M. *Prog méd Paris* 1879 7 317

counting helps to reduce the total error still further The first attempt, by LAGERCRANTZ,[5] was of little clinical use because the mean diameter of the cells had to be known before the result could be calculated But now WOLFF[6] at Oxford reports that he has overcome this difficulty His counter, the details of which are not yet published, has a special chamber moved mechanically so that a microscope objective fixed above it scans a number of parallel lines An important feature of the machine is the provision of special stops in the back focal plane of the objective which determine the width of the scanning The light transmitted through the stops falls on a photo multiplier, and the signals passed on are amplified and mechanically recorded WOLFF claims a coefficient of variation of 2 1% , so if the machine gives a count of 5,000,000 there is a 20 to 1 chance that the actual number of red cells is between 4,790,000 and 5,210,000 per c mm , or if the count is 2,000,000 that the number per c mm is between 1,920,000 and 2,080,000 This accuracy would satisfy both the statistician and the clinician If the counter turns out to be robust, reliable, and not too expensive, it will soon be part of standard equipment , and when it is used as a routine the red-cell count and colour-index will regain—this time justly—their former prestige

The Happy Ship

MOST people who have worked in, or visited, a representative sample of hospitals will agree that their morale varies widely, like that of ships at sea In the Navy, the happiness or unhappiness of a ship usually depends on the commanding officer leadership, good or bad, is infectious But the leader of a hospital is nowadays hard to identify Is it the medical superintendent, where he remains ? He will almost certainly say that leadership has passed from him , that what authority he once enjoyed has been whittled away , that the senior medical staff can by-pass him since they are in contract with the regional board , that the senior lay administrator receives communications direct from Ministry and region, which he shows to the superintendent at his discretion Is it the lay administrator ? Some of those least fit to lead will certainly reply that it is their right and duty to do so , while the more modest and perhaps more efficient will explain the difficulties of divided authority Is it the chairman of the medical committee, or the chairman of the management committee ? The former is at best only advisory outside his narrow clinical sphere The latter, dependent on his officers, and a spare time hospital visitor only, cannot know the true inwardness of hospital life

So it comes about that many hospitals are now less happy than they should be Morale is faulty because the new hospital democracy, modelled on that of the voluntary hospitals, has not yet found the institutional traditions which provide an alternative to authoritarian direction When chiefs are unsure of themselves, or when tyrants are given their head, anxiety and bullying swiftly spread down the chain Trifling injustices get magnified into tragedies, and there is no universally recognised code of behaviour under which to take shelter Though a wise outsider can often identify the point at personality defect is throwing things out of joint, the remedy, which must often be dismissal, is usually impossible to apply Nevertheless, on the other side of the picture, there are in any large organisation a great many points where the application of oil will alleviate unhappiness, and it is good to see a start being made in the study of these friction points The department of social science of the University of Liverpool has made a survey of employment relations in the Central Wirral Hospital Group, which, as we have already noted,[1] has now been published by the hospital administrators' own professional body[2] It is greatly to the credit of the committee, secretary, and staff of the Central Wirral group that they have been not only ready but anxious to submit themselves to the impartial scrutiny of outsiders

A quarter of the entire staff of the group (numbering 938) was interviewed on a random sampling basis Some 31 questions were asked, ranging from "Do you like your work ?" to "What are your views on the National Health Service, particularly in relation to your work ?" Of those interviewed, 87% felt that their hospital was a happy place in which to work, 9% thought it was not, and 4% were doubtful. Every one of the 9% was employed in one of the two largest hospitals in the group, and there were comparatively more feelings of dissatisfaction about every aspect of employment at these larger hospitals When we consider optimum hospital size, it is worth remembering that the smaller the hospital, the higher appears to be the morale When asked what changes they would like to see, the staff proposed alterations which are classified as follows

Joint consultation	84%
Catering facilities	40%
Amenities and services	40%
Conditions of work	33%
Promotion	15%
Wages	13%
Discipline	9%
Relations with supervisor	7%
Training	5%
Facilities for patients	3%

On specific subjects, the highest levels of dissatisfaction were catering 42%, promotion 41%, recreation 32%, and discipline 23%, while the figure for dislike of actual work was the lowest—only 5% When asked why they took up hospital work, 72% of nurses said it was because they were interested in hospital work, 13% said that it was the best job available, and 1% mentioned a desire to serve the community (No fewer than 13% of the administrative workers mentioned a desire of this kind) Criticisms of the National Health Service came largely from those who deplored the passing of the voluntary hospitals "Our friends should make collections for us again" "the pay bed system should be restored" "they treat the nurses like dirt now" "patients are now out for all they can get" "there are too many lay committees poking around" It would be true to say that these are *prestige* criticisms , and "job prestige," particularly for humbler folk, is a vitally important matter Apart from

5 Lagercrantz C *Nature, Lond* 1948 161 25
6 Wolff H S *Ibid* 1950 165 967

1 *Lancet* 1950 i 1159
2 Employment Relations in a Group of Hospitals By JOAN WOODWARD M A Published by the Institute of Hospital Administrators Tavistock House North Tavistock Square London W C 1 Pp 115 5s

these doctors had settled, not in areas where doctors were overworked, but in areas where patients were already too few to provide a reasonable income to the practitioners established there Furthermore, "it is not fair to the young men who are at the moment in our universities that in this transitional period the country should be flooded with doctors, so that when they are qualified in the near future there will not be a single area where they will be able to find a sphere of work for themselves" Mr Quin insisted that the aim of the Bill was, not to establish a "closed shop," but to achieve a temporary standstill during which a scheme for redistributing the general medical services could be worked out That recent developments have told hard on some doctors was testified by Mr W M Wilton He told of a district with 300 houses where a doctor has been practising for some time Within the past few months two other doctors have arrived from another part of the country and set up practice beside him "The result is that there is not a living for any of them"

Professor Corkey observed in the debate that in the Act of 1948 the aim had been to preserve the doctor's liberty to practise where he would This liberty, it seems, can be as damaging to the profession itself as to any other group, and the medical negotiators will probably agree that restrictions should be imposed, in order to protect those whose livelihoods are threatened

A NEW LEAGUE AGAINST EPILEPSY

"ABOUT epileptics," the late Dr Tylor Fox wrote in 1947, "it may indeed be said that only knowledge of the truth will set them free"[1] Throughout his life, much of which was spent in the care of epileptics at Lingfield Colony, he was constantly teaching the truth about epilepsy—that it is a symptom only, and that because they have this one manifestation in common, a large and varied group of people are classed together Ignorance and prejudice ascribe other characteristics to the group as a whole, and thus increase the social handicap under which those with epilepsy suffer Dr Fox's wish to see people better informed about epilepsy went very deep, and he wrote much on the subject He thought very well of the American leagues of lay people[2] which use articles, lectures, and broadcasts to spread enlightenment

On July 7 a group of interested people met to form a British league of like kind, with which his name is to be associated as a memorial Lady Cynthia Colville, who presided, suggested that the aims of such a league must be to create a proper understanding of epilepsy in the public, to establish an information and advisory service, first in London and then at centres all over the country, to set up hostels and convalescent homes for those with epilepsy, and to publish for them accounts of recent developments in the study or treatment of the condition Dr Macdonald Critchley suggested that the American leagues might well be able to supply useful experience, and undertook to find out more about them Dr Letitia Fairfield spoke of the revolution brought about in our understanding of epilepsy by the electro encephalograph, and the difference in alertness and physical well being which modern methods of treatment have made to patients But they are still excluded from most convalescent homes, they still have difficulty in finding employment, and they are expressly excluded by many voluntary societies from their activities

Dr Russell Brain paid great tribute to Dr Fox as a humanist as well as a doctor For scientists, as Dr Dennis Williams said, epilepsy offers a means of studying the function of the brain their researches must ultimately benefit those with epilepsy, but their aim is not primarily the care of individual people That is a task for a lay society, which should, he thinks, be concerned particularly for the otherwise normal person with epilepsy Physicians, he suggested, should not be invited to be members, but should be merely advisory Mr Maguire, lay superintendent of St David's Hospital, has the charge of 200 epileptic men and boys over the age of sixteen He was able to describe from first hand knowledge how people with epilepsy are penalised in the labour market because of their symptom There is some reason for it industrialists find that when an employee has a fit the rest stop work and gather round, and he has been shown figures demonstrating how much it costs the firm every time a man has a fit Mr Blacksaw remarked that, as a schoolmaster, he had had much the same trouble over the epileptic child These difficulties are a good measure of the need for education school masters and then children, employers, and then employees, must learn to take a fit as casually as the person who has had it does (if he is allowed) in retrospect Dr W S Maclay drew attention to the ruling of the Ministry of Health that epileptics are not "sick" people, or rather that they may be sick epileptics or well epileptics This has advantages, for if they are held to be sick they cannot be registered under the Disabled Persons Act

The league was formed by unanimous consent Miss Irene Gardner, who has been secretary of the working party planning the league, agreed to continue in office, and Lady Cynthia Colville consented to go on acting as chairman A provisional council was appointed, and a subscription of a guinea for complete membership was agreed on The league has been formed under the auspices, but independently, of the National Association for Mental Health, and is receiving encouragement and support from the British branch of the International League Against Epilepsy It deserves great success

1 *Lancet* 1947 i 775
2 See *Lancet* 1944 i 23

ANTIBIOTICS IN THE USA

SINCE deep tank fermentation replaced flask cultivation as the routine large scale method of preparing penicillin, there has been a rapid and continuous increase in the demand for antibiotics Their manufacture has now become one of the major chemical industries in the United States, where, according to J E McKeen,[1] it is estimated that some 80% of the world supplies are now prepared At least 13 firms, he says, manufacture penicillin and 17 make one or more therapeutic agents by aerobic fermentation When streptomycin was first prepared commercially in 1946, 1132 kg was produced, three years later the figure had risen to 83,699 kg It is calculated that 30% of the cases passing through a doctor's hands can be treated with antibiotics, and in 1948 almost half the drug bill of New York department of hospitals was for penicillin and streptomycin Research continues not only to develop antibiotics which will be active against recalcitrant diseases, but also to increase the range of those that are effective when taken orally

—	1929	1935	1939	1942	1947	1949
Acetylsalicylic acid			5	6	12	15
Antibiotics				1	82	160
Anti histamines					2	35
Arsenicals and bismuth pre preparations	3	3	3	5	4	2
Barbiturates	8	6	9	18	26	30
Biologicals	7	8	9	20	23	29
Botanicals	15	13	16	20	40	50
Endocrines		11	17	30	62	70
Sulphonamides			5	15	28	28
Vitamins		14	23	50	133	150
All others	137	78	92	100	133	145
Total	$170	$133	$179	$265	$545	$714

McKeen, who is president of Chas Pfizer & Co, Inc, gives the above figures to show the expansion of American production of "ethical" drugs—i e, those not advertised to the public—in recent years They are in millions of dollars

1 Addressing the Analysts Club of Chicago on May 24

cough, they cough more vigorously, and they are more liable to emphysema and rigid chests The cerebral anæmia is relieved immediately the intrapleural pressure drops, and this occurs when the coughing attack ceases, which it does automatically as soon as the patient loses consciousness Thus the loss of consciousness leads to its own recovery by a fortuitous cycle of events, and this view is supported by the fact that only 2 fatal cases have been recorded Treatment is simple, the avoidance of respiratory irritants being the most important Correct diagnosis is therefore all important, and once it is established there is little cause for alarm

Annotations

ACTION ON TUBERCULOSIS

LAST week a Scottish committee called for a "crisis expansion" of the tuberculosis service[1] Further welcome evidence of a new effort to cope with the disease now comes from the Ministry of Health,[2] which points out that "many more beds must be made available quickly, without waiting on progress in making good the lack of staff which is a major cause of the present shortage of accommodation" The Minister, deeming it necessary that a proportion of beds in general hospitals should be used for tuberculosis, now "asks regional hospital boards and boards of governors to apportion for the admission of respiratory tuberculosis patients as many beds as reasonably possible in suitable general hospitals," and also suggests that boards should consider how far they can use beds in isolation hospitals for the same purpose He does not specify what proportion of beds should be allocated to tuberculosis he has said that "there can be no set rule about this"[3] But the figure of 10% has been mentioned, and obviously there will be objections from some of the boards, which will have to exclude other patients if they are to clear the separate wards they are now expected to provide We must hope, however, that any necessary pressure will be exerted, and as a first step the Minister proposes "to invite reports from boards in due course about the arrangements they have been able to make in these matters"

The use of beds in this way should, he says, be limited as far as possible to recoverable cases, and "there should be a check on any tendency to retain patients in institutions longer than is justifiable" He suggests that boards should make themselves familiar with the scheme in action at the Central Middlesex Hospital and the Willesden chest clinic, which combines rest and collapse therapy in the home with short periods of inpatient treatment "A high standard of clinical judgment is necessary to avoid recommendation of institutional treatment for cases in which it is not essential and for which domiciliary care would suffice," and selection at this stage should aim at using the special treatment available in institutions for those best able to benefit from it

"Every effort should be made to discover active tuberculosis at the earliest stage and to give the closest attention to contacts and the ascertainment among them of non reactors to tuberculin with a view to raising their immunity by B C G vaccination Chest physicians will recognise that it is important to concern themselves no less with prevention and aftercare than with their clinical work and that it is necessary to give sedulous attention to case finding and the supervision of the tuberculous family, including visitation in the home The occupational settlement of the tuberculous is part of their aftercare It needs to be closely coördinated with the treatment of the individual case and, therefore, to be no less the concern of the chest physician than the clinical management of the case

Though primarily addressing the hospital authorities —without whose vigorous action the present deplorable situation cannot be remedied—the Minister dr attention to the responsibilities of local health authori and to the important part to be played by gen practitioners in the campaign His memorandum the signal, so long awaited, for the regrouping of forces without which tuberculosis will continue infiltrate our defences and destroy so many hor Without going beyond "the limitations which the need for economy imposes" our resistance can, joint endeavour, be made more equal to the attack

1 *Brit med J* July 8 1950 p 61
2 Circular R H B (50) 64
3 *Lancet* July 8 1950 p 70

OPPOSITION TO A HEALTH CENTRE

THE Government's ban on building has been general accepted as a reason for not having health centre and many people talk as though the creation of such centres depended purely on bricks and mortar Actually the immaterial problems may at first prove just intractable as the material ones—which is one of the reasons why experimental centres should be set up various parts of the country without further delay even if the buildings fall short of the optimum A sharp reminder that something more than a suitable building is needed if a centre is to flourish has come from Sheffield There, at Firth Park, the opening of a centre is being delayed because, it seems, of the reluctance of the doctors who intended to work there to do so against the wishes of their neighbours. Both the executive council and the city council are unwilling to abandon the project, and the matter has now been referred to the Minister of Health If it were decided later to advertise for doctors to staff the centre, this would worsen the position, it would be better for the local doctors to accept the entry of their colleagues into the centre rather than have new doctors imported from elsewhere To import new doctors would be hardly fair to those who have stood back, and it certainly would not augur well for the success of the scheme

Difficulties of this sort were foreseen, and awareness of them underlies the decision to limit, in general, the construction of centres to areas where the population is growing But it is a daunting thought that, supposing the building resources were there, centres could be developed only as quickly as the population was rehoused For the places where they are most needed are the centres of our industrial areas—such as Sheffield

PRACTICE IN NORTHERN IRELAND

THE Health Services (Temporary Provisions) Bill, which last week was read a second time in the Northern Ireland Senate, owes its origin largely to the fact that the Health Services Act of 1948, unlike the National Health Service Acts of England and Wales and of Scotland, contains no provision for regulating the entry of doctors into general practice Thus, while thickly populated industrial areas are no less underdoctored than before, more attractive districts are rapidly becoming overcrowded with doctors The effect of the Bill will be to prevent new practitioners, except those already in assistantships, from beginning to take patients The measure is to be effective for only six months, during which the ministry of health and local government will seek to work out a solution with the medical profession

In the Senate debate, Prof R Corkey remarked that Northern Ireland has more doctors per thousand of the population than any other part of the United Kingdom Since the Act of 1948 came into operation, an unprecedented number of new doctors had entered the country In the past the number required to replace wastage was between 10 and 20 per annum yet in the twelve months up to March 31 no fewer than 48 new doctors had entered the services of the General Health Services Board, and in the three months since then a further 22 had demanded places among the "panel doctors"

oard itself, rather than to a multiplicity of management ommittees Organisation along such lines may well rovide the answer to problems now facing all regions n the development of their service in pathology

ACCESS TO THE SERVICE

The facilities of the National Health Service in pathology must be as freely available to patients under reatment by their own general practitioners as to those n, or attending, hospital Time was when the only means of access open to the general practitioner wishing to obtain the opinion of the pathologist on his patients lay through one of the medical or surgical outpatient clinics of the hospital Before the appointed day an increasing number of the (then) voluntary hospitals had made it possible for practitioners to refer their patients directly to the pathological departments, but there were still many hospitals in which no such provision was made Reluctance to permit general practitioners direct access to the pathological department was to be found both on the part of certain pathologists and also of their medical and surgical colleagues

A considerable change has been wrought in the climate of opinion by the National Health Service Act and it is now accepted that the services of the pathologist and his department must be freely open to all practitioners working under the Act and not to members of the hospital staff only, this is the "open door," demanded by National Health Insurance practitioners for many years past

The adoption of this principle makes it necessary that hospital laboratories should be provided with waiting rooms and accommodation for the examination of patients and the collection of specimens of all sorts Few of the laboratories of the old voluntary hospitals and fewer still of the municipal hospitals possessed such facilities It will be the concern of regional boards and hospital management committees to see that such accommodation is provided as expeditiously as possible, in the meantime a great deal can be and is already being done by improvisation.

EXCESSIVE DEMANDS ON THE SERVICE

There are those who fear that the provision of facilities for pathological investigations for all patients under the National Health Service, in and out of hospital alike, will lead to a vast increase in the number of laboratory investigations, many to no useful end They point out that already many hospital laboratories are overwhelmed by the requests for examination on patients actually under hospital treatment It is customary to blame this increase of useless investigations upon the junior house staff and it is not unusual to hear senior clinicians attributing the decay of clinical sense to the baneful influence of the laboratory, but this is to confuse cause and effect. In the teaching hospitals, according to the testimony of those who have recently left them, less odium is likely to be incurred by demanding of the laboratory half a dozen investigations not really relevant to the case than by omitting to request a single one which may prove even remotely so It may be that it is not the business of the practitioners of purely clinical medicine to safeguard the pathological department, but it is most emphatically the business of the pathologist to do so and to ensure that its resources are not wastefully expended Not only that it is also his duty to see that those resources are employed to further clinical practice to the fullest possible extent To this end the presence of the pathologist is required in the wards both on the rounds of the senior members of the staff and for consultation with any member senior or junior as required, he must also be available for consultation at the bedside of patients under the care of their own practitioners in their own homes

It is the function of the pathologist to indicate those avenues of approach to clinical problems through the laboratory likely to be of avail, and to interpret the results of the investigations performed in his department in the light of the particular problem in question He must endeavour to persuade his colleagues that the bald facts and figures stated on his report forms are merely a part of the whole picture presented by the case, and that unless considered as such they are often useless and not uncommonly dangerously misleading

It is possibly significant that perturbation about the increase in the demands upon the hospital laboratory has found expression mainly among the academic members of the staffs of teaching hospitals This may be due to a very proper reluctance on the part of those whose main interest is teaching and research to sacrifice these in favour of routine A similar problem faced the early Church, the solution as set out in *Acts*, vi, 2, is eminently relevant

The seeds of corruption may lie within the whole organisation set up under the National Health Service Act, if so they will affect the service in pathology along with those in all other branches of medicine and must be dealt with as they begin to appear but if pathologists themselves play their part there need be no breakdown by reason of unbounded demands

The major danger threatening the service in pathology is common to the whole hospital service—in fact to the entire set-up under the Act It lies in the inflexibility of bureaucratic control There is a growing sense of frustration among pathologists, many of whom initially welcomed the extension of their departments made possible under the Act, and this arises largely from the necessity of doing everything through "proper channels" which even when discovered are likely to be found choked beyond capacity

None the less this attempt to develop a national service in clinical pathology constitutes one of the most interesting features of the new National Health Service. Nothing of the kind has been attempted in any country other than Great Britain It is possible to overrate the value of clinical pathology, but it has established its place in the field of medicine and that place must be a large one—how large it is at present difficult to say Further it is possible to develop clinical pathology along wrong and meretricious lines, it will take time to establish its place in the field of medicine—indeed it may never prove possible to determine that place with exactitude A standardised practice of clinical pathology, or of any other branch of medicine, is the last thing to be desired The initiation of the present service must be regarded as an experiment which with proper guidance may provide results of the utmost value to the development of medicine not only in this country but throughout the world

CENTRAL HEALTH SERVICES COUNCIL

First Report

THE Central Health Services Council and the associated standing committees provide the main professional advisory machinery in the National Health Service The duty of the council itself is

"to advise the Minister upon such general matters relating to the services provided under this Act or any services provided by local health authorities in their capacity as such authorities as the Council think fit and upon any questions referred to them by him relating to those services"

In the report[1] on its first eighteen months of work, the council declares that its task is "not only to consider

1 Central Health Services Council Report of the Central Health Services Council for the period ending December 31 1949 preceded by a statement made by the Minister of Health. H.M. Stationery Office Pp 33 1s

Special Articles

CLINICAL PATHOLOGY UNDER THE NATIONAL HEALTH SERVICE

S C DYKE
D M Oxfd, F R C P
PATHOLOGIST, THE ROYAL HOSPITAL, WOLVERHAMPTON

UNDER the National Health Service Act, 1946, we are now bringing into existence—for the first time in this or any other country—a service in clinical pathology, centred upon the national hospitals and designed to bring the pathological laboratory into the closest possible touch with the practice of clinical medicine The avenue of approach to clinical problems through the pathological laboratory was entirely ignored in the formulation of the National Health Insurance Act, 1911, in the National Health Service Act, 1946, its importance has been fully recognised, and we are now faced with the problem of developing this branch of medical practice so that it may best fill its place in the National Health Service It is essential that at this early stage we should have some general idea of how the service should be organised, and of its aims and scope

The organisation of the service in clinical pathology is determined by the fact that it is a part of the national hospital service Its growth and development must therefore proceed upon the foundation of hospital departments in pathology

THE REGIONAL HOSPITAL SERVICE

By far the greater part of hospital clinical practice in this country is carried on in what since the "appointed day" have become the regional hospitals, and their pathological departments must be the instruments of the national service in clinical pathology

It goes without saying that the regional service in pathology, as in all other branches of medicine, must work in the closest possible touch with the university centres It is essential that the regional workers be alive to the trends, tendencies, and recent advances in their subjects, and it should be a function of university teachers to keep them so But though all may work in the same spirit there are, as between the academic and the clinical pathologist, differences of administration and diversity of operations

The aims of the service in clinical pathology must be strictly practical. Its purpose is to give quickly all possible aid in the diagnosis and the control of the treatment of disease In fulfilling this function, the department will in its routine work, continually present opportunities for observation of the natural history of disease, the alert pathologist in such a department will be in a position to make valuable contributions to medicine, and may be regarded as delinquent if he fails so to do But organised research into problems not immediately related to the clinical practice of medicine are the sphere of university departments and of institutions devoted to and organised for that purpose It is an error to suppose that every regional hospital department of pathology must be a replica of the university or research department, and the attempt to organise them as such can only lead to waste of effort, personnel, and material alike

TECHNICAL STAFF

Clinical pathology is a rapidly expanding field, how rapid its expansion has been only those who have worked in it for the last quarter of a century can fully realise The central portion of the field has been thoroughly cultivated and can largely be left to the care of properly trained technicians working under the supervision of medically trained staff, such trained technicians will be required in increasing numbers The periphery of the field is continually expanding, it is in this periphery that new measures are tested and new techniques placed on trial, some of these will in due course be discarded, others will become matters of routine and will be passed into the hands of technical staff, leaving the medically-trained staff free to test and assay new procedures and attempt other lines of approach

GROUPING OF SERVICES IN PATHOLOGY

Every hospital must have its facilities for pathological investigations but that does not mean that every hospital must have a fully equipped and staffed pathological laboratory In the 14 hospital regions of England and Wales there are over 350 hospital management committee groups These groups vary greatly in size, some comprising one or even more than one active general hospital, others having within them no major hospital at all. There is a tendency for every hospital management committee to strive to function as an autonomous unit providing a service in all branches of medicine—pathology included—entirely under its own control The consultant staff is the responsibility of the regional board, but the lower ranks of the medically qualified and the whole of the technical staff, together with provision of equipment and of accommodation and maintenance of existing buildings, are directly the charge of the hospital management committee This disposition places the responsible head of a regional hospital department of pathology in the unfortunate position of being answerable to two bodies which may be far from seeing eye to eye with each other Extreme centralisation is bad but extreme decentralisation is even worse

FUNCTIONAL AREAS

It is to be hoped that the future may bring some degree of centralisation into the service in pathology As a step towards this it is essential that it be organised into "functional" areas which in many instances must overlap the boundaries of individual hospital management committees Pathologists working in any such area may well be based upon a certain hospital in that area, but they should be regarded as members of the area service and as working under the general supervision of one of their number who is recognised by the regional board as the head of the service in pathology of that area Similarly there should be opportunity for free interchange of technicians working within such a functional area, no matter by what hospital management committee they may be employed Technicians cannot be liable to arbitrary transfer from one hospital to another, but with their consent, and at the discretion of the head of the service, they may well from time to time and for stated periods be transferred to other laboratories within the area—either for purposes of instruction or to tide over an emergency Such an arrangement may interfere with administrative convenience, but entails no difficulties which cannot readily be overcome

Certain classes of work, requiring the use of particularly expensive apparatus or of specially trained staff, should be concentrated in one of the departments within the area This applies in particular to biochemistry and histology Only the laboratory of a major hospital can demand the services of a fully trained biochemist this is essentially one of those appointments which should be made to a functional area, and it would be well that it should be made by a regional authority Similarly, highly expensive apparatus should only be found in those laboratories where the bulk of work can justify its presence

At least one region has divided itself for the purpose of certain of its hospital services, pathology among them, into "clinical areas" having within themselves a certain degree of autonomy and oriented towards the regional

APPOINTMENTS

The Minister has lately made the following appointments to the council

Medical practitioners—Dr Janet Aitken, Prof Robert Cruickshank, Sir Stewart Duke-Elder, Dr W V Howells and Dr C W Walker

Persons with experience in hospital management—The Hon A. J P Howard and Mr F S Stancliffe

Persons with experience in local government—Mr A. F Bradbeer and Mrs Dorothy Thurtle

Dental practitioners—Mr Joseph Lauer and Prof R V Bradlaw F.R.C.S

Registered nurse—Miss Clare Alexander

The following appointments have been made to standing advisory committees

Medical—Dr Aitken, Professor Cruickshank, Sir Stewart Duke-Elder Dr Howells and Dr Walker

Dental—Mr C V Armitage and Mr Lauer

Ophthalmic—Dr Aitken and Sir Stewart Duke Elder

Nursing—Miss Alexander, Dr Horace Joules, the Hon A. J P Howard, Prof R M. F Picken, M.B., and Mr Stancliffe

Maternity and midwifery—Dr Aitken, Mr A. W Bourne F.R.C.O.G., Dr Howells Mrs Thurtle, Dr Walker, and Mr W Onions.

Mental health—Dr Denis Williams

Cancer and radiotherapy—Dr Howells

MEDICAL RESEARCH IN SCOTLAND

THE Secretary of State for Scotland has appointed an Advisory Committee on Medical Research in Scotland, to advise the Secretary of State on the "initiation, direction, coördination, and conduct of medical research" The committee's appointment follows discussions with the principals of the universities, the deans of faculties of medicine, and the presidents of the Royal Scottish Medical Corporations Besides advising the Secretary of State on research projects and recommending financial aid, the committee will be available to give advice to regional hospital boards, local health authorities, and any other organisation which feels it could benefit by it

Close contact will be maintained between the committee and the Medical Research Council, representatives of which are included in the committee's membership The committee will concern itself mainly with investigations that can best be done within the framework of the health services in Scotland The members are

Sir EDWARD APPLETON D.SC., F.R.S. (chairman) Prof THOMAS FERGUSON professor of public health, Glasgow University (vice-chairman), Prof. DUGALD BAIRD professor of midwifery Aberdeen University, Dr C A. BIGNOLD medical officer of health, Ayr county, Prof NORMAN FEATHER, F.R.S., professor of natural philosophy, Edinburgh University Prof. T FERGUSON RODGER, professor of psychological medicine Glasgow University, Prof. J H. GADDUM, F.R.S., professor of materia medica, Edinburgh University Prof. R C GARRY regius professor of physiology Glasgow University Prof S G GRAHAM, professor of child health, Glasgow University Dr H. P HINSWORTH, secretary of the Medical Research Council Sir JAMES LEARMONTH, professor of surgery and regius professor of clinical surgery, Edinburgh University Prof J W McNEE regius professor of practice of medicine, Glasgow University Prof. W J TULLOCH, professor of bacteriology, St Andrews University Prof. C H. WADDINGTON SC.D F.R.S., professor of animal genetics Edinburgh University

The joint secretaries are Dr F J C HERBALD, of the Medical Research Council, and Dr J M. JOHNSTON of the Department of Health for Scotland. Communications should be sent to Dr. Johnston.

At its first meeting on July 4, the committee considered the uncompleted work of various subcommittees of the Scottish Scientific Advisory Committee whose functions are included in the wider remit of the new body. The committee also agreed on procedure and discussed methods of handling new projects

REABLEMENT IN THE R A F.

A PATIENT recovering from an injury should never leave his cure entirely to others if he wants the job done properly he must do a good deal of it himself. This principle is so well understood at the new R.A.F Medical Rehabilitation Unit at Headley Court, Surrey, that a newcomer is at once invited to join a team of four bent on getting him fit again the other members being the medical officer, the physical fitness officer (trained in remedial exercises), and the physiotherapist The medical officer takes a full case history examines the patient and works out a remedial programme for him the physical fitness officer and the physiotherapist help him to carry it out and the medical officer checks his progress week by week

THE PATIENT AT HIS EXERCISE

His working day lasts from 9 15 A.M to 4 30 P.M and is mapped into half-hour periods Under the physical fitness officer are eight physical training instructors who have been trained at the older unit at Collaton Cross, near Plymouth and know all about the reablement of individual muscle groups At least one of them has his own muscles under such control that he appears to be able to twitch each one separately, and can ripple and shrug his abdominal wall in a way which would be the envy and despair of an Egyptian dancer Under these experts the patient begins his day with limbering-up exercises followed by physical training and games chosen to suit his special disability, in the afternoon there is more physical training, somewhat more interesting games, and a period called "instructor's choice" when a class may challenge another class to water polo play french cricket, take a cross-country run, do some gardening, or undertake some other diversion which offers the appropriate exercise but adds variety as a sauce to this usual dish

Patients begin in a small class and graduate to larger ones On admission they are grouped according to their injuries—quadriceps, legs, arms, spines (including posture) and so on These groups are split up into smaller classes according to the muscles and joints affected, and the classes are given separate instruction but also combine at times for training with the group Since exercises are apt to become tedious, each is accompanied by its own theme song, and heard from a distance the songs sound very well. As weak muscles gain power, patients graduate into larger and larger groups until they reach the mobile groups and are classed simply into "upper halves" and "lower halves." The upper-half group, recovering from arm and shoulder injuries or indeed any injuries above the waist, can undertake longer runs and more violent exertion with the legs than the lower-half group, whose injuries were below the waist, but otherwise patients who have reached the mobile grade are expected to be equal to very strenuous exercises The standard is exacting and when they finally leave is far above anything the ordinary man calls fit according to the physical fitness officer it takes them about a year to get over it.

In and out of this basic programme of physical training, the essence of reablement, are fitted sessions with the physiotherapist Much of the apparatus was designed and made by a "Technical Repair and Development" section of the R.A.F Electronic stimulators have been designed to give maximum muscle response with minimum skin stimulation Many of the machines are prototypes Occupational therapy also has its place in the programme, beautifully finished looms and other equipment are now in action. Heavier work will be done in the carpenter's shop Games, swimming and archery fill in odd moments.

specific requests for advice from the Minister, but to review the general development of the Health Service and to study any matter to which, in our opinion, the Minister's attention should be called," limiting itself, however, to matters of broad general policy, and excluding matters for which other machinery has been established The council insists that it is a body of confidential advisers to the Minister, all members serving as individuals and none as delegates In the main, the advice submitted will be published only in the statutory annual report "This does not, however, prevent us from suggesting to the Minister that reports on special subjects might be published or that press notices might be issued announcing that we are undertaking particular lines of enquiry"

The Ministry proposed that there should be ten standing advisory committees medical, dental, pharmaceutical, ophthalmic, nursing, maternity and midwifery, mental health, tuberculosis, cancer and radiotherapy, and child health The council agreed with this proposal, except that it decided to defer setting up a special committee on child health until the problems in this field were more clearly defined

Discussion of the constitution of these committees occupied many months, owing to a difference of opinion as to whether their membership should be exclusively professional

'The debate soon centred round the question whether the Medical, Dental, Pharmaceutical and Ophthalmic Committees should or should not include lay members with local authority, executive council or hospital experience This was an issue on which we ourselves were sharply divided, and when a vote was taken on the membership of the Medical Committee, considered as a test case, only a narrow majority of us was prepared to advise the Minister that the Committee should contain a small element of lay representation When our recommendations following this vote were made to the Minister, he was not able to accept them He considered that he should normally be able to look to these four Committees for purely technical advice and that questions affecting the Medical, Pharmaceutical, Dental and Ophthalmic services as a whole should be discussed in full Council or in special Committees of the Council We therefore acquiesced, although two of our members felt it necessary to register their dissent"

The first advisory committee met on Feb 28, 1949, and by April 29 all had held their first meeting The council's relation to these committees is probably without parallel

The committees are independent statutory bodies which may submit advice direct to the Minister, if they do so, they must send copies of their report to the council, which may express its views thereon Normally the committees receive their remits direct from the Minister, and then they report direct to the Minister Where the report deals with issues beyond the service with which the particular committee is concerned, the council normally expresses its view and for wards this to the Minister The Minister has undertaken not to act, except in an emergency on the report of any standing advisory committee before the council has had a chance to express its views

The committees can also act as if they were committees of the council, and the council can remit matters to them, in this event the report must be sent back to the council A Committee may, of its own volition, send a particular report to the council rather than to the Minister if it feels that the council may wish to consider its wider implications

Thus "it has been accepted that the Council should act as a pivot for all the Committees, that it should ensure that similar procedures are adopted throughout, and that there is due coördination between the work of the Committees, so that the central advisory system of the National Health Service works as a whole and not as a number of disjointed parts offering unrelated advice to the Minister"

THE COUNCIL'S WORK

The council met first on July 27, 1948, and the Minister of Health, in a statement published with the report, remarks that since then he has remitted some thirty questions for consideration by the council and the Committees, while these bodies have volunteered advice on more than a dozen further matters Many of these reports have already been acted on

Health Centres—The council's committee on health centres, "realises that for some time the economic condition of the country will make it impracticable for there to be any widespread provision of health centres with accommodation, equipment and staff of ideal standard" It proposes, therefore, to include in its report (which will be concerned only with centres in urban areas) a section giving practical advice on what could be done now, including particulars of the minimum requirements of types of health centres which could be provided notwithstanding present circumstances The committee recommended that doctors practising at health centres should be permitted to treat private patients there, and effect was given to this recommendation in the schedule to the amending Act of 1949

Hospital Administration—In December, 1949, the council's committee on hospital administration advised the Minister that he should "invite the King Edward's Fund and the Nuffield Trust to undertake a complete unit costing of a small number of representative London and Provincial hospitals" This recommendation has been accepted, and these two bodies have been approached

Prescribing—A joint subcommittee of the councils for England and Wales and for Scotland have reviewed a large number of substances, classifying them according to whether they were primarily foods or medicines, the aim being, in general, to eliminate prescription, under the service, of substances which are primarily nutritional.[2] This committee is now considering toilet preparations, disinfectants, and antiseptics Another joint subcommittee has reviewed the desirability of restricting the prescription of preparations which are extremely expensive or of doubtful value[3]

Pressure on the Hospitals—In the summer of 1949 the Minister was advised that an emergency bed bureau should be set up for each appropriate area, and this is now being done

Integration—Referring to coordination between the various branches of whole service, the council remarks that the time has come when this problem "should be considered as a whole and not in relation to separate services We have therefore asked the other committees concerned not to submit any advice to the Minister on this matter for the present and we propose to consider during 1950 what advice should be formulated on this subject"

ADVISORY COMMITTEES

Medical—This committee has been mainly preoccupied with problems of hospital congestion, the treatment of the elderly chronic sick, and prescribing

Dental—The standing dental advisory committee has advised the Minister that the extension of training facilities for chairside assistants should be encouraged It has also accepted the Minister's invitation to cooperate in assessing the results of the experiment which has been begun in the training of oral hygienists, and a mission has visited New Zealand to obtain first hand information about the work and training of dental nurses in that country

Nursing—This committee has laid down criteria for the employment of young persons in hospitals[4]

The views of these and other advisory committees have been reflected in directives issued from time to time by the Ministry

2 See *Lancet*, 1950 i 983
3 *Ibid*, July 8, 1950 pp 59, 66
4 *Ibid* 1950 i 965

Instruction in archery

first see the place The Station Headquarters is another separate building adjoining the medical block

The living quarters of the NCOs and airmen staff, and NCO patients, lying across the road from the main gates of the unit, must provide another shock The R A F -blue corridors are lined with small dormitories where each of the three or four well sprung beds has its own head light, and every man has his wardrobe locker, with shelves, hanging space, and mirror Some of these quarters were designed for W R.A F (who are not, unfortunately, to enjoy the advantages of them), and the men who occupy these rooms get the added refinement of a long mirror each and modestly private bathrooms

The dining rooms have stout plain tables and beautifully made wooden chairs designed to stand hard wear and yet to please the eye The kitchens have every modern device, far beyond any housewife's hopes in this age and country The charming window curtains differ in every block, and like the slight but lively decorations, can hardly fail to have their own effect on health and spirits The sergeants have better quarters than the airmen, and the officers better quarters than either, after the well established Service tradition, but when all is so good there is very little in it

A mood of comradeship, well being, and enthusiasm for "getting better" is part of the place It began during the darkest days of the war, at the Rehabilitation Centre at Loughborough, and was handed on to Mongewell Park, which has now closed down Most of the staff and original patients of Headley Court came from Mongewell, and they brought this spirit with them The R A F have a well founded reputation for liking the best of everything and seeing that they get it The new unit conforms handsomely to this oldest custom of the youngest Service

Public Health

Poliomyelitis

NOTIFICATIONS of poliomyelitis in the week ended July 1 numbered paralytic cases 124 (104), nonparalytic cases 36 (38) Figures for the previous week are shown in parentheses There has been a small rise in notifications in the country as a whole, but the main centre of high prevalence is still in the Birmingham region This year the disease seems to be following the epidemiological pattern of 1938 rather than that of 1947 or 1949

Composition of Ice-cream

The Food Standards Committee has proposed an interim standard of composition for ice-cream of 5% fat, 10% sugar, and 7½% milk solids other than fat The committee maintains that the standard should be progressively improved as ingredients become more plentiful, and that in the long term the description "ice-cream" should be restricted to a dairy preparation containing a high proportion of milk solids

School Medicine in France

In 1793 a decree of the new Republic of France contained the germ of a school medical service, but it was not until an order made in 1887, under a law of 1886, that much growth came from it This order prescribed the provision of medical inspectors for public and private schools, whose duties were to survey the health of the children—"La salubrité des locaux et l'observation des règles de l'hygiène scolaire." This can be compared with our Educational Provisions Act of 1907 which introduced school medical inspection and established school medicine in Britain as a State function

The growth of school medicine was different in the two countries owing to the difference in their systems of local government In France the local authorities and towns have much greater powers than our county and borough councils in deciding what laws and orders of the central government they will enforce In consequence, the practice of school medicine and of public health developed unevenly in the various units In 1930 a study-group of the Health Organisation of the League of Nations visited France to explore public-health administration, in some districts this was as complete as it could be, while in others it scarcely existed

In 1945 the practice of school medicine was made obligatory, and its principles were defined on a national basis. From then until 1948 the practice of school medicine in France was in most respects similar to that in Britain, but it was in advance of British practice in that the school doctors were concerned with the health of teachers, and had much better means of controlling tuberculosis, and the Académie Nationale de Médecine was entrusted with the working of the service and with the supply of personnel, or at least its approval By a decree of September, 1948, the powers of the Academy were withdrawn, and—apparently in the interests of national economy—administration of the service reverted to the departments

Considering the difficulties of the times, the results achieved between 1945 and 1948 were highly satisfactory, and Dr Auguste Robert[1] inspecteur-général honoraire de l hygiène scolaire et universitaire has spoken for the many doctors and others who wish to see central administration restored The Commission d'Hygiène de l'Enfance has claimed that the organisation set up between 1945 and 1948 was unequalled throughout the world, and has protested that it was suppressed by a stroke of the pen and without the smallest justification[2]

School medicine owes much to France, and it is exasperating for a country which was in the van to be thus hampered

1 Robert, A *Arch Méd soc* July 1949
2 Ribadeau Dumas *Bull. Acad Méd Paris* 1949 133, 629

Infectious Diseases in England and Wales

Disease	Week ended June			
	3	10	17	24
Diphtheria	45	73	51	39
Dysentery	454	353	351	213
Encephalitis				
Infective	6	4	7	4
Postinfectious	—	1	1	1
Food poisoning	117	191	206	664
Measles excluding rubella	10 078	10 732	8857	9088
Meningococcal infection	36	42	39	36
Ophthalmia neonatorum	29	47	40	43
Paratyphoid fever	5	7	9	9
Pneumonia primary or influenzal	458	481	431	344
Poliomyelitis				
Paralytic	27	61	77	104
Non paralytic	10	18	16	38
Puerperal pyrexia and fever	63	85	85	78
Scarlet fever	1158	847	850	974
Smallpox	—	—	—	—
Typhoid fever	3	9	6	13
Typhus fever	—	1*	—	—
Whooping-cough	2613	3446	3649	3746

* Imported case not louse borne

Training groups in the exercise hall

PURPOSES OF THE UNIT

Though most of those admitted are recovering from injuries, a few have medical conditions

The official opening by the Duchess of Kent took place on July 3 and the unit is now ready to receive its full complement of 50 officers and 50 air crew N C O s No distinctions of rank are made in the classes though both the officers and the sergeants have separate messes and living quarters from lower ranks

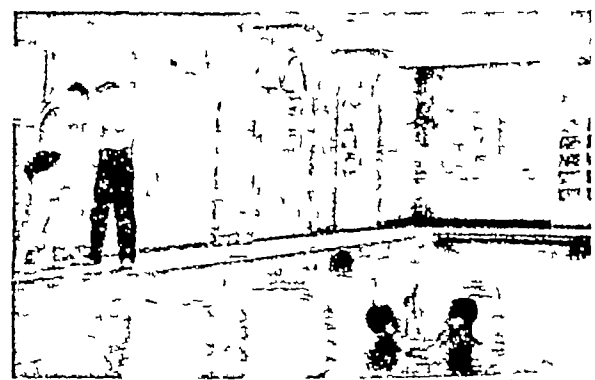
The senior medical officer's staff at present includes, besides the officers already mentioned, a welfare officer responsible for occupational therapy, and also for arranging entertainments for the patients (including free tickets

Exercises for individual cases

for London theatres) 5 physiotherapists (3 R A F senior N C O s and 2 civilian women), a radiographer and photographer, a visiting dental officer, a nursing sister with 2 non-commissioned officers and 4 orderlies to help her, and 2 senior N C O s and 2 clerks responsible for administration and stores

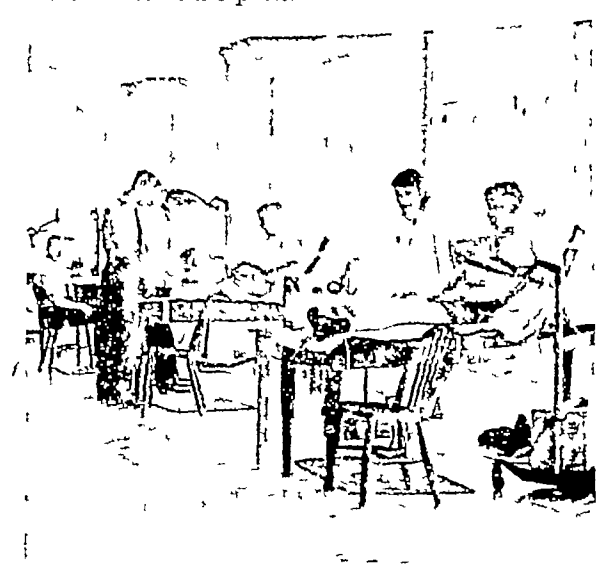
THE SETTING

So much for the people, the quarters in which they work are nearly as remarkable At the end of the war, the Chartered Auctioneers and Estate Agents Institute decided that they wished to give a reablement centre to the R A F, and collected a fund of £150,000 With this they bought Headley Court, a comfortable solid house, built in 1900 and beautifully fitted in many of the rooms with old panelling taken from ancient houses This has become the officers' mess for staff and patients Round it have now been placed a harmonious group of buildings which house the exercise hall swimming bath, physiotherapy and occupational therapy departments, the administrative offices, the dental surgery, and the X ray room and dark room All the medical buildings were the gift of the Chartered Society, while the R.A.F added the administrative block and the living quarters for the patients The architect has made all the buildings graceful and unpretentious outside, and gay inside, with colours used cleverly but sparingly for decoration on the light walls The swimming bath is a charming place, a great flight of broad steps spanning the whole width and leading down to the bottom of the water Here the poliomyelitis patient, or those with stiffened joints, guided by an instructor can do waterborne exercises by the hour together for the water is kept at 90°F in winter and 80°F in summer The exercise hall—with panels of glass brick in its walls, beautifully fitted floor, patterned ceiling, semilunar platform, and musicians' gallery—is almost too beautiful for use The gallery looks down from a second smaller exercise hall on the first floor Along one side of the main hall runs the physiotherapy



Re education of muscles in the swimming pool.

department, fitted with couches and all the appropriate modern accoutrements, its long wall of windows opening on a terrazzo court used for open air exercises Two small wards, beautifully equipped, are near it, with beds enough for those who need any special nursing on admission The occupational therapy department and the carpenter's shop lie at the other end of the block The medical administrative block, which also houses the dental surgery and the X ray department, is separate from the treatment block, and the two lie parallel to each other in a riotously blooming rose garden from which an alley of fancifully cut yews leads the eye down a gentle slope to an endless stretch of country No wonder some of the patients are taken aback when they



In the physiotherapy department.

means This is a very imaginative and enterprising scheme by the local people responsible and I am examining it with great interest

Medical Distinction Awards

Colonel MALCOLM STODDART-SCOTT asked the Minister how long the committee which dealt with merit awards for medical consultants had been sitting, how many times it had met who was its chairman and the salary or fee he had been paid—Mr BEVAN replied The committee was appointed on Dec 23, 1948 It has held 24 meetings Its chairman is the Lord Moran of Manton He has received 3000 guineas for the first year s service and will receive 2500 guineas for the second year

B C G Vaccination

Dr CHARLES HILL asked the Minister how many local health authorities were in possession of adequate supplies of B C G and whether he was satisfied that this method of prevention was being made available on an adequate scale and as rapidly as the paramount necessity of preventing tuberculosis demanded.—Mr BEVAN replied 116 out of 145 authorities in England and Wales have so far had arrangements approved for B C G vaccination at the discretion of chest physicians They receive the vaccine as they need it since it cannot be stored As to the second part of the question I would refer to the reply I gave on June 15 [see *Lancet* June 24 p 1174]

Home Treatment of the Tuberculous

Dr HILL asked the Minister whether he would instruct regional hospital boards to arrange for the home treatment of tuberculosis patients for whom there were no sanatorium beds vacant by making available to them in their homes the services of chest specialists, portable X ray facilities and any other facilities necessary for adequate and continuous treatment—Mr BEVAN replied It is part of the normal work of the boards' chest specialists, with the resources of the hospital service available to them, to take part in the home treatment of tuberculosis patients

Efficacy of Disinfectants

Dr HILL asked the Minister if he would consult the Medical Research Council with a view to taking steps to ensure that disinfectants produced by manufacturers satisfied minimum standards of efficacy—Mr BEVAN replied I am already in touch with the Medical Research Council but as the hon. Member is aware this is a very difficult and technical subject

Dr HILL Will the Minister bear in mind, in any consultation he has that there is a wide difference between the effectiveness of the various disinfectants on the market which is unknown to purchasers and that there is an important public health problem involved ?—Mr BEVAN That is the reason why we have asked the technical authorities to lay down standards, but although this matter has now been pursued for very nearly five years no standards have yet been achieved because of the intricacy of the problem

Supply of Aural Aids

Replying to questions about delays between the time of testing and the time of issue of hearing aids Mr BEVAN said the waiting period varied much according to individual needs and averages had no meaning The mechanical genius available in this country had been used to tackle this problem for the first time in English history Between 80 000 and 90 000 aural aids had already been issued The limitation was not the mechanical genius of the country because we were producing them from the industry faster than technicians could give them to the patients

Mr SOMERVILLE HASTINGS Am I right in assuming that it was the genius of the Post Office engineers which was mainly responsible for this wonderful instrument ?—Mr BEVAN It was the coöperation between the physicians on the one hand and the Post Office engineers on the other that produced this aural aid

Hospital and Specialist Services

Mr HASTINGS asked the Minister what would be the approximate annual saving to the nation if only whole time medical officers were employed under Part II (Hospital and Specialist Services) of the National Health Service Act, 1946—Mr BEVAN replied I regret that the information is not available

Mr HASTINGS Am I right in assuming that there will be a saving of about 20%, and if so will the Minister communicate this to the boards of governors when they are reappointing officers in future ?—Mr BEVAN As I do not know what the figures are, I cannot say whether 20% is accurate or inaccurate

Mr HASTINGS asked the Minister what steps he took to ensure that part time medical officers engaged under Part II (Hospital and Specialist Services) of the National Health Service Act, 1946, were actually employed for the number of notional half-days for which they were paid—Mr BEVAN replied It is the responsibility of hospital boards and committees to see that officers carry out the duties for which they are remunerated

Mr HASTINGS Is the Minister aware that some officers are paid for sessions for which they never turn up ?—Mr BEVAN I should like to have information as to that, because it seems to me rather extraordinary

Dr HILL Will the Minister resist such general allegations without a shred of evidence being produced in their support ?—Mr BEVAN As I said I should like to see the precise information

Clinical Assistantships

Mr READER HARRIS asked the Minister if he was aware that regional hospital boards had not yet begun to offer clinical assistantships to general practitioners, and what action he proposed taking—Mr BEVAN replied I know that appointments of this kind have been offered where the needs of the service demand it If the hon Member has any particular case in mind I shall be glad to hear of it.

Mr HASTINGS Does the Minister realise how important it is from everybody s point of view to keep general practitioners in close contact with their local hospital ?—Mr BEVAN I am very well aware of that and part of the difficulty is to try to bring about a reconciliation between the conflicting claims of the general practitioner on the one hand and the specialist on the other

Cortisone

Mr BARNET JANNER asked the Minister whether he was aware that Cortisone had been made available for its first widespread distribution to United States hospitals and whether any action was being contemplated for its use in United Kingdom hospitals—Mr BEVAN replied I am aware that the production of cortisone in the United States has been increased Clinical trials are being conducted in this country by the Medical Research Council and the results of these trials will determine the conditions for which the drug is made available here

Employment of Epileptics

Mr SOMERVILLE HASTINGS asked the Minister of Labour what provision he had made for the employment of manual and clerical workers who suffered from epilepsy but were otherwise capable of taking their normal part in industry—Mr GEORGE ISAACS replied Sufferers from epilepsy, like other handicapped persons, can readily get advice and guidance about their employment difficulties from disablement resettlement officers who have been able by special approach to employers to place a considerable number in suitable employment To assist in this work explanatory notes about epilepsy have been issued by my department to employers for their information and guidance A number of the more severe cases have been placed in employment under sheltered conditions in Remploy factories

Motor-cars for District Nurses

Mr A C MANUEL asked the Secretary of State for Scotland what information he had as to the progress made by the local authorities since they became responsible for the nursing service in the provision of motor-cars for district nurses—Mr H. McNEIL replied During 1949 100 additional cars were provided for nurses engaged in home nursing services Of the 908 nurses so engaged in county areas at the end of 1949 586 had cars at their disposal.

Parliament

Entry to General Practice

Dr A D D BROUGHTON took the opportunity of speaking on the Adjournment, on July 7, to bring to the notice of the House and the Minister of Health the difficulties facing doctors who want to enter general practice as partners or principals The old method of buying practices, he said, often plunged a young man into debt for twenty years, and the abolition of the sale of practices might have been expected to make it easier for young men and women to enter this important field of medical work They do, in fact, find comparatively little difficulty in getting assistantships, but most of them, particularly the ambitious ones, after a period of assistantship want the greater security to be gained as a partner or principal

Vacancies for medical practices are advertised by executive councils, but the advertisements are surprisingly few In the *British Medical Journal* of July 7, he said, there were only 3 such advertisements A practice with a list of reasonable size when advertised can attract more than 50 applicants Thus, men in their thirties, married, and some of them with young families, men who served during the war, with good qualifications and considerable experience, including general practice, find themselves unsuccessful applicants, and after several failures some of them begin to feel a sense of inferiority The majority, however, blame the executive councils, and claim that 90% of the appointments are "fixed" While Dr Broughton did not share that view, he said he could readily understand a man being driven to believe it

The difficulties of entering general medical practice by means of executive council appointments are so great that most medical graduates try to enter as partners with established practitioners But all too often they find themselves up against what Dr Broughton said can only be called a racket While a principal can no longer sell the goodwill of his practice, there is nothing to prevent him insisting that the partner shall occupy a certain dwelling-house, and no limit is fixed to the price he can charge for it Thus one doctor who answered an advertisement for a partnership received no reply from the doctor, but a house-agent wrote to say that the partnership was conditional upon the applicant's purchase, as a place of residence, of a small bungalow for £6500 Further, during the first three years of the partnership, additional expenses would have to be incurred to the amount of £2500, making the total £9000 Is it right, Dr Broughton asked, that young men or women wishing to start in general medical practice should be burdened with a debt of that size? Not all doctors are trying to rob new entrants in this manner, but he believes that far too many of them are doing so We are short of doctors, and particularly of general practitioners, but it is still far more difficult than it should be for men and women to gain a foothold in practice

Dr BARNETT STROSS found this problem none the less disturbing because the evidence of it may be confined to a very few examples Even if one such distressing case occurs in a year something should be done to make such things impossible Seeing that the Minister has paid some £66 million for the goodwill of general medical practices, Members of Parliament never expected that practices would be sold again in the way described If in a back-handed way a medical practice is to be sold twice that, he suggested, is surely illegal He quoted section 35 (3) of the Act, which debars the sale of premises used for practice at a price above the fair market price The same should apply, he thought, to the doctor's dwelling house, for those who have worked in general practice know that it is not only the surgery but the place where one lives which counts

Mr ARTHUR BLENKINSOP, parliamentary secretary to the Ministry of Health, agreed that, though only a few cases may be affected in the way Dr Broughton had described, the Government's wish is that the opportunities for young men to come into medical practice should be made more, rather than less, plentiful The reduction of the maximum number of patients on a doctor's list has encouraged general practitioners to employ extra assistants or bring new partners into their practice The executive councils have defined and classified different parts of the county as underdoctored or overdoctored areas, thus encouraging newcomers to concentrate their attention on parts of the country where more medical care is needed They have also done their best to persuade doctors to take on assistants or to enter into partnerships so as to increase the medical services in underdoctored districts The Medical Practices Committee, in their first report, stated that, in their view, preliminary apprenticeship as an assistant is still the best method of entry into general practice The Government shares that opinion and has encouraged the appointment of assistants by giving grants. Some increase in the number of assistantships has been seen over the country as a whole There is much greater opportunity today for entry into general practice by merit, Mr Blenkinsop claimed, than there was under the old system While there has been criticism of particular appointments, the procedure adopted by the executive councils has on the whole brought little complaint, and has been widely regarded as a desirable method of appointing new practitioners The building up of new practices is being encouraged by the payment, in many cases, of a basic salary of £300 a year, and by means of the Special Inducement Fund, on which claims can be made by doctors setting up practice in particularly difficult and underdoctored areas

The Government appreciates, however, that there are still very real difficulties, among them the problem of accommodation, to the young doctor Sometimes a doctor appointed by an executive council cannot accept the appointment because another doctor has already secured the use of the surgery on the outgoing doctor's premises If any excessive price is being charged for a house which includes the surgery it is an attempt to evade the provisions of the Act, and should be reported to the Medical Practices Committee Where the house is separate from the surgery the position is rather more difficult to define The matter is largely one of professional conduct in which the Government would hope to get the coöperation of the profession itself in insisting that this kind of conduct should be condemned They would wish to gain the coöperation of the British Medical Association in trying to ensure that this practice should be ended by the voluntary action of the practitioners themselves It might be rather difficult to interpret the Act in such a way as to cover the ordinary living accommodation of a doctor if it is quite distinct and separate from the surgery But he is prepared, he said, to examine the matter further The difficulty some doctors find in taking up practices to which they have been appointed, because of lack of accommodation, is already being discussed with the B M A, and he hoped that a way will be found to overcome this trouble The Government is most anxious to try to help in every way it can to encourage the setting up of additional medical practices.

QUESTION TIME

Mentally Deficient Children

Mr W R S PRESCOTT asked the Minister of Health how many mentally deficient children were awaiting admission to institutions, what were the comparable figures at the same date for 1947, 1948, and 1949, and what steps he was taking to expedite admission—Mr A. BEVAN replied Figures in regard to mentally defective children are not separately shown Within the resources available we are of course, adding to the accommodation available I am quite aware of the seriousness of the problem, and if we could make more accommodation available I would be delighted

Hospital Transport Scheme

Mr SAMUEL STOREY asked the Minister if he had considered the report of the West Manchester Hospital Management Committee upon their transport scheme for industrial workers attending hospital outpatient department, and whether, in view of the saving of man hours to industry achieved, he proposed to extend the experiment to other areas—Mr BEVAN replied I am arranging for a report on this scheme to ascertain whether equal savings could be secured by other

hich my assailant could not face Encouraged by this iccess I put up a barrage to cover my daughter s etreat to the other bank, and a somewhat more accurate arrage from two small boys, who welcomed the opportunity with glee, did the same for your somewhat battered orrespondent, now incapable of vision from his right ye For a week to come I received solicitous inquiries s to how I came by such a wonderful black eye The rm bruises being deeper were more slow in showing but mpressive

I still do not know whether a swan can break a man s arm with a blow of his wing, but I am entirely convinced hat the bather should avoid the cock swan who is oppressed by family cares

* * *

The peripatetic first-aid examiner (July 1) was unlucky in his viva candidates I remember one particular session because five successive examinees answered my question on the treatment of gastric hæmorrhage by rattling out parrot fashion "oyster soup' This was at Birmingham and as I was a Scot, I did not realise the intended answer was "ice to suck' I was pleased with this little misunderstanding just as I had been puzzled by the local delicacy which seemed to cause so many bellyaches to be called 'unfidum," translated as home fed ham'

Of course I related my examination experiences in the mess never thinking it would appear in *The Lancet* years later in an article on 'Hints to M R C P Candidates,' but the story had changed slightly in the interval The scene was now an M.R C P viva The examiner asked my question, the poor candidates recommended the same soup The examiner solved the conundrum by discovering that the candidates had all attended a cram class run by a Scotsman where there had been a bit of difficulty over his accent

The *Times* fourth leader the other day discussed the birth of jokes and anecdotes, and wondered where they started I know where this one started and I am still proud of my child, although it is a bit of a changeling

* * *

As one of Mackintosh s diverted diploma graduates,[1] at present peripatetically covering miles and miles in the relentless brilliance of Africa, may I send this titbit of tropical hygiene?

We met several tsetse control posts in Portuguese East Africa and some in Nyasaland and the procedure was roughly the same in each. We drove the car into a sort of garage shed, with doors at both ends and a thing that might have been a fume cupboard at the side. The doors were shut and an African solemnly sprayed us here and there with a 'Flit' gun—we formed the impression that tsetse only fly in a band 3–4 ft from the ground Then there was a pause for about 2 or 3 minutes, after which either the spraying was repeated or the door opened and we were freed This interesting ritual took place several times we never knew whether we were entering or leaving the infested area In Nyasaland the procedure was still further simplified The African in charge informed us that as it was after 6 P.M. their post had stopped work and we could go straight through. Evidently tsetses keep trade-union hours

* * *

After moving the patient into a better light I sat down to await what I expected would be a perfectly normal delivery Nor did I have to wait long Very soon the vertex peeped out shyly and was crowned, then the head was completely delivered and it was fully extended immediately afterwards The thorax followed quickly, and the legs were born and waved feebly in the air Next there was half an hour of apparent inertia without further progress There seemed to be some difficulty in delivering the aftercoming abdomen, and I began to get worried. I had never seen or read of such a thing before and did not know what to do There was no obvious distress, so I refrained from interfering (apart from testing an occasional reflex) and allowed nature to take its course. And rightly, for suddenly the abdomen slipped out easily, and the dragon-fly promptly reversed its position and began to dry its wings

1 See *Lancet* 1950 i 934 1019

Letters to the Editor

THE REGISTRAR'S PLIGHT

SIR,—The "registrar problem," discussed in your leading article of June 24, cannot easily be solved without either unfairness to the registrars or detriment to the hospital services If the present number of registrars is maintained it is certain that many will be unable to obtain consultant posts, and it is hard to know how they can then be employed usefully and contentedly and without wasting their special training If as seems likely, the number of registrar posts is drastically reduced, the hospital services will become less efficient Much of the very necessary work now being done by registrars cannot be done well by less experienced people and a compensatory increase in the number of consultants does not seem likely at present

The eventual number of registrar posts will probably be estimated by predicting the consultant vacancies likely to be open in the future with allowance for some registrars who drop by the wayside and for others who will eventually go abroad or into the Armed Forces The smaller number of registrars so arrived at will almost certainly be inadequate for the amount of work that is to be done The gap could be at least partly filled by taking on as registrars more postgraduate students from abroad, many of whom have hitherto been discouraged by the difficulty of getting worth-while hospital appointments in this country There are already many such people in Britain, eager for work and experience and if the jobs were available there could be more Most of them have commitments or prospects at home, and few would likely remain to compete for consultant vacancies here

It is time for a planned policy of postgraduate medical training based on the needs of the world community and the contribution which this country in particular can make The present trend, unfortunately, is to pander to the demand for multiple higher qualifications by organising longer and drier didactic lecture courses as preparation for more and more complex examinations As similar amenities are now available in the Dominions and elsewhere fewer students are likely in the future to come to Britain for these inducements alone It is not wholly appreciated here that Britain's greatest single attraction to postgraduate students from less thickly populated countries is the concentration of clinical material to be studied and the vast bulk of work to be done in British hospitals If this asset can be used to the full in postgraduate teaching Britain s future as a world medical centre will become much more certain It is to be hoped that the final establishment of registrar posts is not set too low until this possibility has been thoroughly explored and a broad policy decided upon to which the Ministry, the Royal colleges, and the universities could all contribute to their mutual advantage

Aberdeen. D. B STEWART

CEREBELLAR SYNDROME FOLLOWING SODIUM AMYTAL

SIR,—I was much interested in Dr Bodman's observations last week on cerebellar effects following administration of 'Sodium amytal,' and would like to mention some observations of my own These are recorded in my article on the anæsthesia of rabbits in the UFAW handbook on the *Care and Management of Laboratory Animals* (London 1947)—an article that was written in 1944–45

Of rabbits anæsthetised with intravenous 'Nembutal' (sodium iso-amytal) or 'Evipan' (hexobarbitone), a fairly large proportion showed some degree of nystagmus, often quite slight, but sometimes very marked indeed, with synchronous nystagmoid movements of the whisker or even of the whole head On at least one occasion

Pneumoconiosis in South Wales

Mr DAVID WILLIAMS asked the Minister of Fuel and Power how many miners in South Wales had continued their underground employment after being certified to be suffering from pneumoconiosis.—Mr PHILIP NOEL BAKER replied: On Dec. 31, 1949, 2372 men who had been given an assessment in respect of pneumoconiosis under the Industrial Injuries Act, 1948, were employed underground in the South Wales coalfield.

Quarantine Medical Certificates

Major HOWARD JOHNSON asked the Minister of National Insurance whether she was aware that a certificate given by a general medical practitioner placing a person in quarantine could not be accepted for a benefit claim, and, in view of the fact that this cast a slur upon such a practitioner, whether she would amend the National Insurance (Unemployment and Sickness Benefit) Regulations in this respect.—Dr EDITH SUMMERSKILL replied: The medical officer of health is responsible for action to prevent the spread of infectious disease, and it is in accordance with the recommendation of the National Insurance Advisory Committee that he is also the authority for the issue of insurance certificates in these cases. This implies no slur on general practitioners and I see no reason to alter the present provision.

Medicine and the Law

The Wrong Bottle

AT an inquest in Blyth last month the evidence showed that a woman, aged 23, had died through the inadvertent use of potassium citrate in an injection.

A staff nurse with over twenty years' experience explained to the coroner that, when working at a clinic, she noticed that her flask of distilled water was almost empty. She took it upstairs and asked an orderly to refill it; she held the flask while he filled it; she did not particularly notice the bottle which he used. On the doctor's instructions she had to prepare two injections for a patient. For the second injection she filled a syringe and handed it to the doctor, assisting him while he injected the contents into the patient's arm. The patient, sitting in a chair, slumped forward and collapsed. Attempts at artificial respiration failed and death followed.

The jury returned a verdict of death from misadventure.

The Duty to Inform the Coroner

At another inquest last month the resident surgical officer gave evidence that a woman was admitted to a Surrey hospital with general peritonitis. An operation was conducted but nothing obvious was found to account for her condition; she died two days later. At a limited necropsy an object was discovered which he at first thought was a piece of bamboo; it was suggested that it was the bone of a skate. He signed a death certificate.

The coroner commented that the death certificate was useless; no registrar would have accepted it; it meant that there was considerable delay before he himself was informed and considerable difficulty in carrying out a further necropsy. The pathologist who gave evidence of this further examination said that he was unable to decide the cause of death because the body had been treated with embalming fluid; he thought the splinter looked like vegetable fibre of some sort. The coroner stated that death obviously resulted from perforation of the bowel by an object 3 in. long and pointed at both ends; "it may possibly be a fish bone, but I doubt it." He told the resident surgical officer that he should have informed the coroner's officer forthwith as soon as it was known that death was not due to natural causes. "You seem," he said, "to have done a number of things which do not commend themselves to me." A verdict of accidental death was recorded.

In England Now

A Running Commentary by Peripatetic Correspondents

BLOODSHOT

Wintrobe O'Landsteiner Wiener FitzKahn
Lay in his lab on a satin divan
And sipping his saline he passed in review
The things he had almost decided to do,
Like writing his thesis on "Proof of a Theorem
Disproving that Serum is Plasma (or Serum)"
He thought of the days in the dawn of his youth
When, asking no more than Pursuit of the Truth,
With lenses all dirty and eyepieces scratched,
He counted corpuscles before they were hatched,
And many a time made a clear diagnosis
Of Multiple Red-cell Erythrocytosis
(He turned to a female technician and beat her
Until she remembered the height of the tiire
He bade her get up and go dance a pavane
For Wintrobe O'Landsteiner Wiener FitzKahn)
Landsteiner Wintrobe O'Kahn de MacWiener
Arose and announced with unruffled demeanour,
"My private researches have recently shown
A way by which blood can be drawn from a stone
And pure inexhaustible rivers of gore
Extracted from crude sanguiniferous ore"
"This tide of affairs we shall take at the flood
And pluck off the leeches whb live on our blood—
Agglutinin courses the vessels of men
Remorselessly seeking agglutinogen—
So Fate in fulfilment now fittingly sends
These bloodsucking bleeders to bloodthirsty ends!"
(The sauce for the gander is sauce for the goose,
The pips are as bitter as sweet is the juice—
"That donor will faint e'er he gets any greener"
Said Landsteiner Wintrobe O'Kahn de MacWiener)

* * *

"A swan can break a man's arm with a blow of his wing" thus traditional childhood lore led me and my fellows in my very young days in the Thames Valley to regard these lordly birds with respect and even fear. Increasing stature and experience of the vulnerability of the cock swan to a sharp poke in the neck with an oar or paddle led to modification of these feelings, and for years past I have looked on the swan merely as a pleasant adjunct to the landscape so long as he kept in his right place, and as an easily disposed of nuisance when he didn't. But once again I have had occasion to modify my views.

It was a lovely June day; my daughter and I were exploring, in a punt, a hitherto unvisited reach of river with a view to a bathe. We found the reach ended in a steep weir, and it was easy to slide down its weed covered cement into the mild turbulence of the water at its foot. Fifty yards away was the opposite bank towards which we swam and where we found a pair of swans with a brood of newly hatched cygnets receiving the attentions of a picnic party—a charming sight. I left my daughter admiring it while I swam out into the pool. A shout from the bank made me look round to find the cock bird bearing down upon me—neck feathers ruffled and wings half outspread so as to make him look twice his size, head proudly poised and with a malignant gleam in his beady eyes, viewed from the level of the water he presented a noble and formidable spectacle. My immediate, and quite irrational, apprehension was of the beak in my eyes, and my reaction to shout "shoo" and splash at the downbearing menace. The next moment the air above me was full of wings and I received a blow on the side of the head that knocked me silly. When I was again in a position to observe events I found the malevolent fowl bearing down upon me from another angle. To present my feet to the onslaught and to kick violently seemed sound tactics, but merely resulted in a further whirlwind of wings and a couple of blows on my right arm which numbed it from the shoulder down. The next and subsequent attacks I evaded by diving and swimming under water towards the shallows, and this somewhat ignominous procedure seemed to be the correct tactical answer. Once in the shallows it was easy to heave a few stones in his direction—a threat

to a deep plane of anæsthesia of the shortest possible duration We feel that this method is far easier than the more elaborate intubation methods described, and we are quite sure that many other units use this or a similar method

LESLIE J TEMPLE
Assistant Thoracic Surgeon
T CECIL GRAY
Senior Anæsthetist.
Broadgreen Hospital, Liverpool

A C T H IN RHEUMATOID ARTHRITIS

SIR,—Dr Frank Marsh, in his letter last week commenting on our paper of June 24, suggests that intravenous adrenaline might be more effective than adrenaline given intramuscularly We have treated six rheumatoid patients with intravenous adrenaline by continuous drip over 3–7 days The physiological and therapeutic results have not differed substantially from those obtained by the intramuscular route One of the difficulties connected with the intravenous method is the instability of adrenaline in weak solution, special precautions being required to prevent its rapid deterioration

Postgraduate Medical School of London.
E DRESNER
L G C PUGH

POSTURE

SIR,—In connection with my work on mental handicap, I have always been very interested in the relation between posture and body mechanics When some years ago I became acquainted with the work of Matthias Alexander, to which Dr Barlow refers in your issue of July 1 I tried very hard to understand from his writing what he meant by "primary control." Then, during an interview, he showed me adjusting my head with his hands, the right position of the head in relation to the torso I felt at once that in this position the muscles in the back of my neck, which previously had been strained, became completely relaxed, and head movement could be executed far more freely Asked "why has man lost this 'primary control,' if he once possessed it?" Alexander replied "with the rapid advance of civilisation, instinctive control of the body has not kept pace with man's need," but he was unable to point out actual factors which had led to the loss of primary control

This induced me to investigate the question on my own By closely observing people, I found that whereas Europeans walked about with their heads slightly tilted backwards, Indians whose movements reflected far more ease and grace in walking and dancing, carried their heads in accordance with the "primary control." What was the reason? Then I remembered that peasant girls in southern countries, who carried heavy loads on their heads, balanced them freely, and had the same easy and graceful walk and the same beautiful movements So I started to experiment by balancing things on my head and after realising that they incessantly slipped down my back, I learned to adjust my head and became able not only to carry things whilst walking on a straight floor, but even to walk up and down stairs without dropping them I constantly had to control my head position during the exercise, which I found was identical with the "primary control" position The experiment showed the way to regain the lost control, without any elaborate teaching by devoting a few hours every day to the exercise of carrying things on one's head and trying all day long to keep the head in the same position

But the question still remained "Why have we lost it? and why have these Indians and peasant girls not lost it?" The answer, it seems is quite simple. Peasant girls in southern countries go barefooted during the greater part of the year, Indians do the same, and even if they do not go barefooted they walk in sandals without heels In all the *civilised* societies of the West, children wear shoes, even when learning to walk, and the toddler's shoe has a low heel. The heel is too low to disturb the general balance noticeably, but it nevertheless tilts the whole body very slightly forwards If the child looks straight in front of him, his gaze lands at some distance on the floor instead of going parallel with it To correct this visual handicap, a child whose vision is undisturbed will slightly retract his head to compensate for the forward tilt of the body, because the intervertebral joints move more easily at the neck than at any other part Blind or very short sighted children will of course not adjust their sight and not retract the head. They are therefore constantly admonished to keep their heads erect (which actually means to tilt their heads back)

In my special field of mental deficiency I found that children suffering from visual disturbances and having lost their visual reflexes, do not lose their primary control, and seem always to droop their heads If one gets a heelless shoe for these children, their posture is at once much improved, and their heads do not tilt forwards any more

My experience tends to convince me that the head-neck torso relationship has a significant influence on body mechanics and that Alexander's "primary control" is of great importance in preserving ease and grace of movement I have not formed any opinion as to its influence on disease I have come to the conclusion, that the loss of "primary control" is due to the low heel of a *toddler's* shoe, and therefore originates early in childhood, if the "primary control" is not lost in childhood even a high heel cannot, it seems, destroy it Finally I believe that in adolescence or adult life the acquisition of the *right* head position, and with it probably beauty and grace of movement, can be regained by learning to carry objects on one's head With Alexander, I agree that we have lost a rather important instinctive control, but I disagree with him that such vague reasons as the "rapid advance of civilisation" account for this loss and contend that this is only due to one effect of civilisation—the slight slant of the body created by the heel of a baby's shoe

London W 1
LISE GELLNER

THE MEDICAL BILL

SIR,—Will you permit me, in what I conceive to be the interests of the whole body of medical students, to lay before your readers the manner in which this Bill, unless amended, will gravely injure those interests? The Bill begins this week its vital committee stage in the House of Commons so that if anything is to be done to help this relatively helpless but far from undeserving section of the community it is a case of now or never There are always many thousands of them, and the harm to which I seek to draw public attention affects the future student hardly less than the present one I write in the hope that this statement of simple fact will interest M.P.s (lay no less than medical) and doctors everywhere and that it may do something to convert the benevolent but still rather uncomprehending attitude of the British Medical Association into a vigorous and determined effort on their part to ensure justice at the hands of Parliament

Here, then are the main points at issue Each of them calls aloud for an amendment Expressions of hope or sympathy, assurances, and advice to await regulations or orders are not enough Nothing but actual enactment will avert the danger Once it is plain that there is substance in a point why should not the Act incorporate it at once? Why leave it to a regulation or order?

1 The Bill seriously lengthens the period (already six years) of a student's training, and requires the extra time to be spent—after qualification but before registration—in compulsory resident, medical service in a

the rabbit assumed the typical cerebellar posture with the head drawn right over on to one shoulder In these cases only a single dose of nembutal was given, though this might be repeated in the same rabbit a month later In no case did we observe any lasting effects

London W 1 J W SHACKLE

MULTIPLE-LEAD ELECTROCARDIOGRAMS

SIR,—I am obliged to Dr Josephs for his letter in your issue of June 17 regarding the significance of a broad S in lead I in the diagnosis of right bundle branch block While it is true that in general right bundle branch block curves do show such a wave, the rule is not absolute For example, in a case recently observed here the standard lead curves are those of "common-type" divergent bundle branch block with grossly broadened R and no S in lead I In the chest leads of this patient, V1 shows M shaped initial deflections, with the intrinsic deflection falling 0 12 second after the beginning of R there is thus right bundle branch block In this case a diagnosis based on the standard leads only, and following the rule quoted by Dr Josephs, would have been erroneous

There is no doubt that precordial leads are essential in the accurate diagnosis of bundle branch block curves

Edinburgh IAN G W HILL

TORSION OF THE GREAT OMENTUM

SIR,—Much as I enjoyed reading Mr Rejthar's article of May 27, I cannot agree that the condition is as rare as he suggests Like some other writers on the subject, he mainly quotes articles from abroad while neglecting those at home One of the first articles in this country was by Mr Reginald Vick [1], yet I cannot recall having seen this in any list of references Another contribution rarely quoted is the one by Sir Cecil Wakeley [2] Nearly twenty years ago a paper by myself [3] recorded seven cases, five of them from the London Hospital alone I have no doubt that if the records of this and other great hospitals in London were further consulted, they would yield a goodly harvest of such cases

Nor can I see why torsion of the *whole* of the structure should be insisted upon If classification or specialisation in this particular instance is pushed to extremes, and we confine ourselves to pure intra abdominal torsion of the so-called *whole* of the great omentum, we shall succeed in getting a *rara avis* indeed For instance, pure intra abdominal torsion automatically rules out torsion associated with any abdominal inflammatory lesion The presence of an inguinal hernia renders the condition suspect, even if the appearances are that the hernia has nothing whatever to do with the condition—despite Lockwood's observation that in subjects under the age of 45 it is difficult to bring the omentum down to the level of the pubis

I suggest that there is no such thing as torsion of the *whole* of the great omentum As well might one expect the greater curvature of the stomach to tie itself in knots What in actual fact happens in most cases is that there is a greater aggregation of tissue on the right side of the omentum, with pedicle formation *below* the level of the transverse colon, a condition which renders easy the twisting of the right half of the great omentum Symptoms of torsion become acute when the vessels finally become occluded, and the condition is usually mistaken for acute appendicitis

Like others, I have gone to some trouble to differentiate between acute appendicitis and torsion of the omentum [3], yet twice since then I have diagnosed appendicitis to find instead at operation torsion of the omentum On rare occasions the condition affects the left half of the omentum, as in the case where two accessory spleens were found in the twisted mass, and then pain is felt on the left side

In any event I fail to see why any portion, small or large, of the omentum should be excluded from any particular category of torsion Distinguished surgeons in the past have been led to operate for symptoms arising from torsion of various sized portions of the omentum, but whether the portion be large or small, it is better to operate than allow the part to rot!

London, W 1 MICHAEL SMYTH

1 Vick, R *Brit med J* 1911 i, 622
2 Wakeley C P G *Med Pr* 1929 127 38
3 Smyth M *Lancet* 1930 ii 572

THREAT TO A SMALL GENERAL HOSPITAL

SIR,—St John's Hospital, Lewisham, which has been for nearly seventy years a complete general hospital, serving a population of a quarter of a million, is now threatened with dismemberment This means that St. John's will lose inpatient facilities for six departments of medicine and surgery—gynæcology, dermatology, urology, orthopædics, E N T, and psychiatry—and in addition children's beds are to be reduced by over half. Apart from the elimination thereby of its rôle as a general hospital, its efficiency and ultimate survival is menaced, and the community will be deprived of that free and alternative choice of opinion and treatment which it has hitherto enjoyed This step is at variance with the promise of the Minister and his instructions to the regional board (R H B (49) 132 [1])

This is no isolated threat, but one that confronts many hospitals of similar size throughout the country Such hospitals as St John's have performed useful work to the community because of their completeness. Dismemberment can only be a retrograde step and should be energetically resisted I urge these hospitals to take action before they are destroyed

London W 1 JOHN HOWKINS

GENERAL ANÆSTHESIA FOR BRONCHOGRAPHY IN CHILDREN

SIR,—The correspondence on this subject has aroused considerable interest here

Nearly three years ago, Mr Philip Allison, of Leeds, demonstrated to one of us that when the swallowing reflex was abolished by anæsthesia, if iodised oil was placed in the pharynx it was sucked into the bronchial tree Ever since then the method of bronchography used in this unit for children too young for the operation to be carried out under local anæsthesia, has been as follows

The child is premedicated with atropine only General anæsthesia is induced with open ether on a mask, possibly after preliminary induction with a very small dose of thiopentone, or ethyl chloride, or gas-and oxygen, according to age Anæsthesia is pushed to the point where cough and swallowing reflexes disappear The mouth is then held open and 20 ml of iodised oil is poured in direct from the bottle Sucking noises can be heard as the oil is drawn into the bronchial tree, and we allow the child to take six good breaths before films are exposed No posturing at all is necessary, but better filling is obtained if, towards the end of the induction, carbon dioxide is added—preferably the patient's own Films are taken in an anteroposterior and both oblique directions

Immediately after the exposures, the child is turned upside down—our particular method is to place the child across the shoulder of the person carrying out the bronchogram—hanging from the hips with the head well down Light percussion is carried out over the lung bases and a dish held to collect the iodised oil which trickles back. In fact, a very large part of the oil is so recovered, and the patient remains in this position until coughing commences

We have now used this "drowning" method in approximately 250 cases without mishap, and in every case very good bronchograms have been obtained The secret of success and safety is a very quick induction

1 See *Lancet* 1949 ii 703

to a deep plane of anæsthesia of the shortest possible duration We feel that this method is far easier than the more elaborate intubation methods described, and we are quite sure that many other units use this or a similar method

LESLIE J TEMPLE
Assistant Thoracic Surgeon
T CECIL GRAY
Senior Anæsthetist
Broadgreen Hospital Liverpool

A C T H IN RHEUMATOID ARTHRITIS

SIR,—Dr Frank Marsh, in his letter last week commenting on our paper of June 24, suggests that intravenous adrenaline might be more effective than adrenaline given intramuscularly We have treated six rheumatoid patients with intravenous adrenaline by continuous drip over 3–7 days The physiological and therapeutic results have not differed substantially from those obtained by the intramuscular route One of the difficulties connected with the intravenous method is the instability of adrenaline in weak solution special precautions being required to prevent its rapid deterioration

Postgraduate Medical School of London.
E DRESNER
L G C PUGH

POSTURE

SIR,—In connection with my work on mental handicap, I have always been very interested in the relation between posture and body mechanics When some years ago I became acquainted with the work of Matthias Alexander, to which Dr Barlow refers in your issue of July 1, I tried very hard to understand from his writing what he meant by "primary control." Then, during an interview, he showed me, adjusting my head with his hands, the right position of the head in relation to the torso I felt at once that in this position the muscles in the back of my neck, which previously had been strained, became completely relaxed, and head movement could be executed far more freely Asked 'why has man lost this 'primary control,' if he once possessed it?' Alexander replied "with the rapid advance of civilisation, instinctive control of the body has not kept pace with man's need " but he was unable to point out actual factors which had led to the loss of primary control

This induced me to investigate the question on my own By closely observing people, I found that whereas Europeans walked about with their heads slightly tilted backwards, Indians, whose movements reflected far more ease and grace in walking and dancing, carried their heads in accordance with the "primary control." What was the reason? Then I remembered that peasant girls in southern countries, who carried heavy loads on their heads, balanced them freely, and had the same easy and graceful walk and the same beautiful movements So I started to experiment by balancing things on my head, and after realising that they incessantly slipped down my back, I learned to adjust my head and became able not only to carry things whilst walking on a straight floor, but even to walk up and down stairs without dropping them I constantly had to control my head position during the exercise, which I found was identical with the "primary control" position. The experiment showed the way to regain the lost control, without any elaborate teaching, by devoting a few hours every day to the exercise of carrying things on one's head and trying all day long to keep the head in the same position

But the question still remained "Why have we lost it? and why have these Indians and peasant girls not lost it?' The answer, it seems, is quite simple Peasant girls in southern countries go barefooted during the greater part of the year, Indians do the same, and even if they do not go barefooted they walk in sandals without heels In all the *civilised* societies of the West, children wear shoes, even when learning to walk, and the toddler's shoe has a low heel The heel is too low to disturb the general balance noticeably, but it nevertheless tilts the whole body very slightly forwards If the child looks straight in front of him, his gaze lands at some distance on the floor instead of going parallel with it To correct this visual handicap, a child whose vision is undisturbed will slightly retract his head to compensate for the forward tilt of the body, because the intervertebral joints move more easily at the neck than at any other part Blind or very short sighted children will of course not adjust their sight and not retract the head They are therefore constantly admonished to keep their heads erect (which actually means to tilt their heads back)

In my special field of mental deficiency I found that children suffering from visual disturbances and having lost their visual rèflexes, do not lose their primary control and seem always to droop their heads If one gets a heelless shoe for these children, their posture is at once much improved, and their heads do not tilt forwards any more

My experience tends to convince me that the head neck torso relationship has a significant influence on body mechanics and that Alexander's "primary control" is of great importance in preserving ease and grace of movement I have not formed any opinion as to its influence on disease I have come to the conclusion that the loss of "primary control" is due to the low heel of a *toddler's* shoe, and therefore originates early in childhood, if the "primary control" is not lost in childhood even a high heel cannot, it seems destroy it Finally, I believe that in adolescence or adult life the acquisition of the *right* head position, and with it probably beauty and grace of movement, can be regained by learning to carry objects on one's head With Alexander I agree that we have lost a rather important instinctive control, but I disagree with him that such vague reasons as the "rapid advance of civilisation" account for this loss and contend that this is only due to one effect of civilisation—the slight slant of the body created by the heel of a baby's shoe

London W 1
LISE GELLNER.

THE MEDICAL BILL

SIR,—Will you permit me, in what I conceive to be the interests of the whole body of medical students, to lay before your readers the manner in which this Bill, unless amended, will gravely injure those interests The Bill begins this week its vital committee stage in the House of Commons so that if anything is to be done to help this relatively helpless but far from undeserving section of the community it is a case of now or never There are always many thousands of them, and the harm to which I seek to draw public attention affects the future student hardly less than the present one I write in the hope that this statement of simple fact will interest M.P.s (lay no less than medical) and doctors everywhere and that it may do something to convert the benevolent but still rather uncomprehending attitude of the British Medical Association into a vigorous and determined effort on their part to ensure justice at the hands of Parliament

Here, then, are the main points at issue. Each of them calls aloud for an amendment Expressions of hope or sympathy, assurances, and advice to await regulations or orders are not enough Nothing but actual enactment will avert the danger Once it is plain that there is substance in a point why should not the Act incorporate it at once? Why leave it to a regulation or order?

1 The Bill seriously lengthens the period (already six years) of a student's training and requires the extra time to be spent—after qualification but before registration—in compulsory, resident, medical service in a

the rabbit assumed the typical cerebellar posture with the head drawn right over on to one shoulder In these cases only a single dose of nembutal was given, though this might be repeated in the same rabbit a month later In no case did we observe any lasting effects

London W 1 J W SHACKLE

MULTIPLE-LEAD ELECTROCARDIOGRAMS

SIR,—I am obliged to Dr Josephs for his letter in your issue of June 17 regarding the significance of a broad s in lead I in the diagnosis of right bundle branch block While it is true that in general right bundle branch block curves do show such a wave, the rule is not absolute For example, in a case recently observed here the standard lead curves are those of "common type' divergent bundle branch block with grossly broadened R and no s in lead I In the chest leads of this patient, V1 shows M shaped initial deflections, with the intrinsic deflection falling 0 12 second after the beginning of R there is thus right bundle branch block In this case a diagnosis based on the standard leads only, and following the rule quoted by Dr Josephs, would have been erroneous

There is no doubt that precordial leads are essential in the accurate diagnosis of bundle branch block curves

Edinburgh IAN G W HILL

TORSION OF THE GREAT OMENTUM

SIR,—Much as I enjoyed reading Mr Rejthar's article of May 27, I cannot agree that the condition is as rare as he suggests Like some other writers on the subject, he mainly quotes articles from abroad while neglecting those at home One of the first articles in this country was by Mr Reginald Vick [1], yet I cannot recall having seen this in any list of references Another contribution rarely quoted is the one by Sir Cecil Wakeley [2] Nearly twenty years ago a paper by myself [3] recorded seven cases, five of them from the London Hospital alone I have no doubt that if the records of this and other great hospitals in London were further consulted, they would yield a goodly harvest of such cases

Nor can I see why torsion of the *whole* of the structure should be insisted upon If classification or specialisation in this particular instance is pushed to extremes, and we confine ourselves to pure intra abdominal torsion of the so-called *whole* of the great omentum, we shall succeed in getting a *rara avis* indeed For instance, pure intra abdominal torsion automatically rules out torsion associated with any abdominal inflammatory lesion The presence of an inguinal hernia renders the condition suspect, even if the appearances are that the hernia has nothing whatever to do with the condition—despite Lockwood's observation that in subjects under the age of 45 it is difficult to bring the omentum down to the level of the pubis

I suggest that there is no such thing as torsion of the *whole* of the great omentum As well might one expect the greater curvature of the stomach to tie itself in knots What in actual fact happens in most cases is that there is a greater aggregation of tissue on the right side of the omentum, with pedicle formation *below* the level of the transverse colon, a condition which renders easy the twisting of the right half of the great omentum Symptoms of torsion become acute when the vessels finally become occluded, and the condition is usually mistaken for acute appendicitis

Like others, I have gone to some trouble to differentiate between acute appendicitis and torsion of the omentum [3], yet twice since then I have diagnosed appendicitis to find instead at operation torsion of the omentum On rare occasions the condition affects the left half of the omentum, as in the case where two accessory spleens were found in the twisted mass, and then pain is felt on the left side

In any event I fail to see why any portion, small or large, of the omentum should be excluded from any particular category of torsion Distinguished surgeons in the past have been led to operate for symptoms arising from torsion of various sized portions of the omentum, but whether the portion be large or small, it is better to operate than allow the part to rot!

London W 1 MICHAEL SMYTH

1 Vick R. *Brit med J* 1911 i, 622
2 Wakeley C P G *Med Pr* 1929 127 38
3 Smyth M *Lancet* 1930 ii 572

THREAT TO A SMALL GENERAL HOSPITAL

SIR,—St John's Hospital, Lewisham, which has been for nearly seventy years a complete general hospital, serving a population of a quarter of a million, is now threatened with dismemberment This means that St John's will lose inpatient facilities for six departments of medicine and surgery—gynæcology, dermatology, urology, orthopædics, E N T, and psychiatry—and in addition children's beds are to be reduced by over half. Apart from the elimination thereby of its role as a general hospital, its efficiency and ultimate survival is menaced, and the community will be deprived of that free and alternative choice of opinion and treatment which it has hitherto enjoyed This step is at variance with the promise of the Minister and his instructions to the regional board (R H B (49) 132 [1])

This is no isolated threat, but one that confronts many hospitals of similar size throughout the country Such hospitals as St John's have performed useful work to the community because of their completeness. Dismemberment can only be a retrograde step and should be energetically resisted I urge these hospitals to take action before they are destroyed

London, W 1 JOHN HOWKINS

GENERAL ANÆSTHESIA FOR BRONCHOGRAPHY IN CHILDREN

SIR,—The correspondence on this subject has aroused considerable interest here

Nearly three years ago, Mr Philip Allison, of Leeds, demonstrated to one of us that when the swallowing reflex was abolished by anæsthesia, if iodised oil was placed in the pharynx it was sucked into the bronchial tree Ever since then the method of bronchography used in this unit for children too young for the operation to be carried out under local anæsthesia, has been as follows

The child is premedicated with atropine only General anæsthesia is induced with open ether on a mask, possibly after preliminary induction with a very small dose of thiopentone, or ethyl chloride, or gas and oxygen, according to age Anæsthesia is pushed to the point where cough and swallowing reflexes disappear The mouth is then held open and 20 ml of iodised oil is poured in direct from the bottle Sucking noises can be heard as the oil is drawn into the bronchial tree and we allow the child to take six good breaths before films are exposed No posturing at all is necessary, but better filling is obtained if, towards the end of the induction, carbon dioxide is added—preferably the patient's own Films are taken in an anteroposterior and both oblique directions

Immediately after the exposures, the child is turned upside down—our particular method is to place the child across the shoulder of the person carrying out the bronchogram—hanging from the hips with the head well down Light percussion is carried out over the lung bases and a dish held to collect the iodised oil which trickles back In fact, a very large part of the oil is so recovered, and the patient remains in this position until coughing commences

We have now used this "drowning" method in approximately 250 cases without mishap, and in every case very good bronchograms have been obtained The secret of success and safety is a very quick induction

1 See *Lancet* 1949 ii 703

Notes and News

LEASEHOLD REFORM AND THE DOCTOR

If the recommendations of the Leasehold Committee, which has recently made its final report, are carried out, tenants of premises used for professional purposes will enjoy a number of advantages which have hitherto been denied them Such tenants were excluded from the benefits of the Landlord and Tenant Act, 1927, which applied only to tenants of trade and business premises

Among these new rights which it is proposed should now be conferred on tenants of professional premises, will be the right to recover compensation for improvements executed by the tenant at his own expense Furthermore, security of tenure will be enjoyed, and the tenant, at the termination of his lease, will be entitled subject to certain qualifications, to the grant of a tenancy for a further period not exceeding 14 years The right to further renewals from time to time will also be enjoyed

The tenant, however, will have to prove that the net profits derived from his practice will substantially diminish if his tenancy is not renewed, and this is more likely to happen in the case of a general practitioner than of a consultant

If a new lease is ordered to be granted, the rent payable will be fixed, if necessary, by the tribunal itself; and it will be the ordinary rental which the premises would command in the market, not enhanced in any way by any additional value that may have accrued by reason of the fact that the particular tenant has practised there in the past Further more any additional value due to any improvements that the tenant may have made will be discounted in determining the market rental

In the event of the tenant being unable to obtain a renewal of his tenancy, he will be entitled to compensation It is not quite clear how this compensation will be assessed in the case of medical practitioners Prima facie, it will represent the additional rental value enjoyed by the premises because the tenant has been practising there

Certain conditions will have to be observed by the tenant who proposes to claim a renewal of his tenancy, among them being the service of a notice of claim on his landlord within the period to be prescribed Landlords, however, will be placed under the statutory obligation of warning their tenants in good time of their rights, and of the necessity of making a proper claim

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University of Oxford

In a congregation on June 22, the degree of D M was conferred on J E French, R G Macbeth, and Margaret A Jennings

University of Cambridge

Dr D Russell Davis has been appointed reader in clinical psychology The following further appointments have been made Mr J W Millen, M A, Dr H. Butler, and Mr M. Harty, M.A. to be university lecturers in anatomy, Mr E C Webb PH.D to be a university lecturer in biochemistry, and Dr W M. Keynes Dr J D Lever Dr D Bulmer and Dr W J St E G Rhys to be university demonstrators in anatomy

University of London

The following have passed the examination for the diploma in bacteriology from the London School of Hygiene and Tropical Medicine

J D Abbott B E Andrews S M H Bokhari Naomi Datta A D Evans C R Knappett G L Le Bouvier Elinor W McCloy J P P Mackey G B B White

Mr Richard M Titmuss of the Medical Research Council s social medicine research unit has been appointed to the university chair of social administration, tenable at the London School of Economics and Political Science, from Oct 1 1950

Mr Henry McIlwain, D SC, has been appointed to the university readership in biochemistry tenable at the Institute of Psychiatry from Oct 1, 1950

University of Edinburgh

On July 6 the honorary degree of LL.D was conferred on Dr R W Johnstone, professor emeritus of midwifery and diseases of women.

University of Durham

On June 30 and July 1, the following degrees were conferred

M.D—C B Henderson Cyril Josephs *G S Michelson William Walker J E Wilson *W K Yeates

M.B B.S—John Anderson, Jean Armstrong, J S Beardcroft Dorothy G Blackett Ord Mary A Brennan I S Brown Henry Byrne Reginald Carr Joan M. Cashman *Arthur Chesshire D B Clough Irene Colbert Greta I Drummond Ola E P During Meyrick Graham *R. P Graham Mary E S Gray, Kenneth Hardy R J Harris Anne Harrison W R Heeler *J G Hindmarsh K W Holt Geoffrey Hurst Peter Hutchinson Audrey Jennings B O Kawala Joyce L Kemp Arthur King, June M. Kirk, J C Knox *G B Lawrence, Hilda M McCormick, J A McCraith *M. J Morgan Elizabeth Nicholson J D Rickinson Clifton Robertson Derek Russell *Colin Shadforth Monnica Stewart, K A Stone Noel Thompson T A Trotter D M Turnbull K E Wardill Joyce M. Watson F J Wilkinson, Bernard Zimet

D.P.H—Albert Forster

* In absentia

University of Manchester

The following have been successful in recent examinations

M D—H J Beard D L Chadwick (with commendation) Hyme Lempert Helen E Smith A B White

Final M.B, Ch.B (old regulations)—R M. Ashton H G Fleetwood Jean M Halliwell G M. Ingall Geoffrey Jessup B P Jones Margot Nelken, Arthur Noar

Final M.B Ch.B (new regulations)—*Maria R Mackay (awarded honours) B L Alexander, R D Atherton W de C Baker *Flora M Bisset Smith S M Broman Peter Burgess Muriel D Carr Barbara M Couldwell E J Epstein J D Evans M C Flasher Milos Fox Geoffrey Garrett F G Hardman Bernard Higgins, S G Jeffs William Kerns P B Lees B J Leonard M A Lerner W H Lyle Nancy Parkin, Robert Price G V Purnell K. L Purnell James Robinson Dora M. J Rosbotham Roy Schofield Sydney Shubert Beatrice M. Swift Hazel W Symon G M. Watson Sheila M. E West A M Womack

*Distinction in surgery

University of Glasgow

The following degrees have lately been conferred

M D—L R C Agnew (high commendation) R D C Bracken ridge J C P Logan (commendation) D L Mackenzie J H Ramage (high commendation) J M. Sutherland (high commendation) Thomas Symington (honours)

Ch M—R A R Taylor

M.B, Ch.B—James Adam (Troon) James Adam (Blairgowrie) Elizabeth J F Anderson John Anderson Thomson Anderson F A Arcari Margaret S Baillie W H Bain Mary M. S Bannatyne John Barker J R Barr T B Begg J I Bennet, W P Black N J Blackiock I A Boyd Jessie M. M Boyd R. J I Boyd J P Boyle M T D Braide Edwin Brookes W C Brown, J C Bryce Isabella R Buchanan, Hugh Budge Thomas Burnet J L Cameron D A F Campbell J B Campbell Margaret R Campbell F J Cherington J A Clark Elizabeth J Coulter Winifred Coutts Ann C Coyle A P Crawley Margaret W Devlin Evelyn J W Dobson W P Duguid Alexander Edgar R F Edington B D Fairgrieve, William Ferguson A G Findlay F B Findlay I W Fingland W L Flanagan J C Fraser Diana M. Game I A M Gibb W M. Gilmour Ellen W Givens Charles Gold D P Gourlay A C Gow P A Graham, A D Hally Katherine M Harvey Margaret T Harvey J W D Henderson R V Henderson Eileen E Hill, Ruby D M Holms C C Hosie Dorothy W Hunter D C Hutchison A E Ikomi Hazel E Jackson John Jamieson Constance M Jarvie B A Johnson H B Kennedy Joyce C Ker Elaine H M Kerr Mary C W Kerr William Lang Mary R. Lindsay N H Logan E O Lundholm Helen S McArdle, Katherine M. McArthur Mary H McArthur, J A C MacAuley, Helen M M McCallum I S Macdonald Jessie Macdonald Margaret M Macdonald A I Macdougall Norma M C A McFarlane, Thomas Macfarlane, D D Macfie Margaret R M. McGilvary D D R McInroy, John Macintyre, K S Mackenzie J A McKinnon W F Maclay Margaret E Maclean L S McLeish Elizabeth J McLelland Aileen C McMillan James McNeill Mary R Mactaggart John MacVicar Agnes J H McWilliam Agnes J H Malcolm J G Mann J P Masterton, I D Melville R S Miller, J G Mone J D Murchison Margaret R H Murray J W Nudelman James Patterson R T Pettigrew Robert Pringle E G Ramsay A. M Rankin J P Reid T M. Rein, Hugh Richmond A R Robertson I P C Robertson, L D S Rogen A A Schwarz J S Scott D A Seaton David Sherret, Janet A Sinclair (née Kilpatrick) A C Smith G L Smith R G Sommerville, D M. Sproull J H Stewart, W N Stirling H M Strathern N W Struthers Audrey J C Symons A M. Thomson John Thomson J R Thomson John Torley Julia Torrance J D Tripney Dorothy M. B Ward W C Watson A W C. Weir Jessie M R Weir A W O Williams R E D Williams, George Wilson Helen C Wright W B Wright W O Wynn L W M. Yelland A B Young Norman Young

University of Dublin

On July 5 the following degrees and licences were conferred.

M.D—L A Kerwood D E Mellon

M Ch—D S Quill

M.A O—M. T S Conradie Henry FitzGibbon M L McCauley

M B B Ch B.A O—J N Adair, R A L Agnew T M Bamford Reva Berstock, Germaine H Boland (formerly Ross) K. F N Bourke Doris B Brownell, S H Buchalter A M Cantor Gerald Caplin Anne L J Cusack P A H Davis K. K. O Bentsi Enchill Renee A Fleury Jane C Gatliff M J H Hamilton Mabel M. H Hodgins D A A Lane, Sylvia Lath Phyllis M. Lee C D Levis J W Lewis W C McCord F J McHugh J C McLean Helen P Manning E A Martin Robert Nelson, Hilary G Orr Henry Parsons Pauline M. Poole Elinor D U Powell J A N Poynton V P O Sullivan Quinn, Anna I Roberts W B Seale A A Sweeney Annie M G Troughton Mildred Vilensky Margaret Wallace

L Med L Ch L.A O—David Miller

hospital or institution In decreeing this new burden the Bill makes no distinction between future students and present students Hundreds, perhaps thousands, of the latter signed on and have since done years of this training, on the old conditions How can the new burden be justly thrust upon any of these against his will ?

2 There is no upper limit to this extra period of compulsory resident service Subject to the approval of the Privy Council the General Medical Council is empowered to extend it indefinitely (Sec 2 [1])

3 A student is to be entitled to registration only if the diploma granting "body are satisfied that his service has been satisfactory" (Sec 2 [2]), but though dissatisfaction may thus prejudice or even end his medical career, the Bill gives him neither a right of appeal nor even a right to a statement of the grounds of the alleged dissatisfaction

4 But for this Bill the qualified student would himself be the junior house officer (who is of course at present a full blown doctor), while under it he will be doing, in effect, the junior house officer's work without either the doctor's status or any right even to the house officer's remuneration I quote Mr Aneurin Bevan (*Hansard*, 27th June, 1950, col 2135)

' For the most part it is anticipated that he will hold what are in effect junior house appointments, that is, posts as house surgeon or house physician At present these are held by doctors after registration "

Trifles such as remuneration, status (even within the hospital and under supervision, like the present junior house officer, by the senior staff), rights, privileges, and powers are airily ignored, and, so far as any express provisions go, the Bill contents itself with (Sec 4 [3]) decreeing degradation I also wonder what those words "for the most part" mean ?

5 The Bill requires the "intern" (hitherto junior house officer) to serve in two successive appointments, one medical, the other surgical, but contains no provision against the possibility that he may be quite unable at the proper time to obtain one, or both, of them There is in it nothing postdating its operation till it is certain that there not only are, but will continue to be, enough "approved" appointments to absorb, without delay, the whole of each successive "entry" And the unfortunate who notwithstanding due diligence may hereafter fail, either because there is no vacancy for him at the right moment or for any other reason (such as dissatisfaction, well or ill founded), to secure without delay, or at all, either or both of the indispensable jobs will have plenty of leisure for repenting his unwisdom in having trusted at this stage to hopes and assurances, rather than to the curt finality of an amendment

6 The Bill contains no provision for the families of the married men, now—for the first time in the history of medical training—to be compulsorily separated from them for this additional period, which under the Bill is exceedingly unlikely to be less than twelve months, but may well (once the thin end of the wedge has been successfully introduced) be greatly more

Guildford, Surrey W B MANLEY

SIR,—The Medical Bill, 1950, is now, after quite extraordinarily rapid progress through the House of Lords and through its second reading in the House of Commons, very shortly to reach the statute book

The British Medical Students' Association has given very careful thought to those parts of the Bill which deal with alterations in medical training Many important provisions of the Bill are not accurately defined and a very great deal will depend upon the way in which they are finally interpreted by the General Medical Council For this reason I should like to draw attention to one significant point which is giving rise to considerable anxiety among medical students—namely, that the newly qualified and "provisionally registered" doctor will be allowed to practise only in an approved hospital and under supervision At the moment there are a large number of well qualified and keen young doctors whose financial circumstances will not permit them to serve for two six monthly house appointments even though they might supplement their earnings by locum tenens positions between such appointments If and when the Bill is enacted, a provisionally registered doctor will no longer be allowed to act as locum tenens, and unless some central fund is provided there are likely to be many young doctors who will suffer financial hardship in the period between qualifying and obtaining their first appointment and also in the interim period between the two compulsory hospital appointments

British Medical Students Association,
B M A House Tavistock Square
London, W C 1 P L C DIGGORY

DUAL CAUSE OF RAPID DEATH

SIR,—The following post mortem findings must be unusual

A boarding house keeper, aged 53, was last seen alive by her husband when he left for work at 7 45 A M On his return at midday, he found her lying between two beds, which she had obviously been making Apart from a local mastectomy fifteen years previously, she had not had a day's illness or complaint Her death was reported to the coroner At necropsy there was a large recent left-sided cerebral hæmorrhage There was also a hæmopericardium, due to spontaneous rupture of the aorta just above the aortic valve This rupture probably occurred shortly after the onset of the cerebral hæmorrhage

Either event would, of course, have caused death

Kent and Canterbury Hospital
Canterbury I B MORRIS
Pathologist

INJURY FROM ELECTRIC WASHING MACHINES

SIR,—I read with great interest Mr Wade's letter last week He says that domestic washing machines fitted with electrically driven wringer rollers are rare in the British Isles In fact, however, of the six best known makes of electric machine, four have power driven rollers, one has a crank operated wringer, and one uses a centrifuge method of moisture removal As regards Mr Wade's comment on the need for a safety device on power roller machines, all four of the machines mentioned above have a clutch lever on the frame to disengage the drive and a horizontal bar near the rollers to separate them by spring action at the slightest pressure

Lidget Green Bradford T J WYNN

EXPENSIVE PRESCRIPTIONS

SIR,—In your leading article last week you wrote "But anyone who is anxious to see the limited funds of the N H S used on essentials must be distressed by merely casual expenditure on remedies which are obtainable more cheaply under another name" You also wrote "'new drugs of proved value not yet standard' should be freely prescribable without reservation"

There is one source of waste which could be removed by the stroke of a pen I refer to purchase tax of 33⅓% payable on new drugs until they have been specifically exempted I have in mind thiosemicarbazone, on which you reported on Feb 11 (p 264) and the efficacy of which, in suitable cases, was endorsed at the recent meeting of the British Tuberculosis Association at Oxford There can be little doubt that such a drug should be prescribed, if only for a limited trial at present, but that the Exchequer should mulct the National Health Service of an extra 6s 8d for every pound spent on clinical trial seems to me quite absurd

Douglas House Bournemouth A E K SALVI
Medical Superintendent

NURSING AND TUBERCULOSIS IN A GENERAL HOSPITAL

K P BALL
M.D Lond. M.R C.P
CHIEF ASSISTANT IN THE MEDICAL DEPARTMENT CENTRAL MIDDLESEX HOSPITAL

H JOULES
M.D Lond, F.R C.P
MEDICAL DIRECTOR AND PHYSICIAN TO THE HOSPITAL

C H C TOUSSAINT
M.R C S, D.P.H.
CHEST PHYSICIAN TO THE HOSPITAL AND TO WILLESDEN CHEST CLINIC

J A. HEADY
M.A.
OF THE SOCIAL MEDICINE RESEARCH UNIT, MEDICAL RESEARCH COUNCIL

THE difficulty of finding enough nurses and hospital beds for patients suffering from pulmonary tuberculosis is one of the most serious medical problems of today. Early diagnosis means little if it is followed by nine months' wait for treatment, and, as the Minister of Health stated recently, there are at present 11,000 patients in England and Wales awaiting admission to sanatoria. Much of the problem would be solved if general hospitals would allocate beds for this purpose. Yet some fear that such a policy would result in a greater tuberculosis morbidity in the nurses of these hospitals. Since we have found that patients with pulmonary tuberculosis can be nursed in the separate tuberculosis wards of a general hospital with little risk to nurses, provided certain precautions are adopted, we are recording our findings. The Mantoux conversion rate and the tuberculosis morbidity have been studied for the student nurses entering the hospital between 1945 and 1949, and the results are compared with those obtained by the Prophit Tuberculosis Survey (1948).

THE HOSPITAL

Central Middlesex is a large regional hospital admitting every type of case. During the war the tuberculosis wards had been evacuated and as a result complete segregation of the tuberculous patients was not possible. Many nurses, including a few who were tuberculin-negative, had been to a nearby sanatorium for tuberculosis training. By September, 1945, two wards with 58 tuberculosis beds had been reopened and the policy of prevention of infection of nurses described below has been enforced since that time.

THE NURSES

Between July 1945, and May, 1949, 312 student nurses entered the hospital. Of these, 252 entered through the preliminary training school (P.T.S.) and therefore could not reach the wards until October, 1945—i.e., after the reopening of the tuberculosis wards and the institution of the policy of control of infection. The remaining 60 nurses, already partially trained, entered the wards direct between October, 1945, and May, 1949. Since 57 nurses left from the P.T.S., only 255 out of the 312 nurses actually entered the wards, and it is on these 255 that the initial tuberculin testing figures are based—although, as explained below, only 190 of them were tested. Moreover, since 22 nurses were still in the P.T.S. at the end of May, 1949, only 233 nurses had worked in the wards up to this date. Details of the nursing population are as follows:

Entered between July 1945 and May 1949		312
Entered through P.T.S.	252	
Entered general wards direct	60	
Nurses leaving from the P.T.S.		57
Nurses reaching wards		255
Entered wards before May 1949		
Still in P.T.S. May 1949	233	
Tuberculin tested	22	
Not tested	190	
	65	

6621

Of the 65 not tested 31 left within three months of entering the wards and 8 within six months; the remaining 26 came from sanatoria where they had been tested already. Of the 190 nurses receiving their initial tuberculin test, 71% were aged twenty-one or under at the time. Their age distribution when tested was as follows:

No. of nurses	Age (yr.)	No. of nurses	Age (yr.)
38	17	9	24
40	18	8	25
25	19	5	26
20	20	1	27
12	21	6	28
10	22	2	29
4	23	10	30 and over

Details of the country of origin of all the nurses were not kept, but a survey in 1944 had shown that 70% were English and 14% were Welsh or Irish, and there is no reason to believe that the present group was very different.

CONTROL OF INFECTION

Various precautions are adopted in this hospital to diminish the risk of tuberculous infection and to assist early diagnosis should disease develop.

Tuberculin Testing.—During the period surveyed the nurses were tested soon after they entered the general wards (although they are now tested in the training school). Non-reactors are re-tested at three-monthly intervals until conversion. After conversion the nurse is interviewed and told to report if at any time she is not feeling well. A sedimentation rate is done and an X-ray film taken every 3 months for a year. She is not allowed to work on a tuberculosis ward for one year after conversion.

Chest X-rays.—All nurses have a chest film taken before entry and then at yearly intervals.

The Undiagnosed Case of tuberculosis on the general ward is one of the chief sources of infection. Ideally a chest film should be taken on every patient admitted to hospital but this is not possible at present. However, X-ray films are taken of nearly all chest cases admitted, thus keeping the number of unsuspected cases of pulmonary tuberculosis down to a minimum.

Immediate Transfer.—When a diagnosis of open tuberculosis is made on a patient in a general ward, he is immediately transferred to one of the tuberculosis wards. Since one emergency bed on each of these wards is kept vacant for the purpose, transfer within forty-eight hours is nearly always possible.

The Tuberculosis Wards.—Tuberculin negative nurses are not allowed to work on these wards. The floors are oiled, the nurses wear gowns while at work and in addition wear face masks while bed making. No nurse handles the sputum mugs, in view of the known susceptibility of young nurses to infection, this work is done by an elderly male porter. With all patients, particular stress is laid on the need to stop coughing.

TUBERCULIN TEST

The tuberculin used is the protein purified derivative (P.P.D.). The first dose, 0·1 ml. of P.P.D. (equivalent to 0·0002 mg. P.P.D. per ml. or 1/10,000 Old Tuberculin), is injected intradermally. If there is no reaction after forty-eight hours, a repeat with P.P.D., last dose (≡O.T. 1/100) is given. Those who react doubtfully after the first injection are given P.P.D., intermediate dose (≡O.T. 1/1000). The standard adopted is that used by the Prophit survey—i.e., a positive reaction is one with 5 mm. or more of infiltration.

University of Sheffield

Mr C Scott Russell has been appointed to the new full time chair of obstetrics and gynæcology

Mr Russell qualified M B at Edinburgh in 1935 and after holding various hospital appointments was successively research assistant and first assistant in the Nuffield department of obstetrics and gynæcology at Oxford In 1946 he went to Manchester as assistant director in the university department of obstetrics and gynæcology and resident obstetrician and gynæcologist at St Mary s Hospitals and last year he was appointed to his present post of reader He became F R C S E in 1939 and M R C O G in 1940 Mr Russell is the author of two books—*Child-bearing Years* and *Obstetrics and Gynæcology*—both published in 1947

Dr William Whitaker has been appointed lecturer in medicine and Dr R F Crampton assistant lecturer in physiology The following part time appointments have been made Dr C S Darke, lecturer and clinical teacher in chest diseases, and Dr D J Campbell, lecturer and clinical teacher in venereal diseases

Royal College of Surgeons of England

Election to the Council—Mr Hedley Whyte, Mr E W Riches, and Sir Arthur Porritt have been elected members of the council The result of the poll was as follows

	Votes
A HEDLEY WHYTE (Royal Victoria Infirmary Newcastle upon Tyne)	904
E W RICHES (Middlesex Hospital)	831
Sir ARTHUR PORRITT (St Mary s Hospital)	691
IAN AIRD (Postgraduate Medical School of London)	679
R L NEWELL (Royal Infirmary Manchester)	661
V W DIX (London Hospital)	398
N L EOKHOFF (Guy s Hospital)	296

Royal College of Surgeons of Edinburgh

Honorary fellowship of the college has been conferred by Mr W Quarry Wood, the president, on Dr D C Balfour, director of the Mayo Foundation and past president of the American College of Surgeons, and on Dr A W Allen, a former president and now chairman of the board of regents of the American College of Surgeons

Royal College of Surgeons in Ireland

The following have been admitted to fellowship of the college

J D Cunningham James Conroy D J F Devane, T J Mills, J P O Neill A T S Paul D L Robinson

Kent Pædiatric Society

At a meeting of this society to be held at the Star Hotel, Maidstone, on Saturday, July 22, at 2 30 P M, Dr L T Hilliard will speak on Mental Deficiency as a Social Problem

Royal Institute of Public Health and Hygiene

Sir Leonard Parsons, F R S, has been appointed the Harben lecturer for 1950 His lectures, to be delivered on Dec 11, 12, and 13, will be concerned with Studies on Child Health

Home Office Appointment

Dr H T P Young has been appointed inspector of retreats under the Inebriates Acts, 1879–98

Homœopathic Congress

A joint congress of the Council of the International Homœopathic League, the Faculty of Homœopathy, and the British Homœopathic Congress is to be held at the Royal London Homœopathic Hospital on July 26–28

Lists of Principals with Assistants

The General Medical and Pharmaceutical Services Regulations and the model allocation scheme allow a general practitioner who employs a permanent assistant (apart from a trainee assistant) to increase his list of patients by 2400 beyond the ordinary maximum In a letter to executive councils, the Ministry of Health states that "in general it would be reasonable to regard as a permanent assistant not only a full time assistant but also an assistant regularly employed part time for at least one half of the time that a full time assistant would normally serve the practice, that in the case of such a part time assistant it would be reasonable for an Executive Council to agree that the principal's list might be increased by a proportion of 2400 approximately equal to the proportion of the time given by the assistant, but that where the assistant is employed for less than half time no increase in his principal s list should be permitted" These criteria should it is suggested, be applied only to future cases in which the employment of an assistant is approved, there should be no change in arrangements already agreed to

W H O Regional Office for Western Pacific

Dr T C Fang is temporarily to direct W H O activities in the Western Pacific, for which a regional organisation is to be set up next year The temporary office is to be in Hong Kong

A C T H in the U S A

Adrenocorticotropic hormone (A C T H) has now been made available to all 6572 hospitals in the U S A that are registered by the American Medical Association, according to a B U P report

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CORRIGENDUM *Convalescence for Diabetics*—In our note on two convalescent homes for diabetics (July 1, p 18) we described the home at Burley on the Hill, in Rutlandshire, as sponsored by the British Red Cross Society This home, though originally founded by the Red Cross, now comes under the Leicester No 2 Hospital Management Committee of the Sheffield Regional Hospital Board, and has been renamed the Burley on the Hill Auxiliary Hospital

Diary of the Week

JULY 16 TO 22

Tuesday, 18th

UNIVERSITY OF EDINBURGH
5 P M (Anatomy Lecture theatre University New Buildings) Dr George W Corner (Baltimore) Benjamin Rush, M D—his Edinburgh Student Days and What Came of Them (Macarthur lecture)

MIDDLESEX COUNTY MEDICAL SOCIETY
5 P M (Edgware General Hospital) Sir Alexander Fleming F R S Success (John Tate lecture)

SOCIETY FOR THE STUDY OF ADDICTION
4 P M (11 Chandos Street London W 1) Mr L D Macleod, B Sc Biochemistry and Alcoholism

Friday, 21st

BIOCHEMICAL SOCIETY
11 A M (Department of Biochemistry, University New Buildings Edinburgh) Short papers

Appointments

HERON WATSON FRANCES M B St And D P H senior asst M O, maternity and child welfare and supervisor of midwives West Sussex

HOWAT D D C M B Lond D A consultant anæsthetist thoracic surgery unit, Nottingham group of hospitals

LEITCH J A M B Edin D C H D P H asst M O H Nottingham,

SHENNAN, E T M B Aberd, D P H asst M O H, Worcestershire, and M O H Redditch and Bromsgrove

SUTHERLAND MARY M R C S orthopædic registrar York County and City Hospital

WARWICK ELSPETH M B Edin D P H senior asst. M O H., Nottingham

Births, Marriages, and Deaths

BIRTHS

BALDRY—On July 10 at Hillingdon the wife of Dr P E Baldry—a son

BARCLAY—On July 1, the wife of Dr Paul Barclay—a daughter

BURFIELD—On July 3 at Shifnal the wife of Dr George Burfield—a daughter

CRICK—On July 1, at Auckland the wife of Dr Anthony Crick—a son

DALE BUSSELL—On June 29 at Newmarket the wife of Dr A P Dale Bussell—a son

EVERALL—On June 30 at Leeds the wife of Dr John Everall—a son

HARDWICK—On June 26 the wife of Dr S W Hardwick—a daughter

MATTHEWS—On June 28 in London the wife of Dr P H A Matthews—a daughter

OGILVIE—On June 7 at Ealing the wife of Dr A C F Ogilvie—a daughter

REEVES—On July 3 the wife of Dr R G W Reeves—a son

RIDDELL—On June 28 in Edinburgh the wife of Dr Michael Riddell—a son

STANBURY—On July 3, the wife of Dr S W Stanbury—a son

MARRIAGES

LEVIN—LAZARUS—On July 5 in London Arthur Levin M R C S to Alice Lazarus

DEATHS

CAMERON—On July 2 in Exeter Colin John Norman Cameron, M R C S

RAY—On July 5 in London Matthew Burrow Ray D S O, O B E, M D Edin M R C P

RISHWORTH—On July 6 in London James Maud Rishworth M B N U I D P H aged 64

YOUNG—On June 28 in Chichester John Charles Young M R C S aged 78

primary infection X ray films of the remaining re all normal

se 1 —Aged 18, English She was tuberculin negative May, 1947, to January, 1948 In May, 1948, she oped erythema nodosum and was found to be tuberculin ve Her erythrocyte sedimentation rate (E S.R.) was 38 n X ray film showed a primary focus in the right mid zone enlarged hilar glands She went to a convalescent and was away from work for six months

se 2 —Aged 19 Entered in March, 1947 She was rculin negative from July, 1947, to January, 1948 In 1948, she developed a mild attack of erythema nodosum X ray film of the chest was normal In May, 1948, she tuberculin positive She was away from work for a , though cases of erythema nodosum usually have a er convalescence

mong the 12 nurses undergoing conversion before tuberculosis wards were opened, 4 (33%) were ill account of primary infection and were off sick for a al of twenty nine months, 2 had erythema nodosum h enlarged hilar glands, one had malaise and night ats with a raised E S.R, and one had a fever for three eks associated with a primary focus in the right lung

MORBIDITY

The criteria for morbidity adopted are those of the ophit survey, which are

Clinically active pulmonary tuberculosis
Latent subclinical pulmonary tuberculosis, progressive
Latent subclinical pulmonary tuberculosis non progressive
Non pulmonary tuberculosis
Pleural effusion.

ses of erythema nodosum unaccompanied by any other berculous manifestation are not included (Case 2 was only one)

The morbidity figures are based on cases admitted to staff sick bay Nurses with symptoms of tuberculous ease, those with progressive radiological lesions, and se with lesions of doubtful activity are admitted for essment Since X ray films taken before 1945 are no ger available, cases of latent subclinical pulmonary berculosis, non progressive, have been excluded from morbidity figures, but allowance is made for this in mparing them with the results of the Prophit survey In all, 312 nurses spent a total of 346 years in the spital up to May, 1949, including time spent in the r s For the reasons already given above 233 nurses tually worked on the wards during the period, for a tal of 290 years Three nurses whose X-ray films were rmal on admission developed tuberculosis, one of ese has been described (case 1) The other two (cases and 4) developed pleural effusion while in the training-hool. Since pleural effusion usually occurs six to twelve onths after Mantoux-conversion (Thompson 1949b) it probable that infection occurred before entry

Case 3 —Aged 26 Her sister had pulmonary tuberculosis ntered P T.S on Oct 28, 1946 A few days later she veloped left pleural pain and on Nov 19 reported sick th a left pleural effusion Guineapig test on pleural fluid as positive She returned to duty on Aug 27, 1947, after ven months' illness

Case 4 —Aged 18 Entered P T S on Sept 1, 1947 On ov 4, she was admitted to the wards with a right pleural fusion Culture of fluid for tubercle bacilli was negative e made a satisfactory recovery but did not return to rsing

Two other nurses were not free from disease on entry

Case 5 —Aged 27 English She had had tuberculous rvical glands as a child, and Bazin s disease for some ars On entry in January, 1946 radiography showed lcified foci in the left upper zone and in the neck. She as tuberculin positive In January, 1948 she developed larged right axillary lymph glands These were excised September of that year and showed tuberculous adenitis e was away from work for [illegible] en weeks

TABLE II—COMPARISON OF MORBIDITY AT CENTRAL MIDDLESEX HOSPITAL WITH THAT OF THE PROPHIT SURVEY

Group of nurses	Observation years	Cases of tuberculosis	Annual rate/1000
Prophit			
Group A nurses	2819 5	52	18 4
Group B nurses	5771 25	50	8 7
Groups A and B together	8590 75	102	11 9
All C.M H nurses (312)	346 0	3	8 7
C.M H nurses in wards (233)	290 25	1	3 4

Note —The Prophit survey rates have been calculated after deducting cases of latent subclinical pulmonary tuberculosis non progressive for the reason given in the text

Case 6 —Aged 22, Irish Entered in April, 1948, when her X ray film showed a small left apical lesion, later shown to be non progressive She was tuberculin positive In November, 1948, she developed right pleural pain Radiography showed consolidation and later collapse of the right middle lobe E S.R 44 Bronchoscopy showed no bronchial obstruction and the condition slowly resolved Though it may have been tuberculous, sputum and bronchial and laryngeal swabs were all negative for tubercle bacilli. She returned to duty after six months and is now well

Thus out of a total of 312 nurses, 3 developed tuberculous disease as defined by the Prophit survey, for which they were off sick for nineteen months altogether (cases 1, 3, and 4) Two returned to full duty and the third, although she left, was considered medically fit to return In 2 of these 3 cases it is probable that infection occurred before they started training (cases 3 and 4) The other nurse (case 1) had symptoms as a result of her primary infection

Apart from the above, one nurse had a relapse of tuberculous adenitis (case 5), one developed a collapsed middle lobe of doubtful etiology (case 6), and one had a mild attack of erythema nodosum (case 2) The last 3 were off sick for a total of eight months

Morbidity rates cannot be considered significant when the numbers are so small However table II shows those of the Central Middlesex nurses and the Prophit survey

Although the use of B C G is probably most valuable for increasing the nurse's resistance to infection, there is a danger it may be adopted without the precautions that have been described We have shown that these precautions by themselves can considerably reduce tuberculous infection

USE OF BEDS FOR TREATMENT

Apart from its function in the prevention of infection, the tuberculosis unit in the Central Middlesex Hospital has been invaluable in other directions Most deaths from phthisis occur in the 15–50 year age groups, in which the disease is often acute, with rapid spread. Such cases must be regarded as medical emergencies Diagnosis should be established at the earliest moment and must be followed by *immediate* treatment It is a grave reflection on national administration that, throughout Britain, thousands of phthisical patients are

Fig 2—Case 7 on Dec. 17 1949

Of the 255 nurses who entered the general wards 190 were tested The result of the initial test was

	Tuberculin positive		Tuberculin negative	
	No	%	No	%
Nurses tested (190)	141	74	49	26
Previously trained (25)	24	96	1	4
With no previous training (165)	117	71	48	29

COMPARISON WITH PROPHIT SURVEY

The Prophit survey compared the Mantoux conversion rate and the tuberculosis morbidity of nurses from two groups of hospitals Group A hospitals admitted all classes of patients including cases of advanced tuberculosis and most of them had tuberculosis wards Group B hospitals did not admit such "heavy" cases, and only one of them had a tuberculosis ward for a part of the survey Central Middlesex Hospital corresponds to a group A hospital in the type of case which is admitted, and in having tuberculosis wards

A considerable part of the Prophit survey was carried out during the war, whereas all the present survey period was post war, and this fact would operate in favour of the present series Poorer ward ventilation during the war probably increased the risk of infection and therefore of Mantoux conversion In addition poorer food and other stresses of war may have decreased the nurses' resistance and helped to increase the morbidity

MANTOUX CONVERSION RATE

The Mantoux conversion rate was calculated for (i) all non reactors (45), who entered the wards between Oct 1, 1945 and May 31, 1949, together with (ii) those non reactors (10) who were already in the wards on Oct 1, 1945

(i) Non reactors on entry (out of 190 tested)	49
Not re tested	4
Re tested	45
(ii) Non reactors already in wards, October 1945	10
Total for calculation of Mantoux conversion rate	55

Non reactors who had not left the hospital were re tested up to May, 1950 Altogether 55 nurses were tested more than once, and of these 19 converted They were, for the most part, re tested every three months, though owing to practical difficulties there were a number of gaps in the sequences The conversion rate was calculated as in the Prophit survey, except that, because of the small numbers and the consequent irregularities (shown in table I) in the conversion-rate from one period to the next, some smoothing of the curve (fig 1) was necessary

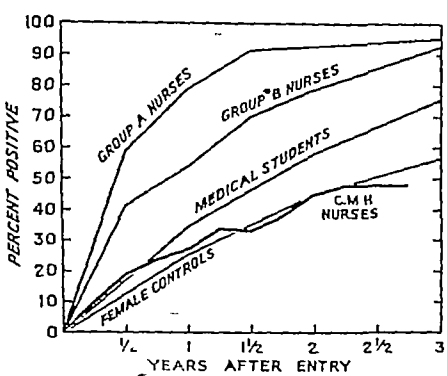

Fig 1—Percentage of persons initially tuberculin-negative who became positive in the first three years Comparison of results at the Central Middlesex Hospital with those in the Prophit survey

Table I shows the conversion rate compared * with that of various groups in the same survey At the end of a year the conversion rate for Prophit group A nurses was 79 6%, for Prophit group B nurses 54 1%, Central Middlesex nurses 27 9% At the end of years the rates were 92 7%, 78 8%, and 44 8%, differences between the Central Middlesex Ho and group B rate at one year and at two years are statistically significant at the 0 1% level. A for Central Middlesex Hospital rates differ from the group A rates The differences bet Central Middlesex Hospital rate and the rates for medical students and female controls are not

As mentioned above, tuberculin testing started January, 1944, some twenty months before the losis wards were opened During this early period non reactors were re tested, of whom 12 con The conversion rate at the end of the first year

TABLE I—COMPARISON OF CONVERSION RATE IN NURS CENTRAL MIDDLESEX HOSPITAL WITH CONVERSION FOUND BY THE PROPHIT SURVEY

Months after 1st test	% of Mantoux negative entrants positive at 3 monthly intervals after first test: Prophit survey * Group A nurses	Prophit survey * Group B nurses	C.M.H survey nurses	Prophit survey Medical students (male)	Prophit survey Female controls	C.M.H nurses * converting in 3 months since last test	C.M.H nurses Number tested
3			10 6			10 6	31
6	58 7	41 5	18 1			8 4	31
9			24 6			8·0	34
12	79 6	54 1	27 9	35 6	26 5	4 4	20
15			34 3			8 9	13
18	91·4	70 0	34 3			0	19
21			38 5			6·4	16
24	92 7	78 8	44 8	59 2	44 9	10 3	18
27			48 9			4	5
30			48 9			0	1
33			48 9			0	3
36	95 1	92 7		75 5	57 1		

these nurses was 57 8% The difference between this rate and that for the first year in the second period (27 9%) is significant at the 5% level but not at the 1% level Clearly not much weight must be attached to this result, where only 21 nurses are concerned. I is mentioned here for completeness and to show that th rate for this period is at least not smaller than that fo the second period

It was possible that the nurses in group (ii) migh include some who were highly resistant to conversio and that the combined rate for groups (i) and (ii), give in table I, might be artificially low for this reason Th this was not so is demonstrated by the fact that rat for group (i) alone were 24 4% in the first year an 43 1% in the second year—both smaller than th corresponding rates for groups (i) and (ii) combined

Since it is agreed that the Mantoux conversion ra of a group of persons is the best index of the degree their exposure to tuberculous infection, these resul strongly suggest that the precautions described ha been effective in reducing the risk of infection amon nurses Other relatively low rates among nurses ha been reported Court (1949) found a conversion rate 36% in the first year in a similar type of hospital Fro New Zealand, North (1941) reported a rate of 34 6% a Thompson (1949a) a rate of 14 9% in the first year hospital nurses It is interesting to note that all t above hospitals used similar precautions to those reco mended by the Prophit survey which are essentia the same as those used at this hospital

MANIFESTATIONS OF MANTOUX CONVERSION

As has already been stated above, of the 55 no reactors re tested after October, 1945, 19 und went Mantoux conversion Of these, 2 (10 5%) w admitted to sick bay on account of symptoms due

* The statistical test used in comparisons in this paper was the usual one for the difference of two percentages with the number of nurses tested in each group as the denominator Where there was any doubt and in the main comparison with Prophit group B nurses the χ^2 test was used as a check.

been divorced from medicine for too long, and thousands of students have qualified and entered practice with le or no knowledge of the early manifestations of hisis Yet in England and Wales this disease is ponsible for 400 deaths a week Tuberculosis wards general hospitals can but lead to a revival of interest his common disease Opportunities for undergraduate l postgraduate instruction can be increased and should d to better standards of diagnosis and treatment oughout the country Tuberculosis must be brought ck into the main stream of medicine

SUMMARY AND CONCLUSIONS

Studies of Mantoux conversions show that the risk of ection to nurses in a general hospital need be little eater than that to a comparable section of the general pulation

At the Central Middlesex Hospital, the Mantoux nversion rate of 27 9% for the first year is significantly wer than rates found for student nurses by the Prophit rvey (which reported 79 6% for group B hospitals, d 54 1% for group A hospitals) This low rate is tributed to precautions used at this hospital There is risk that the introduction of B C G vaccination may ad to the continued neglect of these other preventive easures which we have found to be effective

No sputum positive case should be allowed to stay in general ward for more than twenty four hours after agnosis The presence of infectious cases in general ards could be avoided by mass radiographic examination f all admissions and of outpatients

Much active treatment of the tuberculous can be eneficially given at home, if appropriate facilities are vailable to the chest physician in the local general ospital

Tuberculosis should be treated scientifically and xpeditiously in every major hospital or group of smaller ospitals

All nurses and medical students should study this isease intensively

We are grateful to Dr Marc Daniels and to Dr J N Morris or helpful criticism and advice, and to Dr J Sakula, who arried out the earlier tuberculin testing

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PREGNENOLONE IN THE TREATMENT OF RHEUMATOID ARTHRITIS

J P P STOCK
M D Brist, M.R C P
VISITING PHYSICIAN

E C McCLURE
M.B Belf
LATE HOUSE PHYSICIAN

CITY GENERAL HOSPITAL, STOKE-ON TRENT

THE remarkable action of 'Cortisone' and adrenocorticotropic hormone (A C T H) on rheumatoid arthritis (Hench et al 1948) raises the question whether other, more readily available, compounds exist with comparable therapeutic properties This problem is of more than theoretical interest, for supplies of cortisone and A C T H are unlikely to increase greatly in the near future and it may be many years before supplies can meet the very large potential demand Moreover, even if supplies were abundant side effects might seriously limit the usefulness of these two substances In the search for substances with similar properties, much attention has naturally been given to steroid compounds (Lewin and Wassén 1949, Alexander and Duthie 1950, Kersley et al. 1950)

The clinical investigation described here began with a trial of a series of steroids in cases of active rheumatoid arthritis The compounds tested included the following desoxycholic acid, Δ_4 pregnenol 17β one 3, Δ_4 pregnenol 17α one 3, and Δ_5 pregnenol 3β one 20 (Δ_5 pregnenolone) With the exception of desoxycholic acid, which was given intravenously, each of these compounds was given intramuscularly, usually as the acetate dissolved in a mixture of glyceride ester oils in a daily dosage of 200 mg for at least 3 weeks Owing to restricted supplies, it was possible to treat only two, or at the most three, cases with each of these compounds No objective improvement was noted following the administration of desoxycholic acid (2 cases), Δ_4 pregnenol 17β one 3 (3 cases), or Δ_4 pregnenol 17α one 3 (3 cases)

Δ_5 pregnenolone was the next compound to be investigated In the hands of Freeman et al (1950) this substance has benefited cases of rheumatoid arthritis, and Davison and Koets (1949) have described favourable results from its use in ankylosing spondylitis

CLINICAL MATERIAL AND METHODS

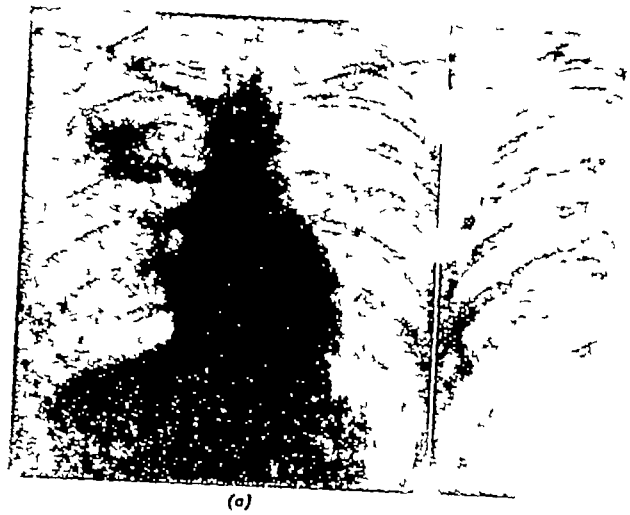
In a preliminary trial, two women with rheumatoid arthritis and one man with ankylosing spondylitis were treated with Δ_5 pregnenolone The case of ankylosing spondylitis and one of the cases of rheumatoid arthritis showed early objective improvement, and it was therefore decided to give this substance a more extended trial As supplies of pregnenolone were limited, it was possible to treat only seven further patients, and this further investigation was confined to cases of rheumatoid arthritis The whole group consists, therefore, of one case of ankylosing spondylitis and nine cases of rheumatoid arthritis

The criteria for the selection of cases were that the patients should be suffering from well established rheumatoid arthritis of at least 1 year's duration, and that the disease should be active as evidenced by pain, soft-tissue swelling, and a blood sedimentation rate (B S R) consistently raised above 25 mm in 1 hour (Westergren) In the accompanying table, the ten cases in the series have been graded according to the stage of the disease, by the standards which Steinbrocker et al (1949) recommended Except for the patient with ankylosing spondylitis, all remained in hospital under close supervision throughout the trial, and the seven cases in the more extended trial were observed in hospital for 1 month before treatment was begun Initial laboratory investigations included full blood count, blood uric acid, blood urea, and blood protein estimations, and X ray examination of all affected joints The B S R was measured once, and often twice, each week throughout the period of observation and trial

A goniometer was used for measuring the range of joint movement in the shoulder, elbow, wrist, and knee As a method of precision, goniometry of joint movements is open to criticism, but we felt that it was extremely important to employ some recordable form of objective measurement In practice, moreover, we were surprised at the constancy of the readings obtained by each of us independently from week to week in the same cases All measurements were recorded to the nearest 5°, and a change of + 10° or −10° was taken to be significant Movement at the shoulder was recorded as the degree of abduction obtainable in the coronal plane, internal and external rotation were gauged in general terms In cases with involvement of the hip joint, the degree of abduction was usually recorded by the maximal intermalleolar distance obtainable at the ankles, measured with a tape measure The power of the hand grip was measured in some cases by a spring dynamometer, with patients who were unable to record on this instrument, the grip was measured by

left for months in unsuitable homes In such conditions disease will certainly spread, both within the patient's thorax and also among the inmates of the house The tuberculosis problem is thus being intensified by the spread of infection and disease to others Sound administration leads not only to the arrest and cure of disease, but also to the prevention of disease within the patient's family

Our emergency beds have often been used, also, for the speedy admission of urgent cases from the district, priority being given to the early acute case which cannot be nursed or treated effectively at home



(a) (b)

Fig 4—Case 9: (a) on Aug 2, 1948 (b) on Feb 21 1950

Case 7 —Boy aged 16 Mass miniature radiography negative in March, 1949 Acute pneumonic disease temperature 102°F sputum positive, in December, 1949 (see fig 2) Visited with general practitioner on Dec 16, 1949 Admitted to hospital on Dec 17, weight then 9 st 6 lb Excellent response to chemotherapy and later to right diaphragmatic elevation Discharged home Feb 23, 1950, to continue bed rest and pneumoperitoneum refills June, 1950, quiescent, up and about, weight 13 st

Case 8 —Girl aged 16 May 7, 1948 acute excavating lesions right mid zone (fig 3a) Home visited, poor conditions May 8 admitted to hospital Excellent response to absolute rest and right diaphragmatic elevation Aug 21, 1948, discharged home to continue bed rest and pneumoperitoneum refills June, 1950, disease arrested (fig 3b), in full work

Case 9 —Girl aged 19 Sputum positive, acute exudative disease with excavation in right upper and mid zones Some disease also in left mid zone (fig 4a) Visited with general practitioner Aug 3, 1948, admitted to hospital Aug 4 Good immediate response to absolute rest and right diaphragmatic elevation Oct 25, 1948, discharged home to continue bed rest and refills June, 1950, disease arrested, in full work (fig 4b) Three sisters of school age have remained healthy

With proper management and the full cooperation of the patient, immediate treatment will often bring early arrest of disease and conversion of infectivity The above are but three of many patients who have benefited from the prompt use of emergency beds in the tuberculosis unit The empty beds are maintained by the discharge of patients as soon as they have reached a stage when adequate care and attention can be given in their own home Strict bed rest is then continued for the appropriate period Total admissions to the unit in 1949 were 250

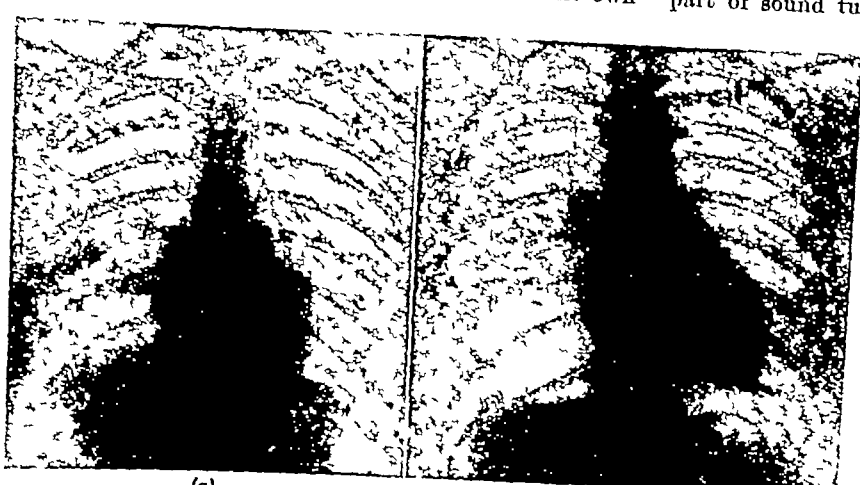
In another group home conditions have been more favourable and have justified the institution of management and of collapse treatment in the home (Toussaint 1950) Between Sept 1, 1946, and June 30 1949, artificial pneumothorax was induced in 70 cases, after a preliminary period of rest, in a further 19 cases pneumothorax followed diaphragmatic elevation Some of these cases were also admitted to the tuberculosis unit for thoracoscopy and adhesion section, most of these were returned in hospital for a few weeks after thoracoscopy, and then returned home to continue bed rest We are indebted to Mr Robert Laird, F R C S E, for his whole hearted cooperation in the work of the unit

In addition, 105 patients were treated in their homes by phrenic crush, to induce diaphragmatic relaxation, and then by pneumoperitoneum These patients were brought to the unit by car for the phrenic crush operation, and returned home the same evening The pneumoperitoneum was started six days later A further group about a quarter to a third of all admissions, came in for appropriate treatment and were later transferred to sanatoria

The prevention and cure of phthisis are clinical problems and should be clearly linked with general medicine Tuberculosis wards in a general hospital are an essential part of sound tuberculosis administration, and lead to efficiency both in preventive and in curative medicine Both patients and staff in the Central Middlesex Hospital have gained immensely by collaboration with other departments of the hospital

The tuberculosis wards are under the direct control of the physician to the Willesden Chest Clinic, additional medical staff of the combined unit are a senior registrar, a registrar, and a full-time house physician The chest physician has direct and personal responsibility for all admissions and discharges A thoracic surgeon visits regularly to undertake bronchoscopies, phrenic crushes, and thoracoscopies

Delay in diagnosis is still a major problem and one that mass radiography cannot solve. Tuberculo



(a) (b)

Fig 3—Case 8 (a) on May 7 1948 (b) on Feb 28 1950

these became increasingly troublesome—particularly left hip joint—causing him much pain and difficulty in ing and also with sitting

regnenolone therapy was started at the beginning of ember, 1949 At this time there was complete fixation ie dorsal and lumbar spine, but the patient was relatively from backache There was severe limitation of move t of both hip joints with gross impairment of internal and rnal rotation and of abduction at the right hip flexion limited to 45°, and at the left hip to 60°, from the trunk ough limitation of flexion at the hip joints, he was unable it up with his legs extended (the maximal intermalleolar ance at the ankles was unfortunately not recorded in this) Chest expansion, measured at the nipples, was in. The B S.R. was 54 mm in 1 hour Radiographs of ie, pelvis, and hips showed the changes characteristic of ylosing spondylitis

'regnenolone 200 mg was given daily by intramuscular ction, with an interruption of nearly a week towards the of November, due to an intercurrent febrile illness ogether 3 g was administered There was gradual sub ive improvement during the period when the injections e given, and 1 week after the completion of injections, patient said he felt better than he had felt for 2 years jectively there was definite improvement in the degree of ion of the hip joints, both could now be flexed to an angle 30° to the trunk, although internal rotation and abduction re still very limited. Chest expansion now amounted to in. The B.S.R at this period was 45 mm in 1 hour ere was no evidence of any movement in the dorsal or nbar spine

On re examination 4 months later, the patient said that the provement not only had been maintained, but had further reased He could now sit up with his legs extended, and e increased flexion of both hip joints had been maintained S B S R was 48 mm in 1 hour

Case 2—A girl, aged 18 years, had a history of relatively ute onset of rheumatoid arthritis in November, 1948 e was admitted to hospital on March 11, 1949, with pain d stiffness involving fingers, wrists, shoulders, and knees, d a moderate intermittent pyrexia of 99–100°F There is no cardiac involvement and no lymphadenopathy, and e spleen could not be felt There was no response to icylates Her B.S.R. averaged 80 mm in one hour Early May, she was started on a course of 'Myocrysin,' which was opped at the end of June when a total of 0 5 g had been ven She was then no longer pyrexial but otherwise her nical condition was substantially unchanged.

On July 22 she was started on Δ_4 pregnenol 17 β-one 3 0 mg daily by intramuscular injection This was con nued for 1 month. No improvement took place, however, id the injections were discontinued On Sept 1 she was arted on Δ_4-pregnenol 17α-one 3 in doses of 100 mg aily, later increased to 200 mg daily This compound was ontinued until Oct 13, when a total of 10 3 g had been given here had again been no significant change in her condition Δ_5 pregnenolone injections were started on Nov 18 t this time the fingers, wrists, and knees were involved nd the patient complained of pain on movement of the houlders, though the range was not restricted Wrist and nger movements were limited, and the skin of her hands was ny to the touch. Functional capacity in the upper was reasonably good, and she could feed herself and her hair Both knees showed appreciable synovial ening but no effusion extension in the left knee was ed to 150° She could just manage to walk a few steps support X ray examination showed typical rheumatoid ges in hands and knees, with absorption of the articular ages of the knees, especially on the left side

pregnenolone 200 mg was given intramuscularly day from Nov 18 to Dec 31 (total 8 2 g), no local ions occurred There was gradual relief of pain during ind week of treatment, and on Nov 28, 10 days after ing pregnenolone, she walked unaided for the first time nsion of the left knee was now 170° From this time er walking rapidly improved, and by the end of December ould walk without a stick and with only a slight limp ovement had taken place in the wrists, although move- s were still a little restricted and painful Her finger s were obviously less swollen. The skin of the hands ver, remained moist to the touch. Averages of serial readings (mm in 1 hour) for the months from June to December were June 82, July 66, August 76, Sept ember 59, October 59, November 46, and December 37

She was discharged from hospital on Jan 6 Since then improvement has been maintained, and functional capacity has continued to increase despite the absence of treatment Extension of the left knee remains limited to 170° The B S.R has stayed fairly constant at 30–40 mm in 1 hour

Case 10—In this case, that of a man aged 35, rheumatoid arthritis began fairly acutely in December, 1947, previously he had been subject to frequent attacks of tonsillitis, and his throat has continued to be somewhat sore each morning The arthritis became worse during 1948, and in September of that year he was compelled to cease work as a potter's dipper During 1949 he had two courses of gold therapy (total quantity unknown), with only temporary improve ment During this period he was also experiencing epi gastric pain 2 hours after food, relieved by food and alkalis In September, 1949, his doctor referred him to hospital with a view to tonsillectomy

At this time there was involvement of multiple peripheral joints, with soft-tissue swelling, pain, and tenderness, wrist movements were restricted and elevation of the right shoulder was reduced by about 25° The knees and ankles were painful on movement and the ankles were swollen, the range of movement, however, was full A barium meal showed a chronic juxtapyloric ulcer It was decided to postpone tonsillectomy until he had had a course of medical treat- ment for the ulcer

He was admitted to a medical ward and after 5 weeks on a routine Sippy régime the ulcer could no longer be demon strated radiologically, he was discharged on Nov 17, 1949, with a view to readmission later for tonsillectomy During his stay in the ward there was no improvement in his joint disease, which appeared to be progressing steadily His average B S.R at this period was 31 mm in 1 hour

During December 1949, and January, 1950, the joint condition continued to deteriorate, both knees now became swollen with increasing pain and great difficulty in walking By January his B S R had risen to 60 mm in 1 hour It was decided to include him in the more extended trial of Δ_5 pregnenolone, and at the beginning of February he was again admitted to hospital.

The condition of his joints had deteriorated appreciably since September, 1949 In particular, abduction at the right shoulder was now limited to 90° (almost wholly due to scapular movement) There was effusion in both knee joints larger on the left (circumference of the right knee $14^1/_2$ in., and of the left knee 15 in) with limitation of flexion to 55°on the right side and 65° on the left, and of extension to 170° on the right side and 150° on the left At each wrist the total range of move ment was limited to 80° His grip in the right hand (dynamo meter) was 0 kg and in the left 10 kg He could wash and feed himself but combing his hair with the right hand was difficult He could just walk to the toilet unaided, but with considerable pain His average B S.R. during the preliminary period of observation was 60 mm in 1 hour Radiographs of his joints showed minimal changes there was osteo porosis with early erosion of the cartilages of the wrist joints, and some osteoporosis at the interphalangeal joints His condition did not change during the month before pregnenolone injections were started

In the 3 days after pregnenolone therapy was started, there was appreciable symptomatic relief At the end of a week elevation of the right shoulder was full walking was begin ning to be easier, and finger, wrist, and knee joints appeared less swollen This improvement continued until the 'control' injections were substituted 1 week after these began he complained of returning pain in all joints and at the end of 2 weeks' elevation at the right shoulder was again limited to 90° 3 days after pregnenolone injections were re started, improvement reappeared, and at the end of a week the right shoulder movements were again full At the end of the second course of pregnenolone injections, he stated that he felt better than at any time since his arthritis had begun, his only complaint was of some pain in the feet on walking which appeared to be due to pes planus Movements at the right shoulder were now full The wrists were not swollen or tender, and the range of movement was 110° on the right side and 120° on the left side Grip (dynamometer) amounted to 50 kg on the right side and 55 kg on the left In both knee joints effusions were still present but the circumference of each was now 14 in. and the range of movement had now

their squeezing a rubber bulb connected to a mercury manometer The circumference of affected knee joints was also recorded In every case measurements were made once weekly by each of us independently

After the initial period of observation, all the patients received pregnenolone intramuscularly in an initial dose of 300 mg, followed by 200 mg daily In the seven cases treated during the second stage of the trial this treatment was continued for 3 weeks At the end of this period, injections of oil containing no pregnenolone were substituted, as a control This was done without the knowledge of the patients or of the nursing staff who were giving the injections This "control" injection was continued once daily for 2 weeks A second period of pregnenolone injections was then started, and this time the pregnenolone was given in combination with ascorbic acid (1 g) and hyaluronidase (1000 units), all three being administered simultaneously from the same syringe These injections were continued for a further 2 weeks

It was decided to employ a "control" period on the same cases in the middle of the trial rather than to have a separate series of control cases, on account of the difficulty of finding strictly comparable cases in this disease, which presents a complex clinical picture We felt that if Δ_5 pregnenolone had in fact any true cortisone like activity, any cases which had improved during the initial treatment period should show a tendency to relapse during the control period and improve again when pregnenolone injections were resumed Except for routine analgesics, no other therapy was employed during the trial

RESULTS

Objective Improvement—Of the ten cases treated by intramuscular injections of Δ_5 pregnenolone, three showed significant, measurable, objective improvement Two of these cases were treated during the preliminary trials (when no control period was employed) In one of these two cases—probably both—there is considerable doubt whether the improvement can be directly attributed to the pregnenolone therapy, for reasons which will be discussed further below In the more extended trial, only one of the seven cases showed objective improvement Brief case histories of these three patients are given below

DATA ON ONE CASE OF ANKYLOSING SPONDYLITIS AND NINE CASES OF RHEUMATOID ARTHRITIS TREATED WITH Δ_5 PREGNENOLONE

Case no	Sex	Age (years)	Duration of disease (years)	Stage of disease*	BSR (Westergren mm in 1 hr)		Total dose of pregnenolone (g)	Local reaction	Objective improvement
					Before treatment	After treatment			
1†	M	27	6		54	45	3	Slight	+
2	F	18	1	2	46	37	8 2		+
3	F	32	10	4	32	28	6 8	Mod severe	—
4	F	50	6½	3	45	52	6 1	Severe	—
5	F	50	4	2	76	72	6 1		—
6	F	65	4½	4	44	38	3 7	Very severe	—
7	F	38	2	2	88	102	6 1	Nil	—
8	F	41	12	4	98	104	6 1		—
9	F	50	1½	3	65	72	6 1	Mod severe	—
10	M	35	2	2	60	62	9	Nil	+

* Classification of Steinbrocker et al (1949)
† Ankylosing spondylitis

Subjective Improvement—When the more trial was begun, six of the seven cases reported immediate improvement They all described appr reduction in pain and a subjective sense of mobility in the affected joints which was marked about 1½ hours after each injection was With one exception, however, no objective could be demonstrated with the goniometer or tape measure One of the patients (case 8), who had been bedridden for 2 years, walked a few steps with help at the end of the 1st week of treatment There was, however, no convincing objective change in any of her joints and she was unable to repeat the performance the following week despite the continuance of pregnenolone injections Moreover, in most of the cases the subjective improvement 1½ hours after the injections continued during the period when the control injection was being used In no instance could the sense of subjective improvement be said to amount to euphoria, even in those cases showing objective improvement

Reviewing the period of treatment as a whole, with the exception of case 10, the enthusiasm of the patient was greatest during the first 2 weeks, and waned without obvious cause during the 3rd week of pregnenolone administration It remained substantially the same during the period of "control" injections, and certainly there was no reawakening of enthusiasm when pregnenolone injections were resumed

Toxic Effects—No general toxic effects were observed which could be attributed to the pregnenolone One of the earlier cases (case 2) developed a recurrent symmetrical purpuric eruption on the legs during treatment It was clear from the history, however, that there had been one or more similar attacks before pregnenolone was administered, and the rash disappeared spontaneously despite the continuance of treatment

Local reactions, on the other hand, occurred in seven of the cases and were severe in five These reactions, which appeared at the injection sites after a latent interval of 3 weeks, consisted of red, brawny, indurated swellings, which were extremely tender to touch. These swellings were very painful, and in one instance (case 8) prevented the second course of pregnenolone injections from being given In four cases the reactions first appeared at the end of the initial 3 weeks of pregnenolone injections and tended gradually to fade during the period of control injections It was partly for this reason that hyaluronidase was given during the second period of pregnenolone injections It was hoped that by hastening absorption hyaluronidase would lessen the tendency to local reaction Unfortunately it made no difference, for reactions reappeared at fresh injection sites in each of the previous reactors 1 week after injections were resumed Sensitisation to the solvent has not been eliminated as the cause of these reactions, which would certainly constitute a serious objection to continued intramuscular administration of this compound by the method described

CASE HISTORIES

The principal facts about each of the ten cases are shown in the table The following are brief case histories of the three patients who showed objective improvement

Case 1—A man, aged 27, began to have pain in the lumbar region during the summer of 1943, while he was serving in the R.A.F Ankylosing spondylitis was first diagnosed definitely at the end of 1944 and he was then given a course of deep X ray therapy, with considerable benefit In October, 1 he was discharged from the R.A.F with a 30% disabil pension During 1946 pain appeared in the dorsal spine and he had a second course of deep X ray therapy, with much relief By the end of 1946 although his back very stiff, all pain had gone, and early in 1947 his disabil was reassessed at 20% He remained improved during 1 but early in 1948 his hip joints became involved and du

t 12 30 A.M., on May 18, the patient was admitted to the gow Royal Maternity and Women's Hospital in an emely shocked condition Her pulse was imperceptible her blood pressure 50/40 During the next two hours ints of plasma and 2 pints of blood were administered pulse rate slowly diminished to 100, but twelve hours after nission the blood pressure was still only 70/40, though the e rate had dropped to 96 During the day the patient nited 8 oz. of fluid Fluid intake by mouth was satisfactory urinary output was very low

urse of Illness

May 19—Her pulse rate diminished gradually to 88, the blood pressure did not rise beyond 90/60 Despite adequate fluid intake urinary output remained low e urine contained 2 5 parts of albumin, and the blood a level was 141 6 mg per 100 ml In the evening 200 ml 10% glucose and 1 litre of sodium sulphate solution were ministered intravenously

May 20—The patient was still very ill Hiccup and usea were troublesome, and she vomited 3 oz of fluid e blood pressure was 90/70 and the pulse rate 70–80 rinary output improved, but the blood urea was 162 mg r 100 ml Hæmoglobin was 7 7 g per 100 ml

May 21—Hiccup was almost constant, and slight jaundice peared The blood pressure rose to 124/80, and the inary output improved slightly The blood urea, however, ill continued to rise and reached 173 mg per 100 ml

May 22—Jaundice had deepened, and the breath was fensive The blood pressure fell once more to 90/70, the rinary output diminished and nausea and vomiting were gain troublesome The blood urea level remained stationary t 173 mg per 100 ml. Hæmoglobin was 8 1 g per 100 ml he urine now contained only 0·5 parts of albumin (Esbach)

May 23–25—During the next three days the clinical ondition remained stationary, but the blood urea continued o rise and by May 25 had reached 210 mg per 100 ml The lasma gave a positive immediate direct and indirect van den Bergh reaction, the icterus index was 16, and the plasma ontained 7 units of bilirubin The blood pressure rose to 10/70 and the urinary output rose once more to 16 oz

May 26—Vomiting became more severe, the urinary output ell once more, and the patient was rather drowsy Only a race of albumin was present in the urine, but the blood rea was now 226 mg per 100 ml

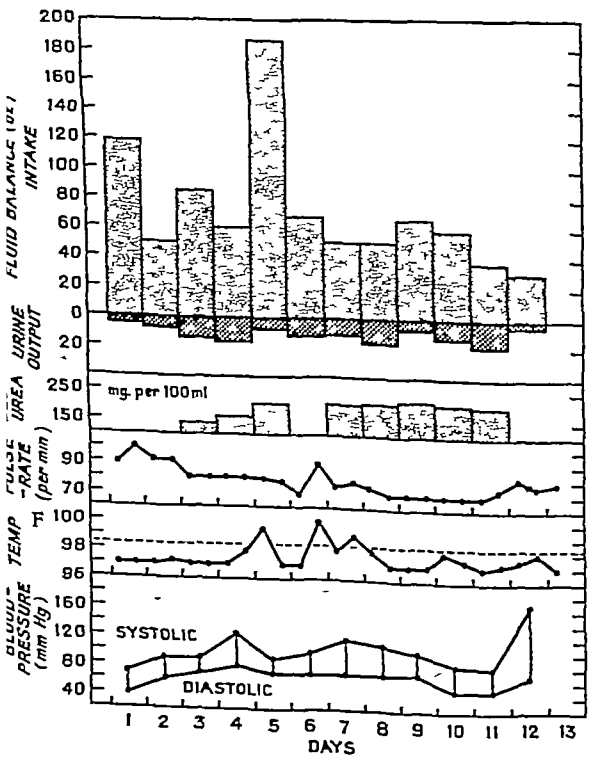


Fig 1—Findings in case 1

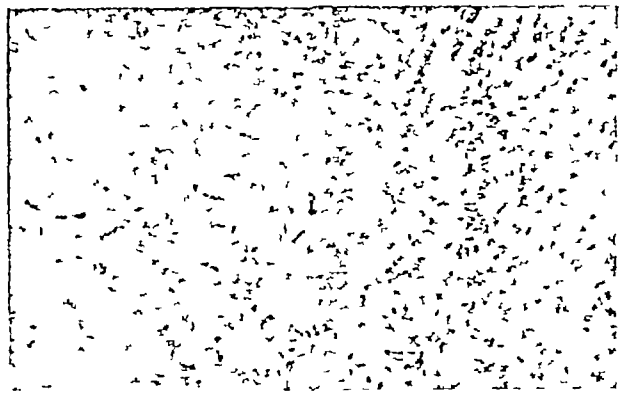


Fig 2—Liver (case 1) showing gross central necrosis of anoxæmic type. (Hæmatoxylin and eosin) (× 160)

May 27—The jaundice was now lessening, but the patient was more drowsy The blood pressure fell again to 85/50 Vomiting increased, but the urinary output was, if anything, improved The plasma phosphatase was 15 9 units per 100 ml and the blood urea 219 6 mg per 100 ml

May 28—The patient was very drowsy, though the blood urea had dropped to 210 8 mg per 100 ml The urinary output rose to 18½ oz, but the blood pressure was only 80/50

May 29—Slight nasal bleeding occurred, and the patient was much weaker Vomiting continued and the urinary output fell The plasma lipoid phosphorus was 12 8 mg, and the plasma amino acids 13 9 mg per 100 ml The blood-pressure was 110/70

May 30—The patient was semiconscious, and hæmorrhage occurred from nose and mouth The pulse was poor and irregular, and at 1 35 P.M. death took place

Fig 1 shows some of the main findings

Necropsy Findings

The body showed well marked general pallor, and the feet and ankles were œdematous The right side of the *heart*, which weighed 380 g, was full of clot resembling red-currant jelly The left side was empty On the wall of the left ventricle just below the aortic valve was a small sub endocardial hæmorrhage The *respiratory passages* were clear, and there was no sign of inflammation. The *liver* was much enlarged, weighed 2400 g, and showed a general pallor In contrast to this pallor, however, were irregular patches of subcapsular congestion over the upper surface and on the cut surface The lobular markings were blurred, and there were numerous tiny areas of intense yellow opaque pallor which were obviously necrotic The gall bladder was normal. No significant change was seen in the spleen, which weighed 200 g and was firm and of normal colour with distinct malpighian bodies The *kidneys* (right 340 g, left 300 g) were much swollen There was a little congestion of the stellate veins of the capsule, but the kidney substance was extremely pale The cortical markings were very indistinct and in many places had disappeared Numerous small superficial hæmorrhages were present on the posterior surface of the *uterus* These had spread along the surface of the tubes, and there was well marked hæmorrhage between the layers of the broad ligament on both sides The *brain* was very pale and œdematous but otherwise normal There was no sign of damage to the *pituitary gland*

Microscopical Findings

No gross abnormality was seen except in the liver and kidneys

Liver—The hepatic parenchyma showed conspicuous changes The cell columns were widely separated in all areas, and the cells appeared shrunken There was no gross congestion, and the changes suggested interstitial œdema In numerous sites there were large areas of healing necrosis involving middle and central zones of lobules, and in all other lobules there was degeneration of the cells surrounding the central vein. The necrosis was of coagulative anæmic type, and the remains of liver cells were seen Much of the tissue, however consisted of pigmented macrophages, fibroblasts, occasional polymorphs, and thrombus material (fig 2) Some of the necrotic areas had undergone more complete healing and the dead material had disappeared

increased to flexion, right 35° and left 45°, and extension, right and left 170° His B S R, however, remained between 60 and 70 mm in 1 hour

He was now put on to a maintenance dose of 100 mg twice weekly, after 2 weeks he again began to complain of returning pain and stiffness, especially in the right shoulder The dose was therefore raised to 200 mg thrice weekly, and a week later his symptoms had again disappeared

DISCUSSION

Davison and Koets (1949) first described the use of Δ_5 pregnenolone in the treatment of ankylosing spondylitis, and they claimed favourable results They administered the steroid intramuscularly, dissolved in a vegetable oil, as in this series Owing to the scarcity of the drug we have been able to treat only one case of ankylosing spondylitis, and therefore do not feel able to comment on its value in this condition Perhaps, however, it should be pointed out that our patient received altogether only 3 g, and that his improvement has not only been maintained, but has continued for several months since injections were stopped One must, therefore, be very cautious about attributing his improvement to pregnenolone therapy

More recently, Freeman et al (1950) have claimed beneficial effects with Δ_5 pregnenolone in the treatment of rheumatoid arthritis They treated a series of thirty cases, administering the drug orally in an average dosage of 500 mg daily They claim that of their thirty cases, fifteen showed major objective improvement In our series the compound was administered parenterally in doses of 200 mg daily, and it may be questionable how far the results in the two series are comparable In our series of nine cases of rheumatoid arthritis, however, only two showed objective improvement It was clear from observation during the "control" period that subjective improvement could be largely discounted Moreover, a critical examination of the history of case 2 throws some doubt on the correctness of attributing her improvement to pregnenolone therapy Although her clinical condition had remained substantially unchanged for several months before pregnenolone therapy was begun, the monthly average value of serial B S R readings was tending to fall steadily during this period This might well have presaged a spontaneous clinical remission which happened to coincide with therapy—a view supported by the absence of relapse when pregnenolone therapy was discontinued On the other hand, the behaviour of case 10 strongly suggests that this patient's improvement was directly due to pregnenolone therapy When treatment was begun he showed early subjective and objective improvement During the period when, unknown both to him and the nursing staff, "control" injections were given, he relapsed both subjectively and objectively, and as soon as pregnenolone therapy was resumed, he improved again Moreover, when an attempt was made later to reduce the dose, he again relapsed, and he again improved when the dose was increased However, although his clinical improvement was certainly striking, the remission was not complete, for effusion still persisted in both knee joints and the B S R remained unchanged

While it would be unwise to draw any dogmatic conclusion from so small a series, it seems clear that, at least with the dosage we employed, Δ_5 pregnenolone is unlikely to be widely applicable in the treatment of rheumatoid arthritis Whether better results would be obtained with heavier dosage is uncertain With the technique we used, it is fairly certain that local reactions would quickly prohibit any increase If, as is claimed by Freeman et al (1950), pregnenolone is readily absorbed when given by mouth, a further trial, employing a higher dose by this route, would perhaps be worth while Any such trial must however, include objective and recordable criteria for assessing [illegible] peutic efficacy, and it should also include a "[illegible] period, either before or during the trial

SUMMARY

One case of ankylosing spondylitis and nine cases [illegible] rheumatoid arthritis have been treated by intr[illegible] injection of Δ_5 pregnenolone acetate in oil

Objective improvement was evident in the case [illegible] ankylosing spondylitis and in two of the cases of rheumatoid arthritis In two of these three cases, however, [illegible] is questionable whether the improvement can [illegible] attributed to the pregnenolone therapy

Local reactions occurred in seven of the cases, [illegible] were severe in five

Acknowledgments are due to Bengers Laboratories L[illegible] for supplies of the steroid compounds used in this investigation

ADDENDUM

Since this article was written, Guest et al. (19[illegible]) have described seventeen cases of rheumatoid arthritis treated with intramuscular injections of pregnenolone. One case of rheumatoid spondylitis improved objectively and subjectively

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PUERPERAL URÆMIA DUE TO ACUTE UPPER-NEPHRON NEPHROSIS

REPORT OF THREE CASES

A D T GOVAN
M B Glasg, Ph.D Birm, F.R.F.P.S
DIRECTOR OF RESEARCH, GLASGOW ROYAL MATERNITY HOSPITAL

I MACGILLIVRAY
M.B Glasg, M R C O G
GARDINER RESEARCH SCHOLAR, DEPARTMENT OF MIDWIFERY GLASGOW UNIVERSITY

NOT much has been published on puerperal urema[illegible] and it is only within recent years that a detailed clinic[illegible] pathological study of this condition has been mad[illegible] Nevertheless in a short time opinions about its aetiolo[illegible] and pathogenesis seem to have become rather fix[illegible] At present attention is confined to two lesions thoug[illegible] to cause puerperal uræmia—bilateral renal corti[illegible] necrosis and the so-called lower nephron nephro[illegible] Indeed, in a recent discussion on the subject at [illegible] Royal Society of Medicine (1949) it was tacitly as[illegible] that no other lesion is even encountered

The following cases are of interest in that they exhib[illegible] a fairly definite clinical syndrome associated with [illegible] acute lesion of the upper nephron

FIRST CASE

Mrs A, 2 gravida, had always been well and had no histo[illegible] of renal or hepatic trouble or relevant family illness February, 1942, she had given birth to a full time fem[illegible] child

In 1948, when she was 36 years old and 35 weeks pregna[illegible] she delivered herself spontaneously of a 5½ lb fem[illegible] infant at 10 10 P M on May 17 The placenta was expell[illegible] at 10 20 P M, and the patient was given 'Pituitrin' 0 5 [illegible] plus 'Neo Femergin' 1 ml immediately A moder[illegible] postpartum hæmorrhage occurred, and another 0 5 ml pituitrin was given at 11 P M Despite this treatment the ute[illegible] remained flabby and bleeding continued, and at 11 30 P[illegible] Omnopon gr ½ was given

ver—The microscopical changes were similar to those in case 1, but were obviously not of such long standing central and middle zones of the lobules were necrotic, in many cases only the last four or five cells of the cords cent to the portal tracts had been spared The necrosis of anæmic type and most advanced in the central zones, re only the "ghosts" of cells remained In the mid e the cells were rounded off and bright pink with pyknotic lei.

idneys—Changes were of two main types In the outer tex there were many wedge shaped areas of typical cortical rosis, due to thrombosis of afferent vessels In the tres of these areas all structures, tubules, and vessels e necrotic, but nearer the periphery the distal parts of the hrons seemed to have survived Mitosis was seen in the thelium of a few tubules (fig 5) Hæmoglobin and ummoid casts were fairly common in these tubules, and ew contained the ghostly outlines of red cells The non crotic areas were entirely different The glomeruli were ther large but of average cellularity The capillaries were tent but showed the thickening typical of toxæmia of egnancy The proximal tubules in association with these omeruli showed changes similar to those in case 1 Each omerulus was surrounded by a cluster of first convoluted bules lined by swollen hydropic epithelium, with basal knotic nuclei (figs 6 and 7). Some of the second con luted tubules contained debris but were otherwise healthy he tubules of the medulla were dilated, and many contained sts there was severe œdema of the surrounding connective ssue The arteries supplying the necrosed areas of the

Fig 5—Tubules at edge of necrotic area (case 2) showing mitosis evidence of regeneration. (Hæmatoxylin and eosin) (× 600)

ortex contained hyaline pink thrombus, which had obviously een present for a considerable time

THIRD CASE

Mrs C, 7 gravida, aged 39, was admitted to Robroyston Hospital, at 10 30 P M, on March 31, 1948, as a case f concealed accidental hæmorrhage Her previous obstetric istory was without incident She had given birth to ix full time children, all alive and well. There was a ague history of what may have been an attack of rheumatic ever in childhood but otherwise she had always been healthy Nothing significant was noted in her family history

The present pregnancy had been uneventful until a month efore admission to hospital, her legs and ankles became wollen. At 8 P M. on March 31 she was seized with continuous cute abdominal pain. There was no sign of bleeding, but here was much vomiting

On admission she was collapsed pale, and cold, with a apid feeble pulse gross œdema of legs and feet, and less evere generalised œdema She still complained of abdominal ain, and her abdomen was tense She was given morphine gr $^1/_4$ and an intravenous plasma drip was set up 1 pint was run in She was very restless and still complained of ain, and a further gr $^1/_6$ of morphine was given. 1 pint f blood was then given (group A2)

Course of Illness

April 1—At 12 20 A.M there was a gush of blood and liquor Fairly free bleeding occurred No uterine contractions could e felt, and pituitrin 0 25 ml was given twice At 12 55 A.M. stillborn child was delivered, quickly followed by the

Fig 6—Glomerulus of inner cortex (case 2) surrounded by first convoluted tubules showing hydropic degeneration Second convoluted tubules are relatively healthy (Hæmatoxylin and eosin) (× 160)

placenta and a large retroplacental clot The fundus was firm, and very little bleeding took place thereafter The patient was catheterised before bleeding occurred at 12 20 A M but the bladder was apparently empty Later in the day she improved somewhat, but her general condition was still poor, with blood pressure 110/60 1 oz of urine containing albumin and blood was obtained by catheter during the twenty four hours 72 oz of fluid by mouth was taken satisfactorily, but there was some sickness In the afternoon 29 oz of 50% glucose-saline solution, plus 1 pint of 10% glucose saline solution were given intravenously Œdema was massive and generalised

April 2—Only 4 oz of urine was passed, despite adequate fluids by mouth, and the general condition remained stationary Blood pressure 120/70 Pulse rate 115

April 3—Vomiting was now more troublesome 5 oz of urine was passed 2 pints of 5% sodium sulphate solution and 1 pint of 50% sucrose solution were given intravenously

April 4—Vomiting was very frequent A further pint of 5% sodium sulphate solution was given intravenously 16 oz of urine was passed, but the general condition was very poor Blood pressure 125/70 Pulse rate 60

April 5—There was no change in the patient's condition Vomiting continued Urinary output fell to 12 oz

April 6–8—Conditions remained unaltered The urinary output remained steady at 15 oz Vomiting was still severe and on April 8 $^1/_2$ pint of blood was administered

April 9—The urinary output improved, 23$^1/_2$ oz being voided Vomiting continued Blood urea 340 mg per 100 ml Hiccup occasionally

April 10—Further vomiting Urinary output fell to 19 oz. Hiccup troublesome 1 pint of 20% glucose saline solution was given Patient drowsy

April 11—33 oz of urine was passed The patient was not comatose Late at night she had several convulsions She died at 3 20 A M on April 12

Fig 8 summarises the more important changes during her illness

Fig 7—Hydropic epithelium (case 2) Note resemblance to fig 3 (Hæmatoxylin and eosin.) (× 600)

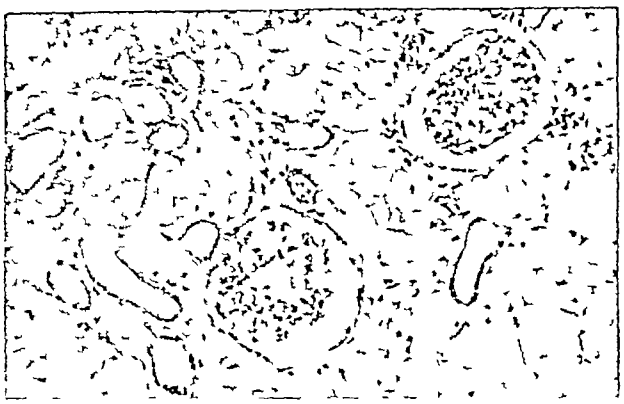

Fig 3—Renal cortex (case 1) showing hydropic degeneration of first convoluted tubules Some of second convoluted tubules are dilated (Hæmatoxylin and eosin) (× 160)

Kidneys—No abnormality was found in the glomerular tufts, which were of normal size and cellularity and with patent capillaries In a few places the epithelium lining Bowman's capsule was swollen and pale The greatest changes were seen in the first convoluted tubules and broad descending limbs of Henle The epithelial cells of these tubules were grossly swollen (fig 3) and colourless, they seemed to consist of sacs of water covered by a thin film of finely granular cytoplasm The nuclei were very small and dark In some cells the nuclei were absent, but there was no suggestion of acute necrobiosis Most of the second convoluted tubules (fig 3) were dilated and lined by flattened epithelium A few contained pigmented casts The remainder of the tubules appeared to be comparatively normal

SECOND CASE

Mrs B, 2 gravida, aged 22, was admitted to Robroyston Hospital, Glasgow, at 6 30 P M on Feb 6, 1948 She had always been healthy, and there was nothing of note in her personal or family history In 1946 she had had a normal full time pregnancy The present pregnancy had been uneventful until two weeks before admission, when her ankles became grossly swollen The patient then attended her doctor, but there is no note of blood pressure or urine findings She was then 26 weeks' pregnant During the afternoon of Feb 6, 1948, she was seized with acute continuous abdominal pain At 5 P M she delivered herself of a stillborn child A large blood-clot was passed with the placenta, which presented a well marked central depression After delivery there was a considerable hæmorrhage

On admission she was pale and felt cold Her pulse rate was 100 and respirations 23 per min, but her temperature was normal Her blood pressure was 100/40 By this time the uterus was firm and bleeding was very slight She received 1 pint of plasma followed by 1 pint of blood and improved considerably

Course of Illness

Feb 7—General condition poor Further transfusion of 1 pint of blood Blood pressure increased to 100/60 Nausea and vomiting in the evening During the day 20 oz of urine was passed The temperature rose to 100°F

Feb 8—Her hæmoglobin being only 25%, a further pint of blood was given The blood pressure by this time had risen to 120/80, but her general condition was still poor and her temperature was 100 2°F A further 20 oz of urine was passed

Feb 9—No improvement was shown, and only 15 oz of urine was passed The temperature was normal or even slightly subnormal The patient took 38 oz of fluid by mouth

Feb 10—Sickness was once more troublesome The blood pressure was 130/100 56 oz of fluid was taken by mouth, but no urine was passed, and therefore a continuous intravenous drip was set up, giving 25% dextrose solution and $2^1/_2$% sodium sulphate solution alternately, 1 pint of the dextrose solution and 2 pints of the sulphate were administered

Feb 11—Only 5 oz of urine was obtained by catheterisation 1 pint of 25% sucrose solution and 2 pints of $2^1/_2$% sodium sulphate solution were given by intravenous drip during the day There was no improvement in the patient's general condition The blood urea was 85 mg per 100 ml and the blood pressure 156/90

Feb 12—Oliguria persisted, and only $4^3/_4$ oz of urine passed 22 oz of fluid was taken by mouth, and 1 5% glucose solution plus 2 pints of $2^1/_2$% sodium sulphate solution were administered by intravenous drip V was now severe and nausea almost constant

Feb 13—The oliguria seemed to disappear, 16 oz. of urine was passed and 26 oz of fluid was taken by mouth. V persisted and the blood urea was 304 mg per 100 ml., urea 0 57 g per 100 ml, and plasma proteins 5 9 g. per 100 ml

Feb 14—Oliguria returned, and only 6 oz. of urine was obtained by catheter The patient was very drowsy and had two fits 200 ml of 50% dextrose solution was given intravenously Sickness became less

Feb 15—Only 4 oz of urine was passed, and the patient had several convulsions Her blood urea level was 364 mg per 100 ml, and she was comatose

Feb 16—The coma gradually deepened, and the patient's condition rapidly deteriorated Nevertheless she passed 35 oz of urine during the day The blood urea was 465 mg per 100 ml Death took place early next morning

The main findings are shown in fig 4

Necropsy Findings

The body showed much pallor and gross œdema of the lower limbs The *heart* was flabby and pale and contained agonal clot in all its cavities no other abnormality was found There was basal congestion of both *lungs*, with some œdema but no sign of pneumonia The *liver* was enlarged, its surface was marked by serpiginous lines of hæmorrhage enclosing irregular areas of opaque yellow tissue Similar changes were seen on the cut surface No abnormality was found in the spleen, and the intestinal tract appeared normal Both *kidneys* were enlarged, their capsules stripped easily, leaving a smooth surface There was general pallor, but many parts of the surface showed tiny irregular areas of congestion. On the cut surface these areas of congestion were wedge shaped. The appearances suggested patchy cortical necrosis The remainder of the renal parenchyma was extremely pale, and the differentiation between cortex and medulla was lost The *uterus* was well contracted and the endometrial surface healthy On the *peritoneal surface* posteriorly there were large splashes of hæmorrhage, which however, were superficial and did not extend into the myometrium

Microscopical Findings

Material was taken from the organs and fixed in 10% formol saline solution The main changes were found in the liver and kidneys

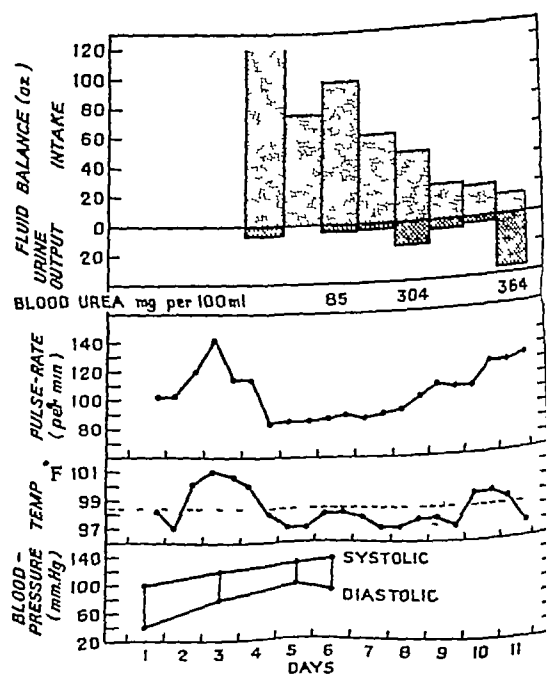

Fig 4—Findings in case 2

changes suggested a degeneration of gradual onset ceeding to necrobiosis It seems unlikely that this s directly due to the initial shock, but possibly the al degeneration was related to the subsequent tabolic changes In case 1 at least it seems difficult ignore the part played by hepatic necrosis A week er the original phase of shock the patient's plasma ve an immediate direct van den Bergh reaction the sma bilirubin was 7 mg per 100 ml, alkaline phos atase measured 15 9 units, and the day before death r plasma amino acid nitrogen was 13 9 mg per 100 ml has been known for some time that liver function is uch upset by severe shock (Blalock and Mason 1936, ngel et al. 1944 Frank et al. 1946)

The renal lesion is peculiar, and the only illustra on of a similar change we have found is in Bell's (1936) xtbook Bell states that this lesion is found in cases incompatible transfusion where cast-formation is bsent or insignificant Liver damage is known to ccur in some cases of mismatched transfusion, but nfortunately Bell makes no reference to the liver here was no suggestion of incompatible transfusion n our cases All blood for transfusion was carefully ross matched before being administered

It is difficult to say why renal failure should follow lamage to the liver With an organ of such complicated unction the mechanism may well vary from case to case It is noteworthy however that Beattie and Marshall (1944) have reported a considerable improvement in renal function following the administration of choline to patients with renal failure due to liver damage Barclay and Cooke (1945) demonstrated the value of choline in a patient whose symptoms bear some resemblance to those of our cases, and experimentally Christensen (1942) has described hydropic degeneration of the convoluted tubules in some animals suffering from choline deficiency

From the report of Humphrey and Jones (1948) it seems that cases of this kind are not uncommon, and that recovery is not unusual.

SUMMARY

Three cases of puerperal renal failure following shock at parturition are described

All three had similar signs and symptoms, which resembled those described by some workers under the term "hepatorenal syndrome"

Patchy liver necrosis and a peculiar hydropic degenera tion of the first convoluted tubules of the kidney were found in all three cases In two, however, the pathological picture was complicated by a coincidental patchy cortical necrosis

It is suggested that the hydropic renal lesion is related to hepatic insufficiency

The possibility of a choline deficiency should be investigated in cases of this kind

This syndrome is not uncommon in obstetrics

We wish to thank Dr J Hewitt and Dr W C Armstrong for the facilities they have afforded us and for permission to publish these cases

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ENURESIS IN ADULTS AND ABNORMALITY OF SLEEP

ROLF STRÖM OLSEN
M D Wales, D P.M

PHYSICIAN SUPERINTENDENT, RUNWELL HOSPITAL, WICKFORD, ESSEX CONSULTANT PSYCHIATRIST, SOUTHEND ON SEA HOSPITALS

As far as I can ascertain, the association of enuresis with abnormally heavy sleep has received scant attention The writer of the article on enuresis in THE LANCET (Disabilities series 1949) stresses heaviness of sleep in connection with bedwetting and mentions the relief obtained by taking ephedrine, but I have found no published description of the syndrome of enuresis and hypersomnia In this preliminary communication, based on a study of cases of enuresis in adults seen since 1943, I wish to draw attention to a combination of symptoms forming a syndrome which as a rule was previously most intractable

My attention was first drawn to this abnormality during the war when two men engaged on essential work were referred to one of my psychiatric clinics because they were constantly late at work through oversleeping One had had lifelong severe enuresis, while the other was enuretic in a milder degree These patients, I am sure, would not have complained of their heavy sleep if they had not come into conflict with the authorities Unlike insomnia, excessive sleep is not unpleasant or distressing, and is hardly ever the subject of complaint by the patient The symptom has to be elicited by careful inquiry and history taking, often from relatives, and this is probably why its association with enuresis in adults has hitherto passed unnoticed After the discovery of these first 2 cases I obtained a history of hypersomnia in almost every case (25 out of 28)

SYMPTOMS

Since 1943, 35 cases of enuresis in adults (22 male and 13 female) have been studied at the outpatient departments of the Southend General and East Ham Memorial Hospitals The ages of the patients ranged from sixteen to forty-one years, 8 of them were over the age of twenty five In the first 7 cases of the series the occurrence of hypersomnia was not investigated, and these cases will not be further considered here. Of the remaining 28 patients, 25 had hypersomnia, and 3 had no abnormality of sleep as far as could be ascertained In all these patients the nocturnal incontinence was fairly severe, there being only 2 with a frequency of enuresis of less than once a week

In the 25 patients with hypersomnia the symptoms were all very similar From the psychiatric point of view these patients showed a characteristic absence of anxiety—indeed symptoms of neurosis were rarely present They are level headed, placid, stolid, and imperturbable—in fact often dull The general picture is one of lowered emotional tone As regards sleep, the usual story is that the patient on going to bed falls asleep very quickly, as a rule immediately he puts his head on the pillow The sleep is heavy and dreamless, and very deep in the morning (unlike normal sleep, which becomes lighter at this time), these people are seldom able to hear an alarm clock or people calling them, and usually have to be shaken fairly vigorously before they wake up One man described it as a "knockout" sleep, another stated he did not wake up at the noise of the explosion of a rocket bomb which fell near his house One comment from a third patient was "they have to give me a good shaking, otherwise I would never wake up I have had cold water thrown on me in the morning to wake me up" They are incontinent during this period of heavy sleep, but as a rule it does not

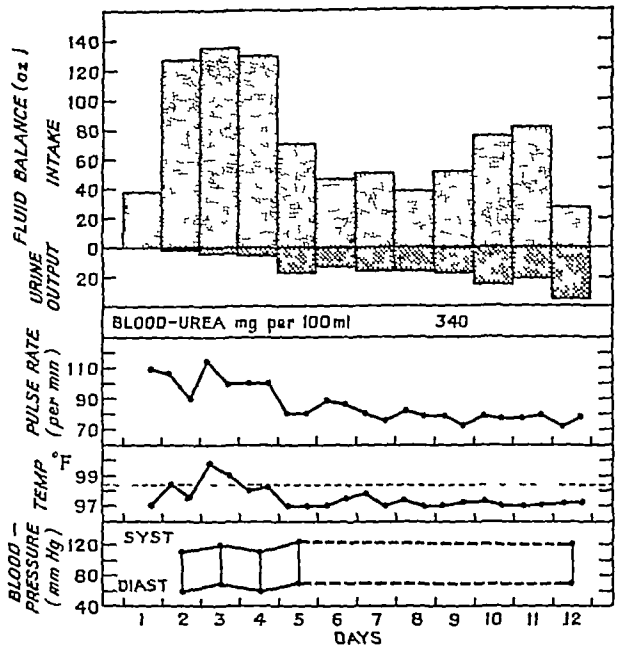

Fig 8—Findings in case 3

Necropsy Findings

The body was slightly obese, and had well marked striæ on the lower abdomen Œdema was severe in the lower limbs, sacral region, and abdomen Slight œdema was present in the hands The face was rather puffy No gross abnormality was seen in the *heart* or great vessels The *lungs* were congested at the bases, but there was no sign of inflammation Nothing significant was seen in the *stomach* and intestines The *liver* was much enlarged and pale In several places there was free blood in small quantities beneath the capsule on the upper surface, and there were irregular yellow areas of obvious necrosis The cut surface showed many similar areas of necrosis in both lobes, with rather irregular congested margins The spleen appeared normal The *kidneys* were enlarged Many spots of hæmorrhage were seen on their surface, and there were occasional small irregular yellowish areas with congested margins The cut surface showed a patchy congestion of the outer cortex with numerous tiny pin point areas of hæmorrhage and small wedge shaped areas of necrosis, obviously a cortical necrosis like that seen in case 2 The remainder of the kidney was extremely pale Nothing of significance was seen in the *suprarenal glands* The *uterus* was very like that seen in case 2 Splashes of subperitoneal hæmorrhage were present on the upper posterior surface and smaller ones on the tubes

Microscopical Findings

Pieces of tissue were selected and fixed as before in formol saline solution Once more the liver and kidneys were the only organs to show any significant pathological change

Liver—Changes were like those seen in cases 1 and 2 Gross necrosis was present in the centres of many lobules

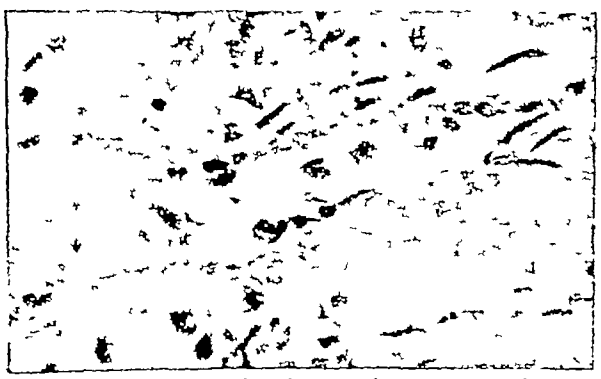

Fig 9—Recanalised thrombosed artery in renal cortex (case 3) (Hæmatoxylin and eosin) (× 600)

The necrosis was of anæmic type, the changes being around the central veins The cells in this area were fragmented, and in many lobules they were in process of appearing Pigmented macrophages and a few polymorphs were present

Kidneys—The pathology of the kidneys was somewhat that seen in case 2, cortical necrosis affecting small areas the outer cortex This necrosis involved small groups glomeruli and their related tubules and vessels. The marked changes were present in the renal vascular system Many of the afferent arterioles were necrotic, and most these were thrombosed The thrombi were partially organized and the vessels recanalised (fig 9) In the deeper cortex the glomeruli were comparatively healthy They larger than normal, and the capillary walls were thickened The related first convoluted tubules showed the changes found in case 2 The lining epithelium was hydropic with small pyknotic nuclei The second convoluted tubules were comparatively normal Pigmented casts were present in the collecting tubules and ducts of Bellini. The medullary interstitial tissue was œdematous

DISCUSSION

These three cases presented a rather similar symptom complex It is unfortunate for our purpose that they were complicated by patchy renal cortical necrosis, but according to all observers (Duff and More 1941) cases of cortical necrosis are remarkable in that the patients recover from their immediate shock and remain symptom free, apart from oliguria, until the later stages of renal failure None of the present patients recovered completely from the shock phase All remained apathetic Nausea, vomiting, and hiccup developed early in the course of their illness and remained troublesome throughout Œdema appeared or, if already present, became worse Oliguria was constant but varied in degree from day to day, and despite increasing azotæmia the urine remained dilute and contained only a small percentage of urea Similarly, albuminuria diminished though uræmia increased The patients *became drowsy* and in the first case there were hæmorrhages from the mucosæ

The course of the illness in these patients is rather reminiscent of that described by Heyd (1924) in reference to some cases of "liver" death *following* surgery of the *biliary tract* Pytel (1937), in *a review* of this condition described a hepatorenal group characterised by a sudden rise in temperature, rapid pulse, nausea, and vomiting Oliguria appears, and the urine contains albumin, red cells, and casts The urinary urea is low despite increasing azotæmia Œdema is common and may become gross The patient becomes drowsy, and hæmorrhage may occur from the mucosæ Boyce and McFetridge (1935) described a similar group without the initial in temperature, and their description would fit the cases reported here Most of the cases described have been associated with surgery of the biliary tract, but Pytel (1937), Dérot (1937), and Wilensky (1939) have described a similar syndrome following non surgical liver damage due to various causes In obstetrics it has been described as a complication of abortion (Balard 1937, Parafe 1936) Humphrey and Jones (1948) have described cases of oliguria following abortion, and the symptoms were almost identical with those of our patients of their patients recovered, and these workers attribute the condition to a lesion of the lower nephron

There was gross hepatic necrosis in all three of the cases, and the appearances suggested that the necrosis dated from the original phase of shock Davidson (1946) have described focal necrosis of the liver in cases of extremely low blood pressure Similarly in cases 2 and 3 the cortical necrosis was advanced and was probably related to the shock phase In many areas there was evidence of healing (figs 5 and 9) On the other hand, in all the proximal tubules of case 1, and in the of cases 2 and 3 not affected by the cortical necrosis

nsted for 10 months She became regularly incontinent the nurse stated that she slept very heavily and had to haken every morning as she did not hear the other patients ing up or talking Before the operation she had never been eavy sleeper or incontinent For the last 8 months the ormal sleep and the incontinence have responded extremely l to amphetamine at night

t is difficult to obtain a very clear picture of the ysiological mechanisms of sleep and micturition, since ich of the evidence is confusing It seems to me, wever, to be established that interruption of the tical pathways to the lower centres, particularly the pothalamus, is important in bringing about deep ep and loss of control of the bladder In cases where other methods of treatment had failed, and where ere was no obvious psychogenic factor, it seems likely at the pathogenesis of the syndrome of hypersomnia id nocturnal enuresis is to be sought in some functional terruption of cortical impulses to the hypothalamus id other lower centres, and that this is alleviated by ie action of amphetamine One can only speculate on here the actual fault lies probably in some inborn ror in the physiology of the cortical neurones

SUMMARY

1 Of 28 adults suffering from nocturnal enuresis 25 ave a history of excessively heavy and prolonged sleep vith difficulty in waking up

2 The patients showed an absence of anxiety and vere free from neurotic symptoms

3 The response of these patients to the administration of amphetamine sulphate at night was strikingly favourable Failure to respond was often due to insufficient losage.

4 These patients were not kept awake at night by the administration of amphetamine

5 The pathogenesis of the syndrome of nocturnal enuresis with hypersomnia is discussed

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EXCRETION OF POTASSIUM AFTER PARTIAL GASTRECTOMY

A W WILKINSON
Ch.M. Edin., F.R C S E

BARBARA H BILLING
B.A. Camb, Ph.D Edin

GABRIELLA NAGY
B Sc Lond

C P STEWART
M Sc Durh., Ph D Edin

From the Department of Surgery in the University of Edinburgh, and the Clinical Laboratory, Royal Infirmary, Edinburgh

IN previous reports (Wilkinson et al 1949, 1950) we have considered the changes in metabolism of chloride, sodium, and nitrogen after surgical operations such as partial gastrectomy Cuthbertson (1936) found, in patients after injuries to bone, that there was an increase in the excretion of potassium and phosphorus which though less than the increase in the excretion of nitrogen and sulphur was related to it in time, he also found that the excretion of sodium was little changed From these and other observations he concluded that the increased urinary excretion of nitrogen, sulphur phosphorus, and potassium after injury was due to the katabolism of tissue, probably muscle Howard et al (1946) have reported that, contrary to these findings, the relationship between the quantities of nitrogen and of potassium, sulphur, and phosphorus is not exactly that to be expected if all the excess of these substances came from the same tissue source—e g, katabolised muscle—and that the relationship does not hold in time, the greatest output of potassium coming in the first twenty four hours Blixenkrone Møller (1949) also found that the greatest amount of potassium was excreted in the first twenty-four hours after operation, and he attributed the loss of potassium chiefly to intracellular dehydration

Disturbances of metabolism of potassium during the immediate postoperative period might have an important bearing on the interpretation of the previously reported retention of chloride, sodium, and water (Wilkinson et al 1949) In view of these conflicting reports about changes in postoperative urinary excretion of potassium it seemed advisable to include observations on potassium excretion in our metabolic studies

METHODS

Five male patients were chosen who had duodenal ulcers and were to undergo partial gastrectomy

The nitrogen balance was studied in each case In addition, the intake of chloride and of sodium was controlled before and after operation, and that of potassium was measured though not kept at any predetermined level. The quantities of chloride, sodium, and potassium ingested daily were estimated from the tables of McCance and Widdowson (1946), check chemical analyses being made from time to time Urine, fæces, and gastric aspirations were collected according to the method already described (Wilkinson et al 1949) Potassium was estimated by the platinic chloride microtitration method of Shohl and Bennet (1928), determining potassium as the iodoplatinate as described by Peters and Van Slyke (1932)

Analyses of certain foods by this method gave figures some 25% lower than those reported by McCance and Widdowson (1946)—e g, milk 119 5 mg against 160 mg per 100 ml This may be due to an actual difference in foods analysed by ourselves and these workers, or it may be due to an incomplete recovery of potassium in our analysis We do not think that the latter alternative is the explanation, since recovery of added potassium was invariably satisfactory (95%) A similar variation between the calculated and analysed potassium content of diets was reported by Howard and Bigham (1945)

RESULTS

Before operation, on an intake of about 3 g of potassium a day, there was a small positive balance After operation the potassium intake was nil for 1–4 days and was then gradually restored to the preoperative level, which was regained in 4–7 days after operation. For 1–3 days after operation the daily total quantity of potassium excreted in the urine rose above the preoperative level in spite of the absence of any intake, but this was succeeded by 5 or 6 days when the daily excretion of potassium was reduced in spite of the resumption of intake On about the 7th or 8th day after operation both intake and urinary excretion of potassium had returned to the preoperative level There were thus 3 or 4 days immediately after operation when potassium was apparently lost from the body, followed by 4 or 5 days when potassium was retained Even if the estimates of the quantities of potassium ingested, as calculated from the tables of McCance and Widdowson (1946), were too high, the figures corrected for this possible error still indicated a retention of potassium for several days after the 5th postoperative day

In two cases daily determinations were made of the urinary phosphorus and sulphur as well as of potassium and nitrogen It was noteworthy that the excretions of potassium and of phosphate followed a parallel course, as did those of nitrogen and of sulphur

disturb them and when they wake in the morning they find the bed wet

TREATMENT

For a long time belladonna and ephedrine were the standard drugs used, but it is now generally agreed that amphetamine or 'Dexedrine' give the best results, in children as well as adults This certainly has been my experience with these adult patients The effect is not only to reduce or abolish the incontinence but also to make the sleep more normal A striking feature common to all these patients has been the extraordinary tolerance of amphetamine a dose which would keep a normal person awake all night would have no effect on their sleep, and even with very large doses they sleep well, some patients report a good night's rest after amphetamine 25–30 mg taken at bedtime Some tend at times to wake up at 2 or 3 o'clock in the morning, when they use the opportunity to empty the bladder, on going to bed again they fall asleep immediately The usual effect, however, is for patients to wake more readily in the morning I have not heard any patient complain of sleeplessness due to amphetamine, and if it is to have the desired therapeutic effect it often has to be pushed Failures are in my opinion due to insufficient dosage With some patients 10 mg at night may be sufficient, others require at least 30 mg The dose is taken when the patient goes to bed after having emptied the bladder

Side effects were so trivial that they could almost be ignored In one case flatulent distension was the subject of complaint, in another a feeling of heat and excessive perspiration was noticed on waking in the morning, and a few patients have felt some dryness of the mouth

CASE HISTORIES

Case 1 —A married man, aged 32, a railway platelayer, had been a lifelong enuretic 5–7 times a week, he also suffered from hypersomnia He stated 'I am a very heavy sleeper they have to shake me, or I would sleep on A dose of amphetamine 10 mg at night had little effect on either symptom nor did 15 mg The dose was increased to 25 mg on going to bed, the patient slept well, and the enuresis was reduced to once a week during 4 weeks At the end of the fourth week he ran out of tablets, and in the next 7 days wetted the bed six times and slept extremely heavily For the next 6 weeks he took 30 mg nightly, with excellent results On this dosage he sleeps quite soundly but wakes more readily in the morning than he does by nature He was incontinent only twice during this period, once after not taking the tablets A month later the condition remained very satisfactory he had been incontinent only once He is still being followed up

Case 2 —A girl aged 20, single, a comptometer operator, who had been a lifelong enuretic, came to the psychiatric clinic complaining of bedwetting on an average three times a week She had tried various treatments, including psychotherapy, without effect She admitted on inquiry that she was a very heavy sleeper, her relatives had to wake her, or she would sleep on until very late in the morning She never remembered having dreams She was put on amphetamine 5 mg at bedtime, and the following week on 7 5 mg A week later she reported having wetted the bed twice The dose was then increased to 10 mg at night, and during the following 3 weeks had enuresis only once a week The dose was then increased to 15 mg, during 10 weeks she reported no enuresis By now she was sleeping much more lightly and often used to wake at 2 A.M though she would have no difficulty in going to sleep again after having emptied her bladder She has not returned to the clinic

Case 3 —A married man aged 26, a clerk, had been an enuretic since the age of 12, on his first attendance at the clinic he reported having been treated with psychotherapy, phenobarbitone, and ephedrine without effect The bladder had been examined 8 years before, but nothing abnormal had been found He gave a history of excessively deep sleep at night, and also stated 'I can sleep any time and anywhere' He would dream at times Enuresis varied from once to seven times a week, but usually occurred every night After 3 weeks he had been worked up to amphetamine 12 5 mg at night and had improved considerably He was put on 15 mg at night and did not return to the department for 3 months During that period he showed further improvement Sleep was lighter, and bed reduced to once a fortnight Unfortunately we have lost sight of him

Case 4 —A man, aged 26, single, a motor attended the psychiatric outpatient clinic for lifelong enuresis No treatment had had any lasting effect on him and when interviewed he gave a history of incontinence varying from once a fortnight to four times a week. He was quiet and placid, giving no evidence of any neurotic symptoms and was a very heavy sleeper, nothing would disturb his rest and he could not spontaneously wake up early enough It took him a long time to feel wide awake He was at first put on amphetamine 10 mg, and this had some effect after 8 weeks he had had incontinence on three occasions, but still felt rather sleepy in the morning He continued on this dosage for another 10 weeks and was then put on 20 mg at night for 8 weeks This dose usually caused him to wake up during the night, when he micturated and immediately fell asleep again His sleep was now not so heavy in the morning During this period there was no incontinence but he started to complain of flatulent distension The dose was reduced to 10 mg, and over a period of 9 weeks he was twice incontinent and his sleep was a little more heavy He was finally stabilised on amphetamine 15 mg, at night, which did not cause any gastric discomfort When last seen the sleep was more normal and there was no evidence of any enuresis He failed to return to the clinic

These are four typical examples The other cases had a very similar history and the effect of amphetamine has been in every case extremely encouraging—almost specific These patients have not been followed up long enough for a final conclusion to be reached, but sufficient time has elapsed for me to be convinced that amphetamine has had a striking therapeutic result provided one is not too timid in increasing the dose at night From the cases described it will be seen that large doses are often necessary to effect cure or relief No detrimental effects were seen

DISCUSSION

The lateral and possibly the posterior hypothalamic areas are known to be associated with both the sleep waking mechanism and the mechanism of micturition According to Kleitman (1929) sleep is brought about by a functional break between the cortex and the brain stem, particularly the hypothalamus, this break is due, he thinks, to a great decrease in the number of afferent impulses from the sensorium Russell Brain (1939) considered that no part of the normal nervous system acts in isolation in bringing on sleep, but that normal sleep is the outcome of interplay between the cortex and the hypothalamic sleep waking centre Ranson et al (1935) found that stimulation of the hypothalamic region causes contraction of the bladder Cortical lesions, especially those which are bilateral, induce signs of release of the bladder reflexes and an increase in the response to stretch (Miller 1942) Denny Brown and Robertson (1933) maintain that the cortical control of the bladder consists in the inhibition of spinal reflexes The action of the hypothalamic centre for micturition are dependent on the intact motor cortical fibres descending through the internal capsule (Beattie and Kerr 1936) Lesions situated between the midbrain and the floor of the third ventricle cause hypersomnia and it is well known that subcortical tumours in the frontal region may cause both incontinence and excessive sleep After the operation of prefrontal leucotomy the combination of drowsiness, heavy sleep, and incontinence of urine is common during the first week or two, the condition usually clears up, but persists in some cases

Case 5 —A woman, aged 63, was leucotomised in May, 1947 After the operation she was dull, torpid, apathetic, and incontinent She left hospital in August, 1948, but returned in November 1948, in a neglected and apathetic state lacking spontaneity, she would often wet the bed This condition

he quantities involved are of the order which the othesis suggests In the experiments reported here excretion of potassium during the 3 important days unts to about 6 g, which indicates a transfer from ncellular to extracellular compartments of about tres of fluid containing 200 mg of potassium per ml

urther precise measurements are needed to establish hypothesis (or to refute it), but it is perhaps worth ting out that it is consistent with various clinical ervations

Thus, during the postoperative period not only does d accumulate in the inflammatory area but also there i greater tendency than usual towards retention of er, sodium, and chloride, a tendency which, when mal saline solution is given, may lead to the appear e of generalised œdema Whether or not œdema is ually observed in such circumstances depends on ious factors the renal efficiency with respect to the retion of salt and water, the state of nutrition and the acid-base balance, and the volume of saline en The fact that œdema does occasionally develop mportant, as also is the fact that further administration saline worsens the condition rather than improves it both facts point to the existence of an intracellular pletion of water and potassium Also suggestive is e clinical impression that improvement of an established stor ative œdema may be initiated when infusion uids contain potassium as well as sodium salts

Similar changes in the excretion of potassium, sodium loride, nd water after gastro intestinal hæmorrhage th or without closely associated surgical operations ve been observed by Borst and others Borst (1948) s explained these changes as being due to a regulating echanism which maintains a normal cardiac output our own patients the cardiac output was not measured d, as judged on clinical grounds the circulatory state all these patients was good, except for short periods ring operation and for a few hours immediately after it e have not found any published reports of combined servations on cardiac output and renal excretion after ajor operations in man It may well be that an increase cardiac output is a consequence of retention of chloride d sodium, but if this were so it would not explain the ectrolyte disturbance itself On the other hand, it ems equally possible to relate changes in cardiac utput, if they do in fact occur, with the inflammato- eaction in the injured regions

It is a corollary of the hypothesis we have advanced hat determinations of urinary chloride afford no reliable uide to the requirements of salt and water during the nmediate postoperative period, excellent though they re in other circumstances The retention of sodium nd chloride after surgical operation (and probably also other conditions associated with acute inflammation), s part of a general disturbance of water and electrolyte volving intracellular fluid, leads to a decreased urinary xcretion of chloride at a time when, in fact, the extra ellular fluid is increased in volume and its chloride oncentration is not lowered

SUMMARY

The urinary excretion of potassium was measured in ive patients after partial gastrectomy

In spite of the cessation of potassium intake for p to 3 days after operation, the urinary excretion of otassium was increased this was succeeded by a period f 5 or 6 days when the daily excretion was reduced lthough the intake of potassium had been resumed

The relationship of these observations to the previously ecorded changes in metabolism of chloride, sodium, and itrogen is discussed A hypothesis is advanced to explain hese changes in terms of the inflammatory reaction

We wish to thank Sir James Learmonth for providing clinical facilities and for his continued interest in the work the dietitians who provided the controlled diets, and the nurses, without whose coöperation these studies would have been impossible A grant was made to one of us (C P S) by the Medical Research Council for technical assistance and materials and one of us (A W W) has held the Syme Surgical Fellowship of this University during the course of these studies

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Reviews of Books

Research in Medical Science

Edited by DAVID E GREEN PH D and W EUGENE KNOX M D New York and London Macmillan 1950 Pp 492 48s

MEDICINE nowadays lives at close quarters with other sciences, and draws constantly on their findings This book has been compiled by a team of authorities in these other fields nearly all of professorial standing, and most of them American, though there are contributions from England, Australia, and Argentina Many of the contributors are clinicians for as the editors say in their introduction, "a new breed of hybrid investigators has arisen which includes both the clinician who has become an expert in one of the fundamental sciences, and the representative of the fundamental sciences who has become an expert in some phase of medicine" Such hybrids are Prof Lancelot Hogben, F R S, who writes here incisively of the methodology of medical genetics, Dr John Peters, professor of internal medicine at Yale who describes 'differentiation and specialisation of biologic media,' Prof F M Burnet, F R S, who contributes an article on viruses, and the team of three professors, two of them doctors of philosophy and one a doctor of medicine, who discuss the rôle of hepatorenal vasotropic principles in experimental shock The book is intended for medical-students who contemplate research clinicians who are not fully aware of advances in the fundamental disciplines, biochemists who have lost touch with disease processes, and intelligent laymen The last and perhaps even the first may think, as they ruffle the pages, that such a book is not for them there are chemical and mathematical formulæ, awkward terms, and a froth of references left in the wake of every chapter They will be wrong Wherever they open and read they will be astonished to find the language clear, the principles well set out, the message comprehensible This is an achievement on which the editors and their contributors must all be congratulated Human nature being what it is, it is inevitable that with over thirty fine fish in the basket the glutton should still yearn for the few that got away The editors tell us that several important subjects including sex hormones, penicillin, and neurophysiology, are omitted because several pledged contributors failed to find time to prepare their manuscripts Perhaps these call for different angling tactics If the editors find, when a new edition is in preparation that tickling will not serve they should reach for the gaff

Hémoglobine et pigments apparentes

HENRI BÉNARD, professor in the Faculty of Medicine, Paris A GADJOS and M TISSIER chefs de laboratoire Paris Masson 1949 Pp 350 Fr 1350

THE biochemistry of hæmoglobin and its relations has recently been much more thoroughly set out in the monograph of Lemberg and Legge, but this French book is better on the clinical side References are given

POTASSIUM AND NITROGEN BALANCES IN FIVE CASES BEFORE AND AFTER OPERATION

Case no	Greatest loss of potassium in one day (g)	Day of greatest urinary excretion		Duration of loss of potassium (days)	Quantity of potassium lost (g)	Av daily urinary excretion of potassium (g)		Av urinary vol per day preoperative (ml)	Urinary vol on day of greatest potassium excretion (ml)
		Potassium *	Nitrogen *			In control preoperative period	In critical period of 3 immediately postoperative days		
1	2 5	0+1	0+1	2	4 47	2 18	2 43	2200	1080
2	2 7	0+1	0+1	4	7 16	2 03	2 04	1540	1000
3	4 65	0+1	0+4 0+2	3	7 96	2 17	2 65	1090	1100
4	2 82	0+1	0+5	4	6 16	1 97	1 54	1060	910
5	4 1	0	0+3	3	8 46	2 [illegible]	2 82	1660	1200

* 0 = day of operation
x = variable no of days in each case when there was no potassium diuresis

The results of the five cases are summarised in the accompanying table, and the figure shows diagrammatically the general time relationships between the intake of potassium and the urinary excretion of potassium, as well as between the disturbance of metabolism of nitrogen and that of potassium

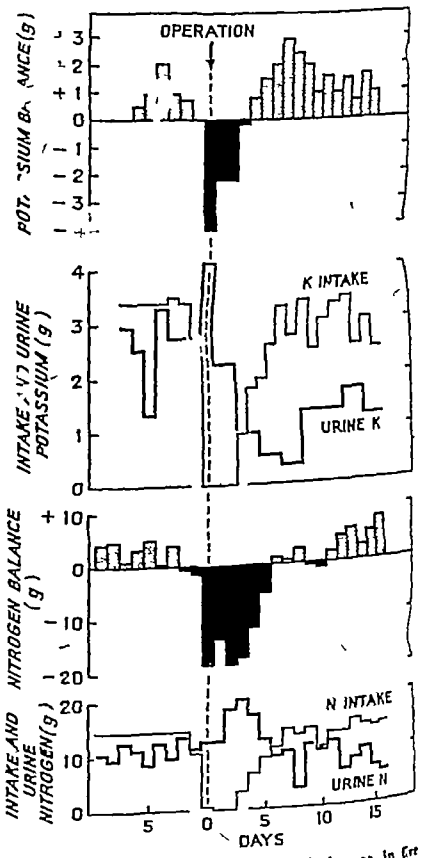
DISCUSSION

The increase in the urinary excretion of potassium which, in spite of a reduction in the potassium intake and in the volume of urine, occurs on the day of operation and the immediately succeeding days is in sharp contrast to the coincident decrease in the urinary excretion of sodium and chloride which occurs in spite of an increase in the intake of these ions The changes in the electrolyte balance seem to be mutually related in that they are all parts of a general disturbance involving many chemical equilibria

The classical observations of Benedict and of Gamble on the effects of starvation on the urinary excretion of nitrogen and potassium indicated that the losses of both nitrogen and potassium were quantitatively related for each gramme of nitrogen lost there was a loss of about 2 5 milli equivalents of potassium, or about 1 g of potassium for each 10 g of nitrogen These ratios are very similar to the quantities of nitrogen and potassium found in normal muscle

The widespread nature of the electrolyte changes is in itself evidence against the simple view that, in the immediate postoperative period there is destruction of tissue (for the sake, perhaps, of protein components, extra katabolism of which is shown by the increased nitrogen excretion) with the liberation of potassium from the destroyed cells and consequent excessive excretion of potassium The time relationships also do not support this interpretation, for the increase in potassium excretion begins on the day of operation—within 6 hours of the operation according to Blixenkrone Møller (1949)—whereas the increase in nitrogen excretion is appreciable only later further, the greatest excretions of potassium and nitrogen do not coincide in time It is possible that some of the extra urinary potassium is derived from destroyed cells, or is associated with protein katabolism (since the cellular proteins exist largely as anions in equilibrium with potassium cations), but, if so, there must be some other metabolic disturbance which is probably the prime cause of the fluctuations in potassium excretion

It might be thought that the renal conservation of potassium after injury is less successful than that of sodium or chloride During the immediate postoperative period not only is there an increase in the amount of potassium excreted, but also, since the excretion of water is diminished at this time, the urinary concentration of potassium is greater than before operation This, coinciding with cessation of intake of potassium, suggests that the kidney is struggling to remove an excess of potassium rather than failing to conserve a depleted supply The most likely endogenous source of the temporary excess of potassium is the intracellular fluid In the early hours after injury an inflammatory exudate is formed in the damaged tissues It may be supposed that for the provision of this exudate there is an acute demand for a fluid containing protein and electrolytes This demand is satisfied primarily from the plasma, and this must lead to the withdrawal of extracellular fluid from uninjured areas Such a withdrawal of extracellular fluid would in turn cause a widespread disturbance in the extracellular intracellular fluid balance in the uninjured tissues, causing the transference of water from the cells to their surrounding medium To restore the osmotic balance electrolytes must also leave the cells along with this water, and the chief intracellular cation is potassium This would add an increase in the potassium concentration to the other disturbances of ion equilibrium in the extracellular fluid, and, as part of the general readjustment, potassium must be passed on from the extracellular fluid to the plasma The end result would be an increased renal excretion of potassium, derived ultimately from normal tissue cells via the extracellular fluid and the plasma



Average nitrogen and potassium balances in five cases before and after operation

The hypothesis of an inflammatory reaction in the damaged tissues leading to depletion of intracellular water and salt—and it is as yet no more than a hypothesis—explains the observed increase in potassium excretion It is also consistent with the coincident retention of water, sodium, and chloride, since the changes in the inflammatory area are followed by a demand for increased extracellular extravascular fluid, a demand which is met partly by withdrawal of fluid from the cells elsewhere and partly from saline solution given intravenously Disturbance of the intracellular fluid is suggested by the increased urinary excretion of phosphate at the same time as the excessive loss of potassium

THE LANCET

LONDON SATURDAY, JULY 22, 1950

Frustration

: the last few years of swift change, each annual esentative meeting of the British Medical Associa- has had a mood and tempo of its own At this 's meeting, which ended last Monday, the mood was lued and the tempo uncertain

emuneration, which has loomed large at earlier ierings, took up little time, representatives agreeing iout demur—though without obvious enthusiasm—Dr WAND's proposal that they should support decision to proceed with plans for general practi- iers to withdraw from the service[1] The General lical Services Committee is seeking to get the better it factor raised from 40% to 70%—a claim involving additional £7 million or so If this claim succeeds, extra money might be used partly to reduce the ximum size of lists while keeping the present maxi- m income steady Such a reduction is very desir- e, but it would do little to help practitioners in " over-doctored ' areas, some of whom have fallen hard times since 1948 Their need calls still—in t, more than ever—for " loading " of the capitation on the first 1000 or 1500 patients Those who are ;otiating for the extra money which would make these ustments possible will evidently do their best to id the open dispute implied by notice of withdrawal, the dispute would almost certainly be referred to ipulsory arbitration, which offers small chance of advantage At the meeting (which is reported on another page), Dr J C ARTHUR declared ' Compulsory arbitration would be most dangerous to us ' The Ministry of Health—and the Treasury—will have to be convinced by negotiation.

More attention was paid at the meeting to the status and work of the practitioner Here the sense of frustra- ion—a word which recurred throughout the debates—was reflected in recurrent, and sometimes pointless, lefiance of the platform, in demands for a larger share by practitioners in the administration of the service, and in the enumeration of various shortcomings scribed to the National Health Service but often dat- ig back much further than the last two years Clearly iost minds were painfully occupied with thoughts of ne falling prestige of the practitioner, so much was nplicit in discussion of topics ranging from remuneration o free change of doctor and clinical assistantships ome at least were alive to the relation between the octor s prestige and the work he does, and one speaker as probably expressing the thoughts of others in eclaring that "unless something is done soon to ipport the general practitioner service, it will be too te" Among the constructive proposals were some or freer access to diagnostic resources, for closer integra- on between practitioner and hospital, and for an over ll review of the whole service Dr GEOFFREY BARBER ientioned that here and there teams of practitioners i groups of six or so have lately acquired premises and set up in group practice, gaining advantages in accommodation, ancillary help and leisure He commended this initiative to others The chairman of the council made it clear that he thought nothing of such makeshift devices his faith is still in experiment with health centres But if there are grounds for believing that the promotion of group practice is an indispensable element in restoring general practice, can we wait for these centres ? Blueprints offer no present comfort Addressing the section of preventive medicine on Tuesday, Prof J M MACKINTOSH remarked that plans for health centres were breaking on the rock of financial competition He would like to see salaries replace payment by number of patients or items of service, for doctors should practise in team and not as rivals Sir SHELDON DUDLEY spoke in the same sense, and they were not contradicted

The representative meeting was made no less uneasy by the systematic lobbying which accompanied it Lately the association had wisely put an end to the practice of block elections to the council—a system which sometimes worked unfairly and was associated with much lobbying One evil has been replaced by another Organised lobbying about issues before the representative body is something new in British medical politics This body is composed of men and women who attend, not of their own right, but as the mouthpieces of their local divisions, which have previously ranged over the principal items on the agenda Usually these representatives are free to vote against their divisions instructions—if they were not, the business might as well be conducted by card polls—but this is after a free and open interchange of views In answering the whip of any separate group or sect a representative exposes himself to the risk of prejudging an issue which should rightly be settled only in the light of local and national opinion It is, of course, for the divisions themselves to decide whether they want their representatives to be twice briefed, but this development seems strangely at variance with the freedom which some doctors profess as their aim

Diphtheria in the Inoculated

THE medical student of today must think himself fortunate if he sees a single case of clinical diphtheria during his training The incidence has fallen steadily from its pre-war level of around 60,000 per annum to 1897 (corrected figure) cases last year, and for this the national campaign of immunisation inaugurated in 1940 is largely responsible Yet those charged with the immunising of children have usually been careful not to claim that the inoculations will give complete protection against diphtheria, even though their prophylactic reagents have reached a high degree of antigenic efficiency According to estimates based on notifications, the incidence of diphtheria in uninoculated children is three to five times greater than in the inoculated, but sometimes the infection spreads through a community which has apparently been efficiently immunised. Outbreaks of this kind have been seen in boarding-schools, where the "velocity of infection ' may be considered high, but that they may also occur in larger communities is demonstrated in the detailed account of diphtheria during the war years on Tyneside and in Dundee by Sir PERCIVAL HARTLEY, Prof W J TULLOCH, and their colleagues,

1 See *Lancet* July 8 1950 p 61

at the ends of the chapters, and this is just as well since, by an odd mischance, the letter L has been omitted from both author and subject indexes The book is a very clear description of the clinical and biochemical aspects of the subject, and the literature is thoroughly discussed

Hemorrhagic Disorders

PAUL M AGGELER, assistant clinical professor of medicine, University of California, S P LUCIA, professor of medicine in the university Chicago University of Chicago Press London Cambridge University Press 1949 Pp 112 £3 15s

IN the past few years the fashion has grown up for arranging in book form the text, diagrams, and illustrations originally planned as an exhibit for showing at a conference or for teaching Such exhibits generally make unsatisfactory books, and the volume under review is no exception to the common rule The illustrations, primarily designed as "visual aids," are elementary to the point of absurdity—e g, the jolly picture of a young woman biting herself to produce "purpura factitia." The human figure, when it appears, is luridly coloured, and only extreme forms of disease seem to be illustrated Nor is the text very good Some sections are perfectly sound, for instance, the authors are not deceived by recent talk about the need for finding changes in the megakaryocytes in thrombocytopenic purpura, and there is a refreshingly frank section on the treatment of hæmorrhagic disease But on the whole we doubt whether "practising physicians, medical students, and laboratory technicians" really need this sort of strip-cartoon teaching

The Actinomycetes

Their Nature, Occurrence Activities, and Importance SELMAN A WAKSMAN, PH D, professor of microbiology, Rutgers University Waltham, Mass *Chronica Botanica* Co London W Dawson & Sons 1950 Pp 221 $5

THE actinomycetes, a heterogeneous group comprising many thousands of species, are found in soil (in which they may represent nearly a quarter of the cultivable micro organisms), in dust, fresh water, and lake bottoms, in decaying plant and animal residues, and on vegetation They play a vital part in the processes of nature but they are also agents of spoilage and destruction of perishable materials A few species belonging to the genera actinomyces and nocardia are pathogenic for man and animals, and some species of streptomyces cause disease of plants, notably potato scab

At the moment, the main interest in the actinomycetes is focused on the production of antibiotics, chiefly by species of streptomyces About 30 antibiotics have already been isolated, and though some have proved too toxic for therapeutic use, such others as streptomycin, 'Aureomycin,' and 'Chloromycetin' are very valuable, and the prospects for further discoveries are good Professor Waksman conducts his readers over the whole field of the microbiology of the actinomycetes—morphology and life-cycle, metabolism, growth, and nutrition Mutation and variation, both morphological and physiological, are exhibited to a greater extent by the actinomycetes than by any other group of micro organisms The vexed question of taxonomy and nomenclature receives much attention and the basis of classification is fully discussed keys to 15 different systems of classification are given, including that of Waksman and Henrici which has already won wide approval Of particular importance are the chapters on the production of enzymes and vitamins, the antagonistic properties of some species towards other micro-organisms, the production of antibiotics, the distribution of the species in nature, and their rôle in the decomposition of animal and vegetable residues Separate chapters are devoted to the pathogenic species affecting animals and plants, and the final chapter is a summary of the whole work An appendix gives the formulæ of 26 culture media, a bibliography of 522 titles, a general index, and an index of organisms

This work should appeal strongly not only to microbiologists and biochemists but to members of every branch of medicine and even to the lay reader

Tooth Size and Occlusion in Twins

ANDERS LUNDSTRÖM, from the State Institute of Genetics and Race Biology, Uppsala Basle S 1948 Pp 206

THIS book describes an investigation which Lundström undertook in an attempt to elucidate the aetiology of malocclusion of the teeth Among the 202 like-twin pairs investigated (100 pairs of which were diagnosed as identical), he found "considerable" occlusion more or less equally often in both types of twins, but the identical-twin pairs had both more affected rather more often than the fraternal However, as these were relatively moderate deviations from what is regarded as normal occlusion, the value of the investigation probably lies in the biometrical aspects of tooth size and spacing, and of and shape of the jaws The measurements of the characters have been carefully made, and the technique of measuring are fully and clearly described in the book. In the statistical analysis of his data, the author has followed Dahlberg's technique of partitioning the variation into that due to hereditary factors, and that due to non-hereditary factors This method of has certain limitations because it assumes that heredity and environment have independent additive effects takes no account of the fact that, *because* of their identical genetic make-up, monovular twins will respond in similar fashion to the same environment Lundström, however, draws no more rigorous conclusion from his analysis than that, on the whole, the part played by genetic factors in tooth and jaw development is as important as that of environmental factors

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Blood Clotting and Allied Problems (New York Josiah Macy, Jr, Foundation 1949 Pp 231 $2.25)—Edited by Joseph E Flynn, these conference transactions are useful not only for the original papers but also for the subsequent discussions, which are reported verbatim Conflicting views thus come into prominence and an informative note of asperity sounds quite often The most useful parts of this volume are the general discussion *on the standardisation* of thromboplastin, and a paper by Quick *on the status* of platelets The other sections are more technical So much work is now in progress on this subject that much of the material reported at this conference, held over 12 months ago, is out of date, and some of the disputants have already changed their views

Spezielle chirurgische Therapie (2nd ed Berne Huber 1949 Pp 1101 Sw fr 88)—The second edition of Max Sargesser's surgery has been extensively revised and has additions too numerous to specify It is really an excellent textbook of operative surgery It is simple and practical in its instructions and obviously is an account of surgical methods actually practised in the University of Berne It does not pretend to be comprehensive and include all operations and modifications which have been described It is up to date and can be recommended as a reliable guide to the general surgeon, and particularly to those whose experience is not great The illustrations, which are very numerous, are always explanatory

La chirurgie de la douleur (3rd ed Paris Masson 1949 Pp 47 Fr 1450)—There is so much that is debatable in the subject of pain and its causation and physiological basis that many interested investigators will welcome this new edition of Prof René Leriche's book, which first appeared fourteen years ago This author's unorthodox views on the causation of pain are based on his clinical observations extending over many years, and, though not all his deductions are acceptable to everybody, they have led him to devise methods of treatment which are often strikingly successful in alleviating pain Operations on the sympathetic for this purpose are now generally accepted but readers of this book will feel that there is still much to learn as Professor Leriche freely admits there are inexplicable failures Even so the successes in this field of surgery, neglected because unexplored, are even more impressive than the failures The book should stimulate new efforts to elucidate the different problems of pain and to search for more reliable methods for its relief Professor Leriche has an original approach to his subject, for which he has undeniably good grounds, based on observation Others might with advantage follow his line of research

e failed to prove inherited susceptibility Neither that matter has it been definitely shown that any icular environmental factor, such as poor diet, a ip house, or overcrowding, promotes susceptibility. JL WHITE, MAY WILSON, and others believe t a child is more likely to develop the disease if its ents or siblings are so affected, and for the purposes prevention such children may be regarded as entially susceptible. At the present moment, rever, the only certain criterion of susceptibility the history of a previous attack of rheumatic er or chorea There is as yet no test that can ect the rheumatic diathesis before the attack

In the control and management of hæmolytic eptococcal infection there have been great advances ing of floors and bedding has been found to decrease airborne dust that may spread the organism in titutions such as fever hospitals Adequate isola- n of infected patients has resulted in a great crease of cross infection, and much has been ned from the fundamental work of LANCEFIELD d GRIFFITHS, which showed that streptococci of many types which do not necessarily confer otection against one another But perhaps most lp of all has come from the new chemotherapeutic vances, for it is clear that chemoprophylaxis and emotherapy can both play a part in reducing the cidence of rheumatic fever With each of the two ents tried—sulphonamides and penicillin—there are o possible approaches to the problem prophylactic eatment can be given over a long period to prevent e spread of hæmolytic streptococcal infections, or emotherapy may be used in the established strepto ccal infection to prevent rheumatic fever following gain both methods can be applied either to groups susceptible subjects (such as the inmates of rheu- atic fever hospitals) or to sections of the general pulation

One of the first major contributions in this field as that of THOMAS and FRANCE,[2] who gave small nounts of sulphanilamide to rheumatic children ily during the winter months, and found that eated children had an insignificant number of lapses compared with untreated controls This ork has since been confirmed in Australia[3] and the nited States There seemed to be few complications sulphonamide prophylaxis in rheumatic children, but tempts in the United States to extend mass sulphon- nide prophylaxis to military personnel at training ntres, though promising at first, led to the appear ice of sulphonamide resistant strains of hæmolytic reptococci which made the method useless More er, drug sensitivity developed in many cases, and is sometimes serious[4] Whether sulphonamides lp to prevent rheumatism if used in the treatment streptococcal sore throat is distinctly doubtful ough they will shorten the streptococcal illness, e evidence on the whole indicates that they will t modify the type or duration of the subsequent eumatic fever[5]

Oral penicillin offers an alternative to sulphonamides in the prophylaxis of rheumatic fever, though the dose has to take account of the fact that some four-fifths of the activity of penicillin is destroyed in the gastro intestinal tract There is reason to think that the development of penicillin-resistant strains of organisms is not a serious difficulty here,[6] and that both frank streptococcal infection and the symptomless carrier state can be prevented in rheumatic children[7] Though MASSELL and his associates[8] at Boston also produced evidence that prompt penicillin treatment of streptococcal throat infections in rheumatic subjects will reduce the incidence of relapse, not everyone agrees that it does so, and cases have occurred in which the earliest possible penicillin treatment of a streptococcal throat infection has been followed by a severe rheumatic relapse If, as most authorities now believe, rheumatic fever is the result of hypersensitivity of the connective tissues to something produced when the hæmolytic streptococcus infects the throat, the strength of the rheumatic reaction may bear no relation to the degree or dura tion of the streptococcal infection which initiates it—just as an explosion of gunpowder bears no relation to the size of the flame that lights the fuse Hence in the treatment of a throat infection in a rheumatic person one would not necessarily expect penicillin to be valuable A well designed study by DENNY et al[9] suggests, nevertheless, that it can prevent rheumatism from following streptococcal infection in people who have not previously manifested sensitivity Treating upper respiratory infections in United States servicemen they gave crystalline procaine penicillin in oil with aluminium stearate, and gave it at the earliest possible moment—i e, before the presence of the hæmolytic streptococcus was confirmed in the laboratory Of 798 patients treated in this way, 2 developed rheumatic fever, compared with 17 of 804 controls who did not have penicillin This finding obviously deserves close attention, but it should be borne in mind that the American workers may be dealing with acute rheumatic fever in a form rather different from the disease as we know it, since an incidence of rheumatic fever in 2% of untreated hæmolytic streptococcal throat infections is higher than would be expected among young men in this country

In summary, therefore, it may be said that penicillin offers the possibility of preventing rheumatic fever There are four ways of using it Firstly, it may be given daily in prophylactic doses to rheumatic subjects to prevent streptococcal infection Secondly, it may be given similarly to normal people living in groups where they are exposed to such infection[10] Thirdly, it may be given to rheumatic subjects as soon as they develop a throat infection Fourthly, it may be given as a routine for all throat infections possibly attributable to a streptococcus Of these four methods the first may be regarded as established and the last as promising, while the others are "not proven" and probably ineffective

Thomas C B France R *Bull Johns Hopk Hosp* 1939 64 67

Rubbo S D Holmes M.C Stokes H L *Lancet* 1949 ii 311

Epidemiology Unit 22 *J Amer med Ass* 1945 128 921 Damrosch O S *Ibid* 1946 130, 124

Spink, W W Ranz D A. Boisvert P J Coggeshall H *Arch intern Med* 1946 77 266

6 Krumwiede E *Pediatrics* 1949 4 634

7 Pitt Evans J A *Proc R Soc Med* 1950 43 206 Hofer J W *J Pediatr* 1949 35 135

8 Massell B F Dow J W., Duckett Jones T *J Amer med Ass* 1948 138 1030

9 Denny, F W Wannamaker L W Brink, W R Rammelkamp C H jun., Custer E A *Ibid* 1950 145 151

10 Kuh C Collen M. F *Ibid* 1943 140 1324

in a report[1] to the Medical Research Council The studies in the two areas were conducted independently, and though they cover much common ground they are also complementary In both areas, infection with the gravis type of *C diphtheriæ* had recently become prevalent and had led to an increased incidence of severe diphtheria which in Dundee was as frequent in the inoculated as in the uninoculated and showed also a higher attack rate than usual in the older age groups In a preliminary study on Tyneside, examination of the blood serum from inoculated patients with diphtheria indicated that high levels of antitoxin might be found at the early stages of infection, and this paradoxical finding, only partially explained by faulty techniques in blood collection, led on to more exhaustive inquiries

The assessment of antitoxic immunity was based on very careful estimations of the antitoxin values in the blood, and not on the Schick test which is more useful for measuring the over-all response to immunisation in a community than individual resistance to infection Schick negative reactions have often been found in people with antitoxin levels from 0 01 down to 0 004 unit per ml and positive reactions in those with titres higher than the 0 03 unit at which SCHICK put the dividing line between resistance and susceptibility Nowadays, a negative Schick reaction indicates an antitoxin level somewhere between 0 02 and 0 005 unit per ml, and it might be argued that this level is too low if the Schick test is to be used as an indicator of community resistance to diphtheria It is obvious from the Tyneside and Dundee findings that an epidemic strain of *C diphtheriæ*—and this usually means a gravis strain—can overcome some degree of antitoxic immunity What is less certain is whether a high antitoxic immunity, say of 0 5 unit or more per ml, will protect against clinical infection It is true that 10–15% of the cases of clinical diphtheria among the inoculated in these two areas were found to have at least 0 5 unit per ml on their admission to hospital, but it is possible that these high levels resulted from the stimulus of the infection, which may have been present for some days before the clinical symptoms appeared For example, in one small group of patients who were not given antiserum, the antitoxin content of the blood increased from 0 002–0 01 unit per ml on the second or third day of disease to 30–50 units per ml on the seventh to tenth day Another significant finding was the different levels of antitoxin in three comparable groups of inoculated children in Dundee —children with diphtheria, children with other infections, and healthy children About half of the first group had antitoxin titres of 0 004 unit or less per ml, compared with a tenth of the children in the other two groups, and at the other end of the scale only a tenth of the inoculated children with diphtheria but half of the other two groups had levels above 0 1 unit per ml These figures indicate that during an epidemic children with low levels of antitoxin will be more susceptible to attack than those with higher levels Nevertheless, it is not impossible for diphtheritic infection to occur in children with a high antitoxic immunity Diphtheria in the inoculated is almost always due to gravis or intermedius which are believed to have a much greater capacity than the mitis strain It seems that such invasive strains could initiate a infection even though the toxin they produced quickly neutralised, just as a toxigenic strain *Strep pyogenes* may cause tonsillitis without a in people whose blood contains an effective level streptococcal antitoxin The striking difference diphtheria in the inoculated and in the uninoc lies in the severity of the infection, and this differe is to some extent correlated with the amount of culating antitoxin In the two areas studied, there were no deaths among the inoculated patients, though about a fifth of them had no circulating antitoxin on admission to hospital, which suggests that people with a basal immunity can mobilise antitoxin quickly enough to protect susceptible tissues from severe damage The lesion often takes the form of a follicular tonsillitis without the typical adherent and confluent membrane and complications such as adenitis, myocarditis, and postdiphtheritic paralysis are much less common in the uninoculated

In the campaign against diphtheria, our aim should be to eliminate clinical infection completely This may be achieved by immunising 75% or more of the child population, which will reduce the total incidence of clinical infection and consequently the carrier rate and by maintaining the antitoxic immunity at as high a level as possible to protect the community against the more invasive strains It is perhaps no coincidence that many of the severe outbreaks of diphtheria in the past twenty or thirty years have started in our ports—Bristol, Cork, Hull, Tyneside, and Dundee—and it may be that virulent variants of *C diphtheriæ* are introduced from time to time from abroad, for the prevalent strain in the Dundee and Tyneside outbreaks differed in some respects from the recognised indigenous gravis strains The present diphtheria prophylactics, such as A.P.T and P.T.A.P, give a Schick conversion rate approaching 100%, but we need more information on how to maintain a high level of antitoxic immunity over a long period Meanwhile it seems wise to recommend primary immunisation in the first year of life, with further stimulating doses when the child enters and leaves school

Prevention of Rheumatic Fever

RHEUMATIC fever is now generally regarded as a consequence of infection of the throat of a susceptible person by hæmolytic streptococci of a Lancefield group On this assumption we can try to prevent it in two ways (1) by controlling hæmolytic streptococcal infections, and (2) by detecting and protecting susceptible individuals

Just what determines susceptibility is not yet known Though many reports have shown that acute rheumatism tends to be familial, one has to remember that the children of a family usually have a common environment as well as a common inheritance, in particular they may share in exposure to hæmolytic streptococcal infection Extensive investigations, such as those conducted by the Medical Research Council in 1937,

1 A Study of Diphtheria in Two Areas of Great Britain *Spec Rep Ser med Res Coun, Lond* no 272 H M Stationery Office 1950 Pp 162 4s

1 *Spec Rep Ser med Res Coun Lond* no 114 1927

racters among all human groups" In fact, given ilar chances to develop their mental capacity, the rage achievement of each ethnic group turns out to about the same And all groups have the one trait ich has been at a premium in man's evolution—the of learning by experience, adapting themselves to essity It is good to know that doctors have these this so much in mind that the British Medical Associa- a has earnestly debated whether to forgo holding an nual meeting in a country with a colour bar, and that ith African doctors have undertaken to do their nost to prevent humiliation of coloured members the association on that occasion That such an under- ing should be necessary, and that it cannot be given the form of an assurance that no such humiliation ll be attempted, is a grievous thing

Unfortunately most people use the word "race" more selv than the anthropologists They apply it to tional, religious, geographic, linguistic or cultural oups, and to each of these attribute fundamental ferences of mind and nature In fact, such groups not necessarily coincide with racial groups at all, d their cultural traits "have no demonstrated genetic nnection with racial traits" The authors of *We uropeans*[1] gave us the anthropological background r this conclusion they showed from what a mongrel ock the caucasoid group has descended The Jews, rticularly, who have perhaps suffered more in the ime of "race" than any other cultural group, prove be as various in origin as the English Peoples differ ot in their nature or ability, but only in their social istoms and history "In *our* house we do it like this," ys the child, and feels himself superior Nations it ems, are much the same, and with as little cause for auteur Confucius, some 2500 years ago, summed it up Men's natures are alike, it is their habits that carry iem far apart"

PROTECTION FOR LABORATORY ANIMALS

OUR Cruelty to Animals Act of 1876 ensures that imals used for scientific experiment in Great Britain re better protected than in any other country In ose days, admittedly, legislators were chiefly thinking terms of surgical operations and were concerned to rotect animals from the pain these might cause, hereas nowadays animals are used for many purposes, ost of which cause no pain though they may entail iscomfort But it is doubtful how much would in ractice be gained by re writing an Act whose success epends so largely on good feeling On the other hand, nodel legislation should at least be useful to humane eople in other parts of the world where a programme of eform is badly needed The Universities' Federation or Animal Welfare (UFAW) has therefore put forward a nodel Bill drafted by Major C W Hume, the secretary, hich follows the existing law in many ways, but goes urther in a number of directions Like the Act it requires hat those who experiment on animals should be licensed, nd should work in a place registered for the purpose nd subject to inspection, that operations should be lone with the animal anæsthetised, and that no experi nent should be done on an animal which occasions ubstantial suffering of more than moderate duration, evere suffering of more than short duration, or extreme uffering, and that if an animal is found to be likely o suffer a degree more severe than any of these, it should e painlessly killed or fully anæsthetised, whether or not he object of the experiment has been attained The Bill goes further, however, in covering not only laboratory nimals, but animals used for the manufacture of sera nd vaccines and the like and it also protects unpopular species—like rats—equally with popular species, like dogs, cats, and horses The categories of pain outlined above are to be defined according to analogy and pre cedent, and examples are offered as a guide. Anæsthesia, too, is defined afresh, with particular attention to the degree of anæsthesia to be expected from electrical shock procedures It is as well that this subject should be aired, for electric shock may leave an animal paralysed and apparently unconscious when it can in fact feel pain normally Electrical shock methods are now used to kill animals in some slaughter houses, and there is evidence, as Major Hume has shown elsewhere, that they may even appear dead, when they are in fact conscious and suffering

The Bill also proposes that the law should be adminis tered by a Board of Control, appointed for the purpose from among humane scientists and veterinarians This board would grant licences, appoint inspectors, and exercise discipline Licences would be carefully graded according to the degree of suffering likely to be caused by the experiment, and would be issued only to scientists known to be technically competent and of humane temperament A subordinate grade of licences would be issued to laboratory technicians, permitting them to carry out prescribed procedures under the experimenter to whom they were attached

The draft of the Bill is now being circulated, and constructive criticism and comments will be welcome Copies may be had from UFAW, 284, Regent's Park Road, Finchley, London, N 3

PHARMACY OF P A S

THE increasing use of sodium *p* aminosalicylate (sodium P A S), alone or with streptomycin and other drugs, in the treatment of tuberculosis has raised some problems for prescribers and dispensers *p* Amino salicylic acid (P A S) proved too insoluble and unstable for convenience The sodium salt, however, is readily soluble in water, and its aqueous solutions are reason ably stable, though they darken on storage, but for patients being treated at home it is probably wise not to order more than a week's supply at a time Since 100 g of sodium P A S is equivalent to 72 5 g of P A S prescriptions should indicate clearly which drug is being ordered Sodium P A S at first tastes bitter and then intensely sweet, but Pugh and Jones, in their paper of July 15, noted that patients preferred taking it in a mixture, with syrup of orange and emulsion of chloro form as flavouring to swallowing a large number of tablets daily It may also be prescribed in packets, each containing one dose, which the patient empties into a glass of water as required

THE CONGRESS OF OPHTHALMOLOGY

THE sixteenth International Congress of Ophthal- mology opened in London last Monday with an attendance of more than 1000 members from 64 countries The Duke of Gloucester, who read a message of welcome from the King and Queen, presented the Gonin medal to Dr H Arruga The congress has not met in London since 1872, and its president is Sir Stewart Duke Elder

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THE sixth International Congress of Radiology will be held in London next week

ON July 13 Sir CECIL WAKELEY was re elected president of the Royal College of Surgeons of England The vice presidents for the year are Prof ERNEST FINCH (re-elected) and Mr P H MITCHINER

Dr CHARLES HILL is resigning the secretaryship of the British Medical Association which he has held since March, 1944 At the last General Election he was returned as National Liberal and Conservative M P for Luton

Huxley, Julian Haddon A. C Carr-Saunders A M Pelican Books 1939 1s 6d

Annotations

BACK TO BASIC SCIENCE IN CANCER RESEARCH

A TREND that was conspicuous in last year's annual report of the British Empire Cancer Campaign has become still more evident in the work described for 1949 [1] This has been towards the investigation of the properties of our experimental materials, whether cell constituents, carcinogenic chemicals, or physical agents, in terms familiar in the basic sciences The pursuit of this trend must add to the difficulty of explaining the ways of the laboratory worker to the physician and surgeon, yet it is fully justified by the present state of cancer research and all experience of scientific endeavour

The report provides plenty of examples of this type of investigation, the best illustration perhaps being the inquiries into the basic properties of nucleoproteins These proteins have a twofold relevance to cancer—first, on account of their preponderance in nuclei and in intracellular synthesis, and second, because some of the nearest demonstrable continuing causes of a few special tumours, the virus tumours, are themselves particles of nucleoproteins Much valuable work has been done, at the Chester Beattie Research Institute and elsewhere, on the chemical and physical properties of nucleic acids and nucleoproteins, including their interactions, either as isolated entities or within the cell, with various carcinogenic and related chemical and physical agents From this institute also it has emerged that some of the carcinogenic aromatic nitrogen mustards induce numerical and structural alterations in chromosomes And these alterations are self perpetuating, though they are not necessarily an essential part of the malignant change Other contributions to these studies come from the University of Durham, on the effects of radiation on nucleic acids (also on amino acids and sterols), and from Birmingham, where the investigations into fundamental chemistry and some of its practical applications have been continued Attempts are being made to unravel the mechanisms of the two main reactions—the Dische and Feulgen tests—for the detection of ribonucleic acids in tissues The synthesis of nucleoproteins is being studied with great ingenuity in the Department of Radiotherapeutics at Cambridge by the use of radioactive isotopes and X radiation Apparently, it is now possible to detect interference in the synthesis of each of the two proteins separately when it is interfered with by X radiation The extensive knowledge gained in this way and from the study of chemical enzyme poisons has led to a promising therapeutic procedure in this department X radiation which can be localised is used in combination with enzyme inhibiting chemical agents which act at a different stage in synthesis, so that the malignant cell is dealt a double blow The survival times of patients treated with some of these combinations have encouraged further work on the same lines Other centres engaged in nucleoprotein research are the Royal Institution (London) and Nottingham University

Since the discovery of initiating and promoting factors in tumour induction—the first by a specific carcinogen, the second by a limited variety of "irritants"—more attention has been paid to the possibility that two or more factors may be operating in spontaneous carcinogenesis At the University of Glasgow an enterprising attempt has been made to probe the causes of the high incidence of liver cancer among Asiatics and in the coloured races of Africa It was thought that the cause might be in a combination of dietary deficiencies, which damage the liver and are common in Africa and the East, and a popular herbal remedy supplying the specific carcinogenic factor The herbal remedy suspected derived from *Senecio jacobæa*, which is known to liver damage in cattle In experiments with this stance no tumours were obtained, but the idea valuable one Working on similar lines, C Hoch at the London Hospital was more successful. L damage was produced in rats by feeding them inadequate diet containing a combination of am in ardein (a protein derived from the ground Then 21 rats had chillies (cayenne peppers) added this defective diet, and after seven months 12 of had developed neoplastic changes in their livers wh after twelve months no tumours had appeared in co rats on the same diet without chillies The final outc of these experiments should be instructive, and it be interesting to hear what is found to be the respon agent in the chillies

The report mentions much other valuable work chemicians, pathologists, and physicists that must rem unnoticed here The volume should be studied in det by all who are working in any field of cancer research

[1] Twenty-seventh Annual Report of the British Empire Cancer Campaign for 1949 Edited by Sir Henegage Ogilvie From 11 Grosvenor Crescent Hyde Park Corner London S W 1

HOMO SAPIENS

> " biological studies lend support to the ethic universal brotherhood, for man is born with dri toward coöperation, and unless these drives are satisfi men and nations alike fall ill In this sense, every m is his brother's keeper For every man is a piece of th continent, a part of the main "

In this way a group of scientists drawn from varion countries, with Prof Ashley Montagu, of the United States, as rapporteur, sum up their findings on race problems In a statement published on July 18 by the United Nations Educational, Scientific, and Cultural Organisation, they point out that all men belong to the species *Homo sapiens*, and that they most probably derive from a common stock The *drift and random* fixation of the genes, the changes in *their structure*, and such factors as isolation, hybridisation, and natural selection are responsible for the differences between groups, as we see them, but the genes carrying such differences are few compared with the vast number which carry the likenesses When set against the whole genetic constitution of man they are trifling, and show the hereditary differences between peoples to be no more than variations on a theme From the biological standpoint, then, "a race" can be defined as one of the group of populations constituting the species These populations are all capable of interbreeding, but geographical and other barriers which kept them apart in the past has produced in them some differences in physical characters which in the course of time may appear, fluctuate, or disappear Races—or ethnic groups—are therefore few, the anthropologists are content to classify mankind into three main divisions—mongoloid, negroid, and caucasoid (which looks uncommonly like the yellow, black, and white of the nursery) Even these broad divisions fluctuate they are not the same now as they were in the past, and there is every reason to think they will change in the future No biologic harm comes of intermarriage between them, statements that the children of such mixed matings show undesirable traits, such as "physical disharmony and mental degeneracies," are not supported by the facts Race mixture of this kind has been going on from the beginning of man's time, and one of the chief processes of race formation and race absorption is through the crossing of ethnic groups "The social results of race mixture whether for good or ill can be traced to social factors"

Nor is there any evidence that mental characteristics are among the items which differentiate ethnic groups When allowance is made for differences of environment intelligence tests show "an essential similarity in men's

the approach of Harvey and his work, and that the tude which Harvey adopted towards the facts, more iaps than the actual physical discovery, was his real ievement Sir Henry added "So clear are his ervations and so cogent his reasoning that I would st that every medical student had *De Motu Cordis* ı set book for his preclinical study" I think that that ill the more necessary today, when we are a little apt to neglect the history of medicine, which is the cess of thought, and to confine ourselves to the achieve- at of medicine, which is the accumulation of knowledge

he counter attitude, the sudden reappearance of honty as a criterion, a touchstone, is very difficult us fully to appreciate The best example of it, or ı of the more striking examples, is in the presidential lress by the President of the U S S R Academy of ences, S I Vavilov, on the occasion of the 70th thday of Stalin He says there, "Soviet science is rty science"—this is the head of the Academy of ences speaking—' it corresponds to the ideology of ı vanguard of the advanced class the working class, ich is leading mankind to a better future"

"This Party character of our science determines in many ases its programme its most important channels of levelopment The feature which sharply distinguishes our science in general is its clearly expressed materialistic foundation and practical direction The struggle against idealistic tendencies in science which divert it from the correct course is characteristic of all fields of Soviet science Unlike the situation in science in capitalist countries where idealistic tendencies have become particularly pronounced precisely in the last few years, Soviet science constitutes an impregnable materialist monolithic unity"

ıd he concludes "The days of so called pure science e gone forever in the Soviet country"

These are very uncompromising statements, and they e remforced by a number of examples, some of which e very extreme In the same address S I Vavilov ıd "The remarkable feature of the scientific theories Lenin and Stalin is their infallibility"—an interesting ıppearance of that word "One of the fundamental asons of this infallibility lies in the impregnability of e foundation upon which Lenin-Stalin science is built his foundation is dialectical materialism" Infalli- lity! Well, it is easy to see that a very great stride is progress, away from the conception which we had ıought previously to be almost axiomatic

As I have said, this new attitude has been brought out nefly in the field of biology In a way this is a great ity Michurin's and Lysenko's contentions are well orth examination, as indeed any heretical doctrine is ell worth examination, for it is from the examination f heresy that true doctrine proceeds The contention ıat Michurinism is scientifically untrue and Mendelism ientifically true is not the last word. That a good deal f further examination is necessary has been demon- rated by a great many keen and critical intellects in ır own world The keenest perhaps, and the most ıtical, is that of Bernard Shaw whose views against ıe whole argument of Weismannism are extremely ıteresting In his recent review of *The Essential Samuel Butler*[2] he held up Samuel Butler, another not incon- derable intellect, to great praise because of his fierce enial of what he calls the Darwinian doctrine He said We picked up this stick, the doctrine of Natural election of Darwin and Wallace, which was carried to bsurdity by Weismann We all, Butler included, rabbed it and layed on joyously Butler alone thought out deeply and quickly enough to grasp the horror of s banishment of mind from the universe"—which is a ery interesting line I note that neither Michurin nor ysenko advocate their views as the establishment of ınd in the universe, but rather as the establishment of materialism, but by this time materialism has become in this context so conventional, so ritual a word that one takes it as one takes a coin abroad, hoping that it is of genuine mint, in circulation in the country concerned, but not necessarily current in other countries

The stress which has been laid on the doctrine of Michurin, and afterwards of Lysenko, the denial of the whole machinery of genetics, the denial that the chromo somes have any place whatever in the inheritance of characteristics, the assertion of an absolute belief in the transmission of acquired characteristics—all these lead to the question whether this attitude is confined to the one field of science or whether it is part of a general denial of western scientific methods in all fields of science The best comment so far, I think, has been given by Professor Eric Ashby, who is Harrison professor of botany in the University of Manchester He brings down the question rather to the shortage of food in Soviet Russia and the necessity for any line which will lead to a short term advance in the productivity of the soil there[3] He says

> The Achilles' heel of Soviet Russia is her food supply therefore it is evident that the prestige of Lysenko must be preserved, whatever the cost Unfortunately, owing to the bitter clash between Lysenko and the scientists over the aims and criteria of agricultural research, the cost has been very high
>
> 'When the issue was fought in 1948 official support had to be given to Lysenko, but I do not think that any reputable Soviet scientist would regard this as more than a temporary expedient as more than a consequence of the anti-cosmopolitan policy of the Soviet Government and of the urgent need to improve agriculture'

"One distinguished Soviet scientist" Professor Ashby says "put it very well when he said at the discussion following Lysenko's paper that it is important '*at this juncture* to cherish the prestige' of Lysenko"

Now, the question is, does this explanation cover the facts? There are certain facts which it does not cover I give all weight to Ashby's views, I met him in the Soviet Union, he has himself lived there, he was director of the Scientific Liaison Bureau in 1942–43 and was the Counsellor of Australia in Moscow in 1945–46 His views in some ways are more objective even than the views of Julian Huxley, who gives evidence with a vehemence which in some ways is more theological than scientific Ashby in his paper in the *British Medical Journal*, casts rather vigorous criticism on popular books on this subject, as for instance, *Russia Puts the Clock Back*, by J Langdon Davies He says 'Mr Langdon-Davies (unlike most geneticists) seems to regard Mendelism as sacrosanct, so that he feels obliged to defend it with the zeal of a medieval churchman defending orthodoxy" (You notice how religious terms begin to creep into the whole examination of this problem) Ashby says "when he discusses biology Dr Huxley is authoritative and scrupulously accurate, and when he discusses Russia he is much more modest and tentative than Mr Langdon Davies." Ashby says that the motive behind it all is still elusive "No obvious interpretation arises from the facts as Dr Huxley presents them" The Russians are very intelligent, says Ashby among them are scientists as gifted as any in the western world. "Why, then," he asks 'has the Russian Government attacked the very intellectual liberties which make scientific research possible? Why has it agreed to give public support to a fanatic whose scientific attainments would not qualify him for a junior post in a British University?" There he repeats the same argument which he uses in his reference to the Achilles' heel.'

Russia s food supply is in the hands of a very simple, ignorant and lazy peasantry When Lysenko comes among this peasantry with the zeal of a prophet and with such

2 *Observer* March 20 1950

3 *Brit med J* 1950 1 241 *Listener* March 10 1950

Special Articles

THE TWO CONCEPTIONS OF SCIENCE*

WALTER ELLIOT
P C, M C, M B, D Sc Glasg, F R C.P, F R S, M.P

THE two conceptions of science are the absolute and the functional. The absolute considers science an end in itself, which does not admit question or justification, or, if there be any justification, the justification is simply the nature of man The functional conception of science is that it is a handmaid to government, among many such, in which are included law, order, and armed force

This clash is fundamental, and it is vital to our times Its open emergence is healthy, as the emergence of any real clash is healthy—healthier, at least, than its suppression But it is as well to remember that here is the shattering of the second great House of Faith which the Western world has built for itself, and, since mankind does not exist without some kind of shelter, the destruction of this House will be followed by the erection of another, which we cannot as yet discern

Western civilisation's other name is Christendom It had for its first shelter the House of Faith called Religion It was a House of Faith so universally accepted that eventually to question it was reckoned as mortal sin—indeed almost as something pathological Its authority was successively shaken by the Reformation, by the Encyclopædists, and finally by the failure to reconcile itself with the discoveries of science Christendom, and the tenets of Christendom, are no longer the universally accepted conception of the Western world This conception was gradually replaced by the conception of Progress or Perfectibility, which was a conception of the 18th century but persisted into the 19th, and was exemplified in such things as the simple belief stated by Victor Hugo that a single generation of universal education would completely transform mankind Side by side with this went the conception of Knowledge, or, to use its ritual name, Science It was thought that Nature was fundamentally good, fundamentally beneficent, and that the march of science, as it was called, would of itself bring not merely material but also moral advantages to those who joined in it Even when doubts began to arise about the inevitability of Progress, the belief in Science, as a good to be pursued for its own sake, remained unchanging This belief has now been sharply challenged by the Eastern world, or, to give it a geographical habitation, by the Soviet Union The conception of science as an abstract ideal has been altogether denied

The interesting fact is that this denial has evoked almost the same response as did the challenge to the other House of Faith, to the House of Religion, some hundreds of years ago It is regarded almost as blasphemy

One example with which we are all most familiar here is what is called the Lysenko controversy But the same dispute has arisen in many other fields Alexander Werth has described the same dispute as arising in the world of music The conception of music as an art has been sharply denied and its position as a handmaid to government has been not only asserted but enforced The existence of this conception in politics and in law is, of course, an older story

The Lysenko controversy deserves attention because it is a working model, so to speak, of the whole clash Furthermore, it has been set out in vigorous language by one very well qualified to speak, Dr Julian Huxley He says

"It speedily became clear that the major issue at stake was not the truth or falsity of Lysenko's claims but the overriding of science by ideological and political authority The Communist Party has officially pronounced Michurinism is scientifically true and Mendelism scientifically untrue" [Michurinism is the science of genetics enunciated by Michurin] "It has divided science into Soviet science which is good and right, and bourgeois science which must be confuted by all Soviet scientists Such a course of action in my view and that of the overwhelming majority of scientists is impermissible To do this is to destroy the necessary autonomy and unity of science as a major human action This repudiation of the validity of science and scientific method is a denial of the freedom of the intellect which we fondly imagined has been laboriously won during the past three or four centuries"

FOUR BASES FOR BELIEF

Our Western attitude has been expressed a hundred times but never better, perhaps, than by Sir Henry Cohen in his recent Harveian lecture on the Scientific Method He is reported[1] as saying that

"There were four methods on which belief or doctrine might be based—namely, the methods of tenacity, of authority, of intuition, and of science or reflective inquiry Tenacity, obstinacy, perseverance—call it what one pleased—was the basis of many medical doctrines commonly held to be true A glance at medical textbooks made it plain that habit or inertia made it 'easier to continue to believe a proposition simply because we have always believed it'"

We are all acquainted with that in practice If an error does creep into a textbook, it has a singular way of reproducing itself in a number of other textbooks, and beliefs commonly held are maintained without any inquiry into whether the facts warrant it I recently saw an instance of that myself

I visited again, after a period of some years, the West Coast of Africa, the so called White Man's Grave Until quite recently it was considered to be inviting serious injury, if not death, to appear during daylight hours without a sun helmet This was pushed so far that penalties were imposed on those who removed their sun helmets even for a very short time, and I believe the story is perfectly true, of a clergyman who was conducting a funeral service and, when one of the company at the graveside removed his helmet while the coffin was being lowered, said sharply "Put that on again We don't want another one"

This practice has now entirely disappeared, indeed it is regarded, to use a vulgar phrase, as "cissy" to wear any hat at all Though Africans go about covered, Europeans go about uncovered, and no ill effects seem to result

It is therefore obvious that this belief, persisted in for so many years, so many decades, and so rigorously enforced, had no scientific foundation It persisted, I think, until the appearance in large numbers, of the Royal Air Force who were not accustomed to take many things on trust, and insisted on going about without hats until they could find evidence to the contrary

Sir Henry Cohen said that the second great method of belief was that of authority This, I think, is the aspect which more particularly we have to examine as the one with which we are dealing in the Eastern world, because the third one, that of intuition, has not, I think, received any great support anywhere, since the collapse of Herr Hitler's vigorous experiment which was based largely upon this method The fourth one is the method of science or reflective inquiry with which we are all very familiar

AUTHORITY

As Sir Henry Cohen pointed out, the second form, the appeal to authority, was one which persisted in the Western world over a very long period of time He was delivering this address on Harvey, and he said that "the purpose of discussion in Harvey's time was not to discover new facts but, in medicine, to demonstrate the truth of Galenic teaching" He pointed out how simple

* Presidential address to the Royal Institute of Public Health and Hygiene, delivered in London on June 29, 1950

1 *Brit med J* 1950, i, 781

s the approach of Harvey and his work, and that the itude which Harvey adopted towards the facts, more haps than the actual physical discovery, was his real uevement Sir Henry added "So clear are his ervations and so cogent his reasoning that I would ist that every medical student had *De Motu Cordis* a set book for his preclinical study" I think that that all the more necessary today, when we are a little apt to neglect the history of medicine, which is the cess of thought, and to confine ourselves to the achieve nt of medicine, which is the accumulation of knowledge

The counter attitude, the sudden reappearance of thority as a criterion, a touchstone, is very difficult us fully to appreciate The best example of it, or e of the more striking examples, is in the presidential dress by the President of the U S S R Academy of iences, S I Vavilov, on the occasion of the 70th rthday of Stalin He says there, "Soviet science is arty science"—this is the head of the Academy of iences speaking—"it corresponds to the ideology of e vanguard of the advanced class, the working class, hich is leading mankind to a better future"

"This Party character of our science determines in many cases its programme, its most important channels of development The feature which sharply distinguishes our science in general is its clearly expressed materialistic foundation and practical direction The struggle against idealistic tendencies in science which divert it from the correct course is characteristic of all fields of Soviet science Unlike the situation in science in capitalist countries where idealistic tendencies have become particularly pronounced precisely in the last few years, Soviet science constitutes an impregnable materialist monolithic unity"

And he concludes "The days of so called pure science are gone forever in the Soviet country"

These are very uncompromising statements, and they are reinforced by a number of examples, some of which are very extreme In the same address S I Vavilov said "The remarkable feature of the scientific theories of Lenin and Stalin is their infallibility"—an interesting reappearance of that word "One of the fundamental reasons of this infallibility lies in the impregnability of the foundation upon which Lenin Stalin science is built This foundation is dialectical materialism" Infallibility! Well, it is easy to see that a very great stride is in progress, away from the conception which we had thought previously to be almost axiomatic

As I have said, this new attitude has been brought out chiefly in the field of biology In a way, this is a great pity Michurin's and Lysenko's contentions are well worth examination, as indeed any heretical doctrine is well worth examination, for it is from the examination of heresy that true doctrine proceeds The contention that Michurinism is scientifically untrue and Mendelism scientifically true is not the last word That a good deal of further examination is necessary has been demonstrated by a great many keen and critical intellects in our own world The keenest perhaps, and the most critical, is that of Bernard Shaw, whose views against the whole argument of Weismannism are extremely interesting In his recent review of *The Essential Samuel Butler*[2] he held up Samuel Butler, another not inconsiderable intellect, to great praise because of his fierce denial of what he calls the Darwinian doctrine He said "We picked up this stick, the doctrine of Natural Selection of Darwin and Wallace, which was carried to absurdity by Weismann We all, Butler included, grabbed it and laved on joyously Butler alone thought out deeply and quickly enough to grasp the horror of its banishment of mind from the universe"—which is a very interesting line I note that neither Michurin nor Lysenko advocate their views as the establishment of mind in the universe, but rather as the establishment of materialism, but by this time materialism has become in this context so conventional, so ritual a word, that one takes it as one takes a coin abroad, hoping that it is of genuine mint, in circulation in the country concerned, but not necessarily current in other countries

The stress which has been laid on the doctrine of Michurin, and afterwards of Lysenko, the denial of the whole machinery of genetics, the denial that the chromosomes have any place whatever in the inheritance of characteristics, the assertion of an absolute belief in the transmission of acquired characteristics—all these lead to the question whether this attitude is confined to the one field of science or whether it is part of a general denial of western scientific methods in all fields of science The best comment so far, I think, has been given by Professor Eric Ashby, who is Harrison professor of botany in the University of Manchester He brings down the question rather to the shortage of food in Soviet Russia and the necessity for any line which will lead to a short term advance in the productivity of the soil there[3] He says

"The Achilles' heel of Soviet Russia is her food supply, therefore it is evident that the prestige of Lysenko must be preserved, whatever the cost Unfortunately, owing to the bitter clash between Lysenko and the scientists over the aims and criteria of agricultural research, the cost has been very high'

"When the issue was fought in 1948 official support had to be given to Lysenko, but I do not think that any reputable Soviet scientist would regard this as more than a temporary expedient, as more than a consequence of the anti cosmopolitan policy of the Soviet Government and of the urgent need to improve agriculture'

"One distinguished Soviet scientist," Professor Ashby says, "put it very well when he said, at the discussion following Lysenko's paper, that it is important '*at this juncture* to cherish the prestige' of Lysenko"

Now, the question is, does this explanation cover the facts? There are certain facts which it does not cover I give all weight to Ashby's views, I met him in the Soviet Union, he has himself lived there, he was director of the Scientific Liaison Bureau in 1942–43 and was the Counsellor of Australia in Moscow in 1945–46 His views in some ways are more objective even than the views of Julian Huxley, who gives evidence with a vehemence which in some ways is more theological than scientific Ashby, in his paper in the *British Medical Journal*, casts rather vigorous criticism on popular books on this subject, as, for instance, *Russia Puts the Clock Back*, by J Langdon-Davies He says "Mr Langdon Davies (unlike most geneticists) seems to regard Mendelism as sacrosanct, so that he feels obliged to defend it with the zeal of a medieval churchman defending orthodoxy" (You notice how religious terms begin to creep into the whole examination of this problem) Ashby says "when he discusses biology Dr Huxley is authoritative and scrupulously accurate, and when he discusses Russia he is much more modest and tentative than Mr Langdon Davies" Ashby says that the motive behind it all is still elusive "No obvious interpretation arises from the facts as Dr Huxley presents them" The Russians are very intelligent, says Ashby, among them are scientists as gifted as any in the western world "Why, then," he asks, "has the Russian Government attacked the very intellectual liberties which make scientific research possible? Why has it agreed to give public support to a fanatic whose scientific attainments would not qualify him for a junior post in a British University?" There he repeats the same argument which he uses in his reference to the 'Achilles' heel"

Russia s food supply 'is in the hands of a very simple, ignorant and lazy peasantry When Lysenko comes among this peasantry with the zeal of a prophet, and with such

2 *Observer* March 20 1950

3 *Brit med J* 1950 1 241 *Listener* March 10 1950

maxims as 'Keep down the weeds,' 'Space your millet more widely on dry soils,' 'Do not sow till soil temperatures are higher,' he does accomplish what in Russia are miracles—he brings production up to something like the level of that in western countries"

It is worth remembering, however, that these adulations of authority which I quoted earlier on are not confined to the sphere of biology alone I have quoted already examples of the language used in biology I quote one more Here is an opinion on the work of Professor Glushchenko, doctor of biological sciences The *Soviet News* says

"The work of Professor Glushchenko has not only practical but also great theoretical importance Basing himself on Michurin's teachings and Academician Lysenko's theoretical principles on the development of plants by stages, the author by concrete facts exposes the bourgeois Weismannites who deny the inheritance of acquired characteristics"

Now, you may say "Well, that only strengthens the point that this is attached to the development of food supplies and not to other aspects" But in astronomy, which is a long way removed from any immediate connection with food production, the Physico Mathematical Section of the U S S R Academy of Sciences held a session at which reports were given on the latest research in astrophysics The *Soviet News* states that "Soviet scientists have upset the theory of bourgeois, and especially American and Swedish, astronomers that the counter radiance observed"—that is, in the "tail of the earth" outside the atmosphere—"is caused by an accumulation of meteorite-particles" It would seem therefore that the opposition to "bourgeois" scientists extends to certain phenomena in astrophysics

I think one must take it that the extension of this unquestioning belief in the infallibility of authority is a feature common to all sections of Soviet science † Here are greetings from the Central Committee of the Communist Party of the Soviet Union to Mr Stalin when he was awarded the Order of Lenin

"You have invested with your wisdom, indomitable energy and iron will each change, great and small, which raises our Motherland higher and higher Great army leader and organiser of victory, you, Comrade Stalin, created the advanced Soviet military science In the post-war conditions, guided by your directives, the entire Soviet people concentrated their creative initiative on the earliest liquidation of the aftermath of the war, on the realisation of the great plans for the further development of the national economy and culture of the country of Socialism, on the raising of the well being of the people The Leninist Stalinist ideas on Socialist emulation inspire *Soviet patriots to new labour exploits, they have awakened* great energy in the hearts of millions of Soviet people in the name of the great goal—the victory of Communism With the greatest staunchness and insight, you, Comrade Stalin, direct the foreign policy of the Soviet Union *Great coryphæus of science! Your classic works which develop Marxist Leninist theory as applied to the new epoch, the epoch of imperialism and proletarian revolutions, the epoch of the victory of Socialism in our country, constitute the greatest possession of mankind, an encyclopædia of revolutionary Marxism*"*

These encomiums are not confined to any single set of achievements I think it is clear that the hypothesis that the Lysenko controversy represents merely an cultural argument, in a limited field of scientific d does not fully meet the facts of the case, and I say, is having remarkable and immediate Science is regarded as a handmaid to government, everything is regarded as a handmaid to the will the governors

EVIDENCE AND DOCTRINE

A very interesting example is referred to in the press It has been advanced by the Soviet aut for some time past

There has been a considerable outbreak of the Co' beetle pest on the Continent this summer This not been unknown in any part of Europe, there been much evidence of it in the Channel Islands elsewhere, it is something which is a feature of the present year But it has been taken for granted now Soviet circles that these outbreaks have been by the dropping of Colorado beetles from the air American aeroplanes This is now everywhere in the Soviet press stated as axiomatic and the Czechos and other governments have formally accused the "Western Imperialists" of sending swarms of Colora beetles into Czech territory to ruin the potato cro

Thus in his report of June 15, 1950, Paul Merker State secretary of the ministry of agriculture and forestry, Eastern Germany, stated that 'over the whole territory of Saxony and Thuringia, over which American planes had flown 273,838 Colorado beetles had so far been found and in Mecklenburg 103,758 Many witnesses to the criminal activity of the Americans are cited in the report On June 8, 1950 for instance, Heinrich Weber, a road inspector, near Moe hausen, noticed in the area of Road No 247 a plane which was flying very low The same aeroplane was also seen by railway inspectors Alfons Gross and Meimberg of Ahmem Immediately after the passage of the aeroplane Colorado beetles were discovered, and following an *organised search* 9212 were caught Labour Inspector *Wilhelm Becker* of Heimburg Schwerenburg reported that on June 10, *1950* he and many labourers working in the sugar beet fields of the National Estate of Heimburg noticed trails behind an aeroplane flying at a great height from West to East. It later returned westwards Immediately following the flight large numbers of Colorado beetles were detected on the sugar beet fields"

It is now regarded on this non-existent evidence as a scientifically proved contention that, whatever may be the case in other parts of Europe, the Colorado beetle in parts under Soviet control have been introduced by American aeroplanes This is a very dangerous kind of acceptance of stated facts

I think it is rather from the aspect of having facts stated by authority accepted without question that challenge that one must examine the attitude of the Soviet authorities towards science It is the general contention that authority must not be challenged or questioned If you want to know the reason why, you will see it, perhaps, in the text of a broadcast address by Kim Ir Sen, chairman of the council of ministers of the Korean People's Democratic Republic, given over the radio on the morning of June 26 when he explained that hostilities had begun because Southern Korea had attacked Northern Korea

"On June 25 the Army of the puppet Government of the traitor Syngman Rhee began an offensive on the territory North of the 38th Parallel Courageously fighting, the Guards Detachments, which bore the impact of the in stubborn battles, halted the offensive of the troops of the puppet Army of Syngman Rhee The Government of the Korean People s Democratic Republic, having discussed the situation which had arisen, gave orders to our People's Army to go over to a resolute counter offensive and to defeat the armed forces of the enemy"

Whereupon follows Kim Ir Sen's account of the operations to date Clearly it would be a very unwise thing, a very undesirable thing, for anyone within its power

† Since this address was delivered, further confirmation of this view has appeared, in the recent official attacks on the leading Russian physiologists, who are accused of incorrect interpretation of the work of Pavlov This line is of importance since Russia has been admitted by all as in the very forefront of physiology One finds the party line now passed, that it is not so much the actual discoveries of Pavlov as their by products (i e, the materialistic interpretation of physiology) which are to be noted and followed up The usual abject recantations by present senior scientists and teachers are now in progress Future developments will be very significant here

* *Soviet News* Dec 22 1949

question the account that authority has given in statement

ou might say, therefore, that it was clear that what are faced with was an iron assertion of authority nothing else But that is not entirely true The gma still remains an enigma Only recently Stalin self attacked, in the columns of *Pravda* the Soviet lologist, N Y Marr, and said "One might think t before N Y Marr there was no such thing as guistics Marx and Engels were much more modest, y held that their dialectical materialism was a product the development of the sciences, including philosophy, preceding periods" Edward Crankshaw points out it "two years ago the Soviet Minister for Propaganda, exandrov, was denounced and disgraced by Zhdanov maintaining precisely this, instead of arguing that arxism was a complete break with all the past" think that in fact there are signs, not for the first time, at Stalin is less obscurantist than many of those who rround him When he criticises the philologists he rries his warnings to a general contention He says

"A régime has prevailed which is alien to science and men of science The slightest criticism of the state of affairs in Soviet linguistics, even the most timid attempt to criticise the so-called 'new doctrine' in linguistics was persecuted and suppressed Valuable linguistic workers and researchers were dismissed from their posts or demoted for being critical of N Y Marr's heritage or expressing the slightest disapproval of his teachings Linguists were appointed to leading posts not on their merits but because of their unqualified acceptance of N Y Marr's theories"

It is interesting to speculate whether this is a manœuvre r whether it is a departure Time alone will show At any rate, out of the mouth of the strongest, the most inquestioned of the Soviet authorities, Mr Stalin imself, has come that statement It is quite as strong s any statement by critics of the régime, and I think hat some of our apologists for the régime will find it little difficult to defend at once the actions and the riticisms which those actions have called forth

THE PURPOSE OF THOUGHT

But the main conception in the world of the East is conception from which the world of the West thought t had freed itself for ever—that is to say, that the purpose of thought is to serve government, and not to serve the general atmosphere in which alone the progress of mankind is possible, that in itself thought is not desirable, that thought is only desirable when it promotes the interest of government That is a conception to which the Western world is opposed and to which scientific authority here, I trust, will offer the most uncompromising resistance It is a clash, however, which I think is worthy of our closest attention both in theory and as we see, in immediate practical examples, since these are being brought, more and more vividly, with every 24 hours that pass, before our own personal attention

DRUGS AND DRESSINGS IN HOSPITAL

ALL hospital doctors are being sent a copy of the letter on economy in the use of drugs, dressings, &c, which the chief medical officer of the Ministry of Health has already sent to general practitioners in the National Health Service

Hospitals have been asked to draw the attention of all matrons and sisters to the rising costs of drugs and dressings, and particularly to the following recommendations

(*a*) Economy in the use of dressings is the responsibility of the ward or departmental sister and such dressings should not be used for any unauthorised purposes Suitable alternatives should be requisitioned and obtained

(*b*) Matrons or assistant matrons, should regard themselves as responsible for the periodic checking of ward requisitions and assessing issues with the number and types of cases on that ward The practice of wards having an excessive "spare" or 'floating' stock should be discouraged

(*c*) Expensive dressing should, for certain uses and when agreed by the medical officer concerned, be replaced by cheaper but equally suitable products—e g, calico instead of lint as a base for ointment application in dermatological units and "hospital quality" cotton wool instead of *B.P C* quality

(*d*) All abuse and waste of methylated spirits, ether, iodine, and other lotions should be avoided

(*e*) The abuse of adhesive strapping for sticking notices, &c should be avoided Suitable alternatives should be requisitioned and obtained.

It is suggested that, "in order to facilitate the prescribing of standard, in preference to proprietary drugs," the hospital pharmacist should supply to each ward and consultative clinic a list showing the names of the common proprietary drugs in current use and of the *British Pharmacopœia* or *National Formulary* equivalents He should also draw the attention of the hospital medical committee to any possible economies in the use of drugs and dressings, unless they can more appropriately be discussed with individual members of the medical staff

Hospital authorities are asked to consider the periodic pricing of wards and departmental requisitions for dressings in order to draw attention to the high cost of these commodities They "should arrange for the regular quarterly preparation, for their own consideration of a report by the finance officer, pharmacist and supplies officer to show the extent to which economies in quantities and cost are being effected "

Public Health

Food-poisoning in co Durham

AN outbreak of salmonella infection involving 450–500 people in the village of Horden, co. Durham, has been traced to sandwiches, sausages, pies, pig's cheek, and pease-pudding made from a pig's carcass infected with *Salmonella newport* The pig was slaughtered on July 1 because it had symptoms suggestive of intestinal obstruction but, apart from some enlargement of the liver and rather pale kidneys no abnormality was found, and the carcass was passed for human consumption and delivered to a butcher on July 4 The pork, mostly ready cooked, was on sale on July 7 and 8, and symptoms of food-poisoning first appeared about midday on the 8th, the incubation period ranging from 18 to 96 hours The illness usually lasted about five days The organism has been isolated from the patients stools and vomit, and from unsold portions of the pig's carcass

Poliomyelitis

There was a sharp rise in notifications in the week ended July 8, the total being 212 compared with 160 in the previous week, but the increase was largely in non-paralytic cases, which rose from 36 to 73, while the paralytic cases rose from 124 to 139

The principal increases were in Worcestershire, London, and Lancashire The chief centre of high incidence is still in the Midlands though the figures for Warwickshire have declined a little

Yellow-fever "Danger Zones"

The *Weekly Epidemiological Record* of the World Health Organisation for June 28 contains a new delineation of the two vast zones of prevalence of the yellow-fever virus in the tropical belts of America and Africa The delineation which is a revision of that made by UNRRA in 1945–46 was finally accepted by all W.H O member States attending the third World Health Assembly last May Further revision will take place as the situation warrants In Africa plans are being made for a further study of the occurrence of yellow fever In Brazil, favourable reports of the *Aedes ægypti* eradication programme with D D T indicate that the mosquito will have been wiped out of the country before the end of the present year It has already disappeared completely from all ports and cities and is found only in a small rural area in the north-eastern part

BRITISH MEDICAL ASSOCIATION

THE annual gathering of the B M.A opened on July 13 at Southport The representative body continued its discussions there until last Monday, and the meeting of the scientific sections began in Liverpool on Tuesday The proceedings of some of the sections will be reviewed in our next issue

In the course of his presidential address, delivered on Tuesday evening, Sir HENRY COHEN had this to say about undergraduate education [1]

"Man is neither a pantechnicon nor a robot His various organs and tissues, and his body and mind, are so closely knit in maintaining or restoring health that our teaching must be pervaded by a 'synoptic' view If basic medical training be directed to the study of the man, in relation to his external and internal environment it will be misconceived in aim, in structure, and in Theory and practice must be closely integrated without theory practice lacks a guiding hand, and practice theory wilts Students vary in their to learn and to be taught, they are as little suited uniform regimen of study as to uniformity of diet, or hobbies'

Representative Meeting

The annual representative meeting, over which Dr J A BROWN presided, brought to light a growing concern about the well being of the National Health Service and notably of the general practitioner service

THE ACT AND AFTER

Dr REGINALD HALE WHITE (Marylebone) held that the "National Health Service is of course in a mess, and month by month it gets worse" This was not the fault of the profession, which had been allowed practically no say in the build up of it The method of dictation by the Minister and subservience by the profession had been tried for two years For the public the service was a wretched parody of what it might have been, and among doctors there was distrust and cynicism Only by cooperation could a decent service be set up At present it showed "signs of being the most costly and complete fiasco in our social history" The meeting agreed by a very large majority to the following Marylebone resolution

"That this meeting affirms readiness to coöperate with the authorities in building up an efficient and smooth working National Health Service but deeply regrets that all efforts in this direction during the past three years have been frustrated by the cavalier treatment accorded to its representatives in their conversations and negotiations with the Minister'

Mr H H LANGSTON (Winchester) described doctors as frustrated, overworked, tired, and disillusioned All were affected, but general practitioners more than others all were unhappy and becoming cynical The dissatisfaction was not purely financial, it was due to frustration above all else The practitioner must have clinical freedom and access to diagnostic facilities, and he should not be snowed under with trivialities Under existing conditions, what sort of man would enter practice ten to fifteen years from now? The association should publish a detailed plan for reform

Dr R KELSON FORD (Chelsea and Fulham) complained that in hospitals some consultants were being prevented from working by the limitations of the sessions system, and others were being turned out of jobs, registrars were having to enter general practice, for which they were ill equipped, hospitals often lacked necessary facilities, and bomb damage went unrepaired, and general practitioners had not had the Spens recommendations implemented Rehabilitation of the National Health Service was an urgent necessity, but "I doubt if the nation can afford a really efficient service along the lines it is being run"

Dr A V RUSSELL (Wolverhampton) asked that thought should be given to (1) the curtailment of the widespread powers of the Minister, amounting now to dictatorship, (2) the free provision of drugs for private patients, and (3) the penal clauses

Dr T W MORGAN (Kingston on Thames) contended that further needs of the practitioner were (1) that he should obtain pathological and radiological reports direct, and (2) that he should have greater opportunity for admission to advisory and executive bodies The tendency was to exclude the practitioner from everything—a policy which promoted frustration Proposals for reform should be formulated not only by the council but also by divisions and branches

Dr J C ARTHUR (Gateshead), like Mr Langston, wanted a general review of the service, and a motion calling for a detailed programme of reform was carried nem con

A further motion called for the reconstitution of the Amending Acts Committee, to include, as well as ex-officio members, the chairman of the General Medical Services Committee, the Central Consultants and Specialists Committee, and the Public Health Committee, four members elected by the Representative Body, and four members elected by the council Dr H ALEXANDER (Wandsworth) argued that one important function of this committee would be to scrutinise regulations tabled in the House of Commons Dr E A GREGG, chairman of the council, opposed the reconstitution of the committee It would not, he said, be a policy forming body, and he would prefer that the motion was referred to the council which would act on it when the time was opportune The motion was nevertheless carried

REMUNERATION

Dr S WAND, chairman of the General Medical Services Committee, described negotiations with the Ministry of Health over remuneration Practitioners, he recalled, had come into the service on the understanding that the Spens report would be the basis of remuneration What was now being sought was not extra money but what should have been the remuneration from the appointed day The Minister had been asked to indicate what he thought should be in the pool to implement the report He, the Minister, had made it clear that he did not regard this report as necessarily a continuing factor, if the number of doctors doubled, he would not necessarily double the pool, because the work would then be halved Dr Wand remarked that his committee, mindful of what had happened to the dentists, chemists, and ophthalmic opticians, had feared unilateral action by the Minister The important thing at the moment was the betterment factor (or cost of living bonus) The association was claiming 70% betterment—though the correct figure was obviously nearer 100% At present 40% was being given, and the difference between 40% and 70% was equivalent to about £7 million per annum

On April 3 there had been a meeting with the Minister He had conceded that if cuts were made at one point in the service, these might be balanced by an increase elsewhere Dr Wand believed that the Ministry and the Minister himself were not unsympathetic to the practitioners' claim the trouble was the Treasury Health centres had been promised, and through not constructing

1 *Brit med J* suppl. July 22 p 179

the Government had saved much money Yet ng extra was being offered to compensate the practi r and his wife for the continuing difficulties of ising from private surgeries The Spens report had ated that not all of the ablest men should become alists, but the best paid general practitioner was e off than the lowest paid specialist The status of hole general practitioner group was lower than that of pecialist group—this notwithstanding the increasing for a first class general practitioner service as the alist service became more and more finely divided actitioners decided to withdraw, this would not mean they would stop giving services, it would mean ly that the contracts with the Ministry would erminated With one dissenting, representatives rsed last month's resolution by the Conference of l Medical Committees,[2] which decided to prepare for drawal.

ARBITRATION

r CHARLES HILL, secretary of the association, ribed the present arbitration arrangements

e Whitley machinery is voluntary and at present does not ide provision for arbitration, an arbitration agreement ing discussed Section 13 of the Amending Act lays down the Minister s consent is necessary before a case goes to tration In certain circumstances the Minister of Labour refer the case to a court of inquiry Under the Conditions Employment Order, 1940, the Minister of Labour must be fied of proposed withdrawal from the service, for then a ute would exist In the absence of voluntary machinery now) the Minister of Labour might refer the dispute to pulsory arbitration and the association must then accept result If this Minister took no action within three weeks, ors would be free to withdraw

suggest," said Dr Hill, "that the Minister of Labour ld probably choose compulsory arbitration"

motion calling for the immediate establishment of independent court of arbitration, to settle disagree it on remuneration, was defeated "Compulsory tration," Dr ARTHUR declared, "would be most gerous to us" The Spens report was the arbitration nd the report was given in the most favourable cir istances to practitioners Others might hold that ctitioners were not so badly paid "What if a school ster or a professor of Greek were on the tribunal?"

MEDICAL SERVICE COMMITTEES AND TRIBUNAL

Representatives agreed to ask the council to investigate composition and procedure of the tribunal and dical service committees Dr R FORBES (Hendon) d that changes were needed, to protect the practi ner, Dr J A. GORSKY (Westminster) observed that tribunal did not publish its proceedings but only its iclusions, it acted, not judicially, but on a basis of ediency and policy This issue did not affect doctors ne and Lord Samuel was seeking a remedy in a Bill ich he had introduced into the House of Lords

CHANGE OF DOCTOR

Following representation by the General Medical vices Committee, the Ministry of Health has proposed it a patient who wishes to transfer to another doctor ll have to give a fortnight's notice After a lively cussion representatives agreed that they favoured the posed procedure. Dr C W WALKER (Cambridge) soned that change of doctors should not only be free t should seem to be free Doctors disliked treating a ient who would prefer to be under someone else but d not the courage to change, and this new procedure uld increase the numbers of such people Dr D L LLICK (East Herts) argued that the relationship ween doctor and patient was one of confidence, and once confidence was broken, it was better not to try to continue the association Dr A M MAIDEN (Lincoln) expressed an opposite view There was a growing drift of patients towards doctors who gave way to their requests, in the interests of everyone—and of economy —this drift should be checked, and the new arrangement would act as a check Dr DORIS ODLUM (Bournemouth) held that the liberty, hitherto existing, to change doctors freely, encouraged the belief that doctors were people of no importance Dr E A GREGG, chairman of the council, maintained that the unhappy patient should be enabled to escape at once rather than be made to stay—in which event he might cause trouble "I am for free choice at any moment" Dr J A PRIDHAM (Dorset) said that doctors were always protesting that they wanted freedom Yet now, when it suited them, they wanted a new regulation Furthermore, the proposed obstruction to free change favoured the older man who already had a large list Dr WAND fancied that those who spoke against the change were all rural practitioners The towns had floating populations, and since 1948 the number of changes had increased several fold The amended procedure, which was a compromise between two extremes, would have a salutary effect

UNJUSTIFIED CALLS

The meeting concurred with a Hendon resolution that the regulations should be amended to provide the practi tioner with the right to lodge a complaint against a patient who made frivolous or vexatious demands It agreed, too, that the patient should be penalised where his demands were proved unreasonable, but representa tives were unable to suggest a suitable penalty

REPRESENTATION ON BOARDS AND COMMITTEES

Representatives expressed unanimous concern over recent action taken by regional hospital boards to exclude general practitioners and other doctors from membership of hospital management committees Dr W N LEAK (Mid Cheshire) cited an instance where a regional board had refused to reappoint a candidate who seemed very suitable to the executive council Dr T ROWLAND HILL (Marylebone), while sympathetic to the general practitioners' claims, insisted that consultants and practitioners must face this issue together, for if the two branches did not unite their disunity would be exploited, already consultant membership was falling Dr F M ROSE (Preston) held that each board and management com mittee should include one general practitioner Dr FRANK GRAY (council) said that the three sections of the service were tending to develop separately, representation of practitioners would go some way towards countering this trend, and they were seeking it not as a privilege but as a duty Dr H N GREGG (Coventry) said that in his area other professional employees were being forced off the committee, general practitioners would go next, and then the consultants The danger of successful political nominations had to be guarded against, and all groups of doctors must stand or fall together

Dr WAND said that the Ministry had promised early clarification of the offending circular (issued last Novem ber) under whose terms the regional board had dealt with the case described by Dr Leak

Representatives went on to vote in favour of adequate representation, through election or nomination by the profession, of consultants, general practitioners, and, where applicable, medical officers of health, on boards and management committees, and they expressed disquiet at the insufficient and diminishing representation.

Dr C METCALFE BROWN (council) spoke of the contribution that medical officers of health could make to hospital management They were, he pointed out, concerned with infectious diseases, mental deficiency, the maternity services, and tuberculosis

2 See *Lancet* July 8 1950, p 61

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Miss G M SANDIS said that here and there group medical advisory committees were being set up under the ægis of the management committee, and the authority of advisory committees of individual hospitals was being curtailed She saw in this a drive towards placing the hospitals and their staffs under lay administrative control

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Dr FFRANGCON ROBERTS (Cambridge) repeated the assertion he made last year—that direct reference by the practitioner does not mean more work, and that the outpatient department is no filter In fact, he said, the medical outpatient department asks for a great deal more than does the practitioner Two of the arguments advanced against giving direct access were (1) that no history would accompany the patient, and (2) that the general practitioner would be incompetent to apply the appropriate treatment These arguments he could not accept In his X ray department he could easily accept cases from general practitioners, but the hospital had refused permission

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Letters to the Editor

THE INFECTIOUS TUBERCULOUS

SIR,—It is a great pity that any mention of infection in tuberculosis is apt to arouse most unreasonable emotions, even in those who should know better No such fault can be found with the eminently sensible letter from Dr Grenville Mathers and Dr Trenchard (July 8), but your annotation in the same issue showed regrettable signs of "tuberculophobia" Witness the remark that some positive sputum patients are "actually discharged from sanatoria in this dangerous state" Or again, "in their sanatoria they were taught that they were a danger to others" In fairness to the tuberculous, recognised authorities ought not to make such sweeping accusations, which may lead to unjust ostracism, without first examining the facts

There is no proof that the patient with *known* tuberculosis is an important factor in the spread of the disease, in fact, all the evidence seems to point the other way It is well known that in tuberculosis colonies the incidence of clinical disease among the children is extremely small, and those who examine child contacts confirm that it is rare for a child to contract tuberculosis when in contact with a patient who knows that he has the disease Again, the statements of patients who are supposed to have been infected by known contact almost always show an association with some person who *subsequently* was found to have tuberculosis, not with a diagnosed case All this suggests that tuberculosis is a disease of relatively low infectivity and therefore simple to control, and that the educational level of our population is just sufficiently high to ensure that the majority of persons who know that they have the disease will take enough care to prevent it from spreading They should be taught in the sanatorium, not that they are a danger to others, but that they need not be dangerous if they obey certain rules—the difference is important As you so rightly point out, they must be given the opportunity to be careful and they must not be forced into close contact with their fellows, but control of tuberculosis will never be achieved by concentrating our fears upon these treated patients who are comparatively harmless

The real menace is the unknown carrier Much more could be done by better case finding (which means more beds) and by teaching everybody to take simple precautions against the spread of respiratory infections It is a pity that the Ministry of Health no longer publish posters about "coughs and sneezes spread diseases" and more imaginative propaganda is necessary to stir up public opinion against those with careless habits It is probable that if the teaching and enforcement of "handkerchief hygiene" were made compulsory in all schools, it would drastically reduce both the incidence of tuberculosis and also the man hours lost to industry by other respiratory infections Such simple measures are likely to be far more effective than expensive schemes for segregating the tuberculous or promoting research into the nature of the common cold

Brompton Hospital Sanatorium
Frimley Hants — A F FOSTER CARTER

CLINICAL PATHOLOGY

SIR,—Can nothing be done about this "sausage machine" pathology? My old chief, Prof E H Kettle, once said to me that a hospital needs a clinical pathologist in the same way as it needs a chaplain, and I believe that saying contains a profound truth I picture the patient whose "cri de cœur" is passed on through a series of probationer nurses, hospital porters, and technicians, the final message of spiritual comfort being typed by a clerk with the chaplain's signature appended

This is what is happening in clinical path[illegible] Admittedly, senior technicians are highly skilled, they are relatively rare, and even they are no pathologists than ward sisters are doctors [illegible] it is usually not they but quite junior people who see the patients The result is that the [illegible] knows nothing of the patient being investigated cannot check the errors, conscious or un[illegible] clerical or technical, which can and do occur

I am sure that the pathologist's duty is to take part in investigations, both at the bedside and at bench

New Sussex Hospital,
Brighton — M A LESLIE SMITH

COMPULSORY HOUSE-APPOINTMENTS

SIR,—The Goodenough Committee made the sensible suggestion that men and women qualifying in medicine should spend twelve months in house appointments before registration This was already the practice [illegible] the better students The medical student is dazed with study when he qualifies and needs a year to find his feet He must learn to take responsibility within the shelter of an institution before he can take it outside The proposal was generally welcomed and nothing would have appeared simpler than to put it into effect All that is necessary is to designate certain posts as A1 and A2 and to decide that no man will be registered till he has held two such posts The graduate should still be assumed to have the requisite knowledge and skill for the practice of his profession, and should be given the proper opportunity and remuneration for practising within the hospital system

Assuming, as we must, that most of the Scottish and Irish graduates will have to find appointments in England and Wales, the total number required will be 2500 to 3000 a year The Supplement to the *British Medical Journal* of July 27, 1940, gave the total of junior hospital posts as 4143, and similar figures have been quoted in recent discussions on the National Health Service. Some subjects, however, are inherently unsuitable for the newly qualified man, and among these I should put mental diseases, and a good deal of geriatrics and chronic sickness It may well prove that more than half the hospital accommodation in the country is unsuitable for first year graduates

The teaching hospitals have 26,000 beds Not all these will be suitable for the first year graduate, and even assuming that one man looks after only 20 beds there are unlikely to be 1000 suitable house appointments in the teaching hospitals Our Oxford Regional Board has 13,560 beds of which about 2000 are for general medicine, general surgery, obstetrics, gynæcology, and pædiatrics This would imply 40,000 suitable beds in the non teaching hospitals in the country as a whole or another 2000 suitable appointments For a little time, therefore, it may be a tight fit, and it seems doubtful whether there will be enough appointments in general medicine and surgery

When I qualified I did six months' general medicine and then six months in a chest hospital It is desirable that all newly qualified men should have six months medicine if the vacancies are there, but apart from this there should be a wide choice A responsible house physicianship in tuberculosis would be much better than a supernumerary appointment in a teaching hospital The rotating internship of three months in different departments has had its day in America, and I hope we shall not introduce it here It gives a dangerous false sense of competence in surgery and the specialties A man must occupy a job for six months if he is to learn anything or be useful to his chief

All this means that hospitals will have to be inspected and approved as suitable for first year graduate appoint

ts This offers no difficulty It is already done on all scale by the Royal Colleges for the FRCS and lar qualifications and in the U S A it is done on a large scale by the Council on Medical Education Hospitals of the American Medical Association An roved hospital must not have less than 85 beds and it have reasonable facilities for radiology pathology, autopsies and a proper records system and library is usually required that one member of the staff uld act as Director of Medical Education assuring articular that there is a weekly case conference for housemen and the surrounding practitioners No pital in the U S A can hope to get good interns ess it is approved and there has been a tremendous provement in hospital standards as a result Inspection and approval are carried out on much the ne lines as the King Edward's Hospital Fund follows this country The postgraduate deans could easily ganise similar arrangements using a panel of consul nts as visitors It may take a year or two but what s e hurry? Shortage of residential accommodation may a difficulty, but it is not a bar There is no need for house officers to live in For the last five years I ave run a busy ward of 21 beds with two house officers junior who lives in and a senior who lives out Payment must be on the Spens scale The jobs are no good unless ney are responsible and they must be paid a proper age One of the weaknesses of the intern system in ne American teaching hospitals is that the intern may nd no work left for him by the students and the egistrars There is no place in this country for underpaid upernumerary housemen

I am not alone in thinking that the B M A committee on the Training of the General Practitioner went sadly astray in its recommendations and one does not know whether to laugh or to cry over its attempts to regulate not only the life but also the thoughts of the family physician Some of our friends on the committee appear o have walked with kings and lost the common touch Our young doctors have to spend six years in the medical school a year in compulsory appointments and eighteen months or more in the Services Couldn't we perhaps ave them to run their own lives at the end of that ime? Osler got into hot water for suggesting chloroform at sixty, but I am sure he was right in saying that the effective moving vitalising work of the world is done between the ages of twenty five and forty" There is no excuse for a second compulsory year's house appointments after registration, as suggested by the B M A, and this consideration should not be allowed to affect the house appointments before registration

Radcliffe Infirmary Oxford L J WITTS

THE CHILD AND HIS HEREDITY

SIR,—Your annotation of July 8 on my paper given o the annual conference of the National Association for Maternity and Child Welfare contains two errors of the and that can easily be made in reporting the spoken word As they are points of substance I should be grateful if you would allow me to correct them

It is stated that in 1937 among children of school age 37 per 100,000 were blind This should be 1923, not 1937 I was quoting from Prof Arnold Sorsby s mportant monograph *The Causes of Blindness in England and Wales*,[1] in which he shows that whereas in 1923 the rate was 37 per 100,000, with one third due to congenital and hereditary causes, by 1948 the figure had been reduced to 21, but that of these two thirds were congenital or hereditary

Later I am quoted as saying that if the average age of mothers could be reduced by five years, the incidence of congenital malformations of all kinds would be cut by about half My actual statement was " if the average age of the mother at the birth of the child were reduced by five years the incidence of mongolism would be cut to less than half and there would be an appreciable reduction even if it were not so striking in a number of other congenital defects such as congenital hearts and hydrocephalus"

London School of Hygiene and Tropical Medicine W C 1 J A FRASER ROBERTS

[1] Medical Research Council memorandum no 24 H.M Stationery Office 1950

ACTH IN RHEUMATOID ARTHRITIS

SIR,—Dr Dresner and Dr Pugh (July 15) say that they gave intravenous adrenaline to six rheumatoid patients by continuous drip over 3-7 days with results not superior to the intramuscular route I would like to suggest that rather less dilute solutions be given intravenously intermittently—i e, each infusion to take not more than 20 minutes and to be repeated three or four times a day Such a course of action would be more in line with my experience and might avoid deterioration of adrenaline in weak solution the solutions being freshly made just before transfusion

St Margaret's Hospital Epping Essex FRANK MARSH

LARYNGEAL VERTIGO

SIR,—I suggest that the explanation for the syndrome termed laryngeal vertigo discussed in your leading article of July 15 is somewhat as follows

In a person with a long thin neck who suffers from a chronic cough all the veins—unrestricted by much muscle and fat—above the level of the manubrium sterni will become distended during bouts of coughing The distension will probably be more marked in the large cervical veins whose walls contain the maximum of elastic tissue in the area than in those situated more distally On the other hand in a person with a short fat neck—where there is much restricting fat and muscle—the total amount of distension of the shorter "large" cervical veins is likely to be small Furthermore, during bouts of coughing the hypertrophied sternomastoids and anterior scalenii and the omohyoids will themselves compress the internal jugulars The drainage of the cerebrospinal veins will be further restricted, not only in the thorax but also in the abdomen towards which the emphysematous lungs descend and where the large deposits of fat indirectly compress the inferior vena cava when the abdominal muscles contract The hard jerky series of unproductive coughs against a closed glottis aggravate this feature, which will rapidly increase the distension and in time, produce permanent dilatation of the cerebral veins Considerable alterations in pressure will thus be produced in veins draining the brain whose nerve tissue has probably been additionally affected by the alcohol I suggest therefore that an investigation of the cerebral veins, particularly of their calibre, may help to elucidate the etiology of this disorder

London N 7 I H MILNER

SIR,—Your leading article of July 15 is of particular interest to me because two weeks ago I saw a case of laryngeal vertigo

A tall plethoric, obese man aged 50, was referred to me by his doctor on account of "cough and blackouts" He had had a left lower lobectomy for bronchiectasis in 1948

He was on holiday in this country from Canada, and one day, when visiting one of our large multiple stores he had a severe dry coughing spasm which started as a tickle in his throat He fell to the floor with momentary loss of consciousness He thought that there had been jerking (convulsive movements) of both his arms and legs, no tongue biting and no incontinence The attack was followed by a drowsy feeling he did not actually go to sleep, though he felt he would have liked to have done so

Incidentally, his blood pressure was 150/95, and both Wassermann and Kahn reactions were negative, but these latter results may have been masked by repeated courses of penicillin for his bronchiectasis

Three exactly similar attacks followed the first, and all three occurred while sitting in a chair, after a dry coughing bout which was preceded by a tickle in the throat

Admission to hospital was advised for full neurological investigation, but as he was returning to Canada within the next few days this course could not be pursued, and he was recommended to see his doctor in Canada immediately on his return

Chest Radiography Centre
Postern Street Nottingham

A E BEYNON
Chest Physician

THE "GENERAL ADAPTATION SYNDROME"

SIR,—The enthusiasm with which a London audience is reported to have greeted Dr Hans Selye's recent Heberden oration seems to assure for the general adaptation syndrome a prominent place in future British text books Your timely publication, last week, of Professor Pickering's thoughtful and penetrating analysis of Selye's contribution to rheumatoid arthritis should help to forestall this possibility, and may also bring to the first enthusiasts some more sober second thoughts

Undoubtedly Selye's hypothesis has many attractions it has a background of elaborate experimentation and a mass of apparently supporting literature, it is fascinatingly presented and illustrated with beautiful photomicrographs It has all the charm of a synthesis, a bringing together of a mass of hitherto confusing and apparently unrelated observations The recent discovery of the effects produced by adrenocorticotropic hormone (ACTH) and 'Cortisone' in rheumatoid arthritis seems at first sight, to demonstrate its validity

Yet, as Pickering rightly points out, the great discovery of the Mayo Clinic group "was made quite independently of this hypothesis" It may be well to recall that Selye [1] originally reported that rats deprived of one kidney and also of their suprarenals or thyroid, given only saline to drink and injected with huge doses of deoxycortone (4–6 mg daily) developed within 14–26 days (if they survived) an arthritis resembling "that seen in acute rheumatic fever" Only later did Selye [2] claim that the joint changes in these rats" might be called an experimental replica of rheumatoid arthritis" There was little in this to suggest, at the time, that a suprarenal gluco corticoid might *relieve* rheumatoid arthritis

It is sometimes overlooked that the hypothesis of the general adaptation syndrome (as first fully annunciated in 1946) conspicuously failed to predict the result of the Mayo Clinic experiment Surely the acid test of the validity of any hypothesis is can it predict the results of future observations within its compass? If it cannot do this, it is scientifically worthless

Looking back on the distant past of three years ago, before the Mayo Clinic discovery, it now seems remarkable that a man of Selye's brilliance did not foresee what was to come and, in his textbook, was still saying [3] "it is noteworthy that corticotrophic pituitary extracts frequently produce arthritis in the rat" This observation is now apparently explained by his "factor X"

Following the Mayo Clinic discovery, it seemed almost as though the harmful effects of deoxycortone bore no relation to anything that actually happens in the animal body, particularly since, as Selye [4] says, deoxycortone "has not been definitely proved to be produced by the adrenal cortex" This difficulty was apparently overcome by a prominently published [4] experiment on castrated, partially nephrectomised rats in which naturally occurring mineralo corticoid (desoxoc was reported to produce, in rats, hypertension and changes, but not, this time, arthritis The b pressure was measured by the tail cuff method and "very light ether anæsthesia," which has been elsewhere to have certain disadvantages So far I know, this experiment has not yet been confirmed Selye's brilliant technical skill is hard to duplicate so his experimental observations tend to be taken "as read" by most of his followers

The general idea of the general adaptation syndrome as now presented is, as I understand it (and I share with Pickering that reservation), that the body reacts to all forms of stress by hypophyseal stimulation of the suprarenal cortex As Selye [5] now says, "all stressors cause an ACTH discharge " One of his previous statements was less definite "It must be admitted that the increase in corticotrophin production during stress has never been measured directly, it was assumed to occur only because of the resultant adrenal changes"

We are led to believe that under the influence of ACTH (or perhaps "factor X") the adrenal cortex sometimes reacts, for some inexplicable reason, by the production of an excess or "improper balance" of mineralo-corticoids, the result is a host of human ills Yet how do we know that the cortex ever does put our mineralo-corticoids under stress? As Selye himself has said,[6] "stress causes an increased elimination of gluco-corticoids but a concomitant increase in mineralo-corticoids is postulated almost entirely on indirect evidence"

I hope, Sir, that I have said enough to indicate how tenuous the evidence is on which the whole elaborate structure of the general adaptation syndrome is founded. Even supposing that some of Selye's *deductive speculations* ultimately prove to be right, what do they tell us of practical value that we do not already know from other sources?

Many students, postgraduates, even teachers, are now spending long hours searching through the tangle of Selye's voluminous writing in quest of some essential truth which they feel must be there I think that we should advise them to spend their time in better ways

As Pickering rightly warns, "the history of medicine shows how great is the tendency for a tentative and imperfectly documented hypothesis to assume the guise of a so called fundamental principle"

Department of Medicine
University of Edinburgh

A P MEIKLEJOHN

THE SIGNIFICANCE OF CORTISONE

SIR,—It is with some hesitation that I write to offer a few criticisms of Professor Pickering's article of July 15 on the significance of the discovery of the effects of 'Cortisone' on rheumatoid arthritis In his review of worn out hypotheses of this century he suggests that psychosomatic concepts of the ætiology of diseases should be dismissed as the focal sepsis theory has already been dismissed by all critically minded students of medical progress He denies the existence of the widely accepted correlation between particular personality types and the occurrence of particular diseases, of which perhaps the best examples are ulcerative colitis, migraine, hypertension, and peptic ulcer He ignores the many instances in which the onset of various diseases such as thyrotoxicosis, ulcerative colitis, and hæmatemesis from peptic ulcer may follow closely upon severe emotional shock In dealing with the effects of psychotherapy he is more cautious, qualifying his dismissal with the words

1 Selye H Sylvester O Hall C E Leblond C P *J Amer med Ass* 1944 124 201
2 Selye H *Brit med J* 1949 ii 1129
3 Selye H Textbook of Endocrinology Montreal 1947 p 84
4 Selye H *Brit med J* 1950 i 203
5 Selye H *Ibid* p 1387
6 Selye H Factors Regulating Blood Pressure Johnson Jr Foundation Publications New York 1948 p 88

ldom and "repeatable" That he is out of sym hy and perhaps out of touch with present day ceptions of the status of psychosomatic factors in ases of hitherto unknown aetiology is apparent from way he couples the rheumatic diseases in which few e suggested that such factors are of great importance h ulcerative colitis and peptic ulcer in which their role accepted

n considering Hench's original interest in the effect pregnancy and jaundice on rheumatoid arthritis and ve s work of wider scope I await with interest any ht which may be thrown on the striking negative relation which exists between pregnancy and peptic er, and the effect of cortisone on chorea in view of the casional occurrence of a severe form of this disease in egnancy

Cardiff G R VENNING

TRIBUTE TO PROF MATTHEW STEWART

SIR—Prof Matthew I Stewart is retiring at the d of the summer after holding the chair of pathology this university for 33 years He has made notable ontributions to pathology and taken a leading part the affairs of the Pathological Society whose journal he as edited for 16 years

It has been decided by his friends to commemorate is unique service by the foundation of a lectureship hich shall bear his name and afford an opportunity t least once in every generation of students for a istinguished pathologist to visit Leeds and to discuss ome important development in pathology In this ay the name of Matthew Stewart would be kept in memory It is also hoped to present a bronze medallion ortrait of Professor Stewart to the Medical School

Subscriptions may be sent either to the National Provincial Bank 2 Park Row, Leeds or to the hon reasurer, the School of Medicine Leeds 2 Cheques hould be made payable to the "M I Stewart Retirement Fund"

C R MORRIS
Vice-Chancellor
J W McLEOD
Dean of the Faculty of Medicine
W MACADAM
Hon Treasurer
D F CAILLIE
D CHAMBERLAIN
H R DEANE
J H DIBLE
I T INGRAM

The University Leeds 2

INOCULATION CERTIFICATES REQUIRED ABROAD

SIR,—From somewhat inconvenient experiences during recent world tour, I have realised the necessity of aying strict attention to the various regulations made y Eastern governments regarding vaccination and noculations

Instructions on this matter are continually being ltered without notice and it is time that some uniform ystem was evolved I understand that the World Health Organisation is giving some attention to the atter In addition to vaccination some governments isist on protection against yellow fever and typhus herefore it is probably safest to be protected against hem all As regards cholera, it should be emphasised hat the Egyptian government lay more stress upon this han any other, and may on occasion actually segregate person who is not thus protected This inoculation must ave been performed six days before landing on Egyptian erritory These regulations apply to passengers in ransit as well as to visitors to Egypt Little or no ttention is paid to inoculation with TAB, but smallpox accination is considered to be of paramount importance

Many governments require inoculation and vaccination ertificates to be authenticated and stamped by a overnment medical officer or medical officer of health he reason for this is to ensure that the certificate has been issued by a reputable qualified doctor As it is not always certain at any time which governments do insist upon this authentication it is in the passenger's interests for all certificates to be officially stamped

In view of these complications I am suggesting that the British Medical Association secretariat should maintain an up to date dossier of information on the requirements of all the various governments They would then be in a position to advise medical practitioners as to what instructions they should give to their patients who are going abroad by sea or by air I also think that a notice on the lines of my second and third paragraphs should be distributed to all doctors for their information

London W 1 PHILIP MANSON BAIR

*** As things stand, the wisest course for intending travellers is to consult the officials of the airline concerned who generally have the latest information —ED L

R A M C WAR MEMORIAL

SIR,—The Roll of Honour of all ranks of the Royal Army Medical Corps who gave their lives during the Second World War (Sept 3 1939, to May 8, 1946) is now complete and copies have been sent to all the next of kin with whom we have been able to get into touch

I shall be glad to send a copy to any who, owing to a change of address or other cause may not have received the original notice

The roll is included in an illustrated booklet describing our Book of Remembrance, the Memorial Window and other Corps memorials in Westminster Abbey and its precincts and will be sent to any of your readers who are kind enough to send a donation to our fund which is devoted to helping all ranks of the R A M C who took part in the war and their families

R F BAINSITH
Major General Hon Secretary
R A M C War Memorial Fund

74 Victoria Street
London S W 1

Medicine and the Law

Legacies to N H S Hospitals

TESTATORS it seems are disinclined to leave their money to hospitals which have been handed over to the State Their dispositions when they seek to bar anything like a nationalised hospital from obtaining any benefit, are making work for the judges who have to interpret their wills Two cases reported in the *Times* of July 7 illustrate the kind of difficulty encountered

One case concerned the will made by the widow of Sir John Bland Sutton She directed her trustee to hold an endowment fund (amounting to over £23,000) on trust after providing for a Bland Sutton scholarship at the Royal College of Surgeons to pay the income to the Bland Sutton Institute of Pathology at the Middlesex Hospital If the institute ceased to be carried on, or if its name was changed, or if the Middlesex Hospital were nationalised or passed into public ownership, then the trustee was to transfer the endowment fund (both capital and income) to the Royal College of Surgeons The question for the court was whether any of those events had happened, and, if so, at what date

Mr Justice Danckwerts came to the conclusion that none of them had happened yet and therefore the college was not yet entitled He scrutinised the various relevant sections of the National Health Service Act of 1946 for guidance, bearing in mind that the Middlesex was a teaching hospital, and that the Bland Sutton Institute was part of a medical school at the date (July 5, 1948) when the Act came into force In spite, he said, of any popular view which might have emerged from the "possibly uninformed discussions" accompanying the passing of the Act, he was of the opinion that the old Middlesex Hospital had not as a whole been nationalised

or passed into public ownership, part of its property —namely the medical school (the most relevant part for the purposes of Lady Bland Sutton's will)—had been transferred to, and vested in, a corporate body (the council of the school) which was neither nationalised nor publicly owned The institute and its work continued though the institute might now be administered by a differently constituted authority

The other case arose over the will of Mr J E Frere, who died in Hampshire early in 1949 He bequeathed a legacy of £6000 to the Fleet and District Hospital if still at his death conducted on the voluntary system and not taken over by the State There was general agreement that, as the hospital had come under State control, this legacy failed Mr Frere had also bequeathed his residuary estate to the same hospital "for endowment purposes" The first question for the court was whether the condition which had been expressly attached to the frustrated gift of £6000 was to be tacitly attached also to the bequest of the residue Was the bequest of residue valid, and if so, did the money go to the Farnham Group Hospital Management Committee or to the South West Metropolitan Regional Hospital Board? If the bequest was not valid the residue would presumably go to the next of kin Mr Justice Wynn Parry found obliged "with considerable reluctance" to hold no condition was attached to the bequest of the and therefore the money would go to the body now standing in the shoes of the Fleet and District Hospital. ingenious argument was put forward on behalf of next of kin Counsel contended that the gift to hospital could not be valid unless it was, in the te legal sense, charitable The gift of residue, having been made "for endowment purposes," ought to fail because the hospital had ceased to be a charity The judge however, followed a recent decision by Mr Justice Harman (in the case of Deans' Trusts) to the effect that a hospital does not cease to be a charity because of the operation of the National Health Service Act[1] Moreover section 59 of the Act enables the new hospital management committees and regional hospital boards to accept gifts "for purposes relating to hospital services" or research Thus, in spite of the reluctance expressed in the earlier part of Mr Frere's will to endow hospital services which are provided by the State and not under a voluntary system, the new régime will benefit and the next of kin is disappointed.

1 See also *Lancet* 1949 i 882 *Ibid* ii 855

Parliament

The Medical Bill

THE Medical Bill was considered in committee in the House of Commons on July 14 On clause 2, which enables the General Medical Council to fix a period of not less than twelve months internship before registration, Sir HUGH LUCAS TOOTH moved an amendment providing that no confirmatory order should be made by the Privy Council unless a draft had been laid before Parliament and had been approved by resolution of each House Mr ANEURIN BEVAN, Minister of Health, accepted this amendment in substance though not in form He also accepted in principle an amendment, by Mr SOMERVILLE HASTINGS, that where physical disability rendered an appointment in surgery or midwifery impossible the council might accept an equivalent period of satisfactory service in medicine or in a health centre in lieu thereof

THE COMPULSORY INTERNSHIP

Commander A H P NOBLE raised the case of those whose medical studies were interrupted by the war, and who would otherwise have qualified before the Bill came into force Many of them were very keen to get into practice as soon as possible Dr BARNETT STROSS thought that married men might be given an opportunity of opting out of the year's internship Moreover not everyone wanted to be registered in the full sense If a man had completed his medical studies and obtained his degree, he might wish to work as a physiologist for the remainder of his life, or go on to biochemistry If such a man wanted to come back to practise he could do so by serving a year in hospital Also he thought that some safeguard should be given against the possibility of favouritism in regard to the certification of "satisfactory service"

Mr HUGH LINSTEAD said he had no doubt that the Minister had in mind some period of time before the new arrangements were brought into operation, so that there could be no suggestion of a breach of faith with existing medical students As for the period of internship, he was quite sure that the Privy Council and the G M C would not use the important power given to them in any callous way, but, if the Minister could indicate that there was a limit of a year in his mind, that would remove any fear that the period could be extended indefinitely Medical students were anxious to know what their position would be if a certificate of satisfactory service was refused them Would there be a right of appeal, or would they be completely at the mercy of the hospital or the qualifying body under whom this period of internship was served?

Dr A D D BROUGHTON urged the Minister to give most careful consideration to the cases of hardship which might arise if this clause was passed unamended He quoted the case of a medical student who was a retired barrister His age could be judged by the fact that he would draw his post-war credit very soon This man wished to spend the remainder of his life as a medical missionary in India, but if he had to put in an extra year's work of intern duties after qualification all his plans would be upset The British Medical Students' Association desired that all present medical students should be exempted from the requirement of internship Dr Broughton did not think it would be necessary to go so far as that, but he hoped that some right of appeal would be allowed to those who would suffer by the operation of the Bill as it stood at present

Surgeon Lieut-Commander REGINALD BENNETT supported Dr Stross's plea for those who might not intend to practise clinical medicine after finishing their training He also wanted to know what would constitute "unsatisfactory service" Dr H B MORGAN also favoured a right of appeal Mr IAIN MACLEOD pointed out that when the new system started there would be a wastage for one year at least, of general practitioners under the National Health Service It was for Parliament to discuss at what point the service could afford that wastage It might be expedient for a limited period to allow doctors after qualification to go into practice in under-doctored areas, to allow them to act as assistants to group practices, or work in the health centres which it was hoped would increase in number

Mr HASTINGS said there were very few cases in which a surgeon or physician in charge would feel justified in saying that a man's service was unsatisfactory, and if the right of appeal was conceded there would be even fewer Mr BEVAN, in reply, said he wanted to remove any idea that the Minister of Health was in this Act accepting responsibility for the content and management of medical education He was not It was necessary to have a sense of proportion and keep an even balance between the legitimate affairs of the medical student and the requirements of the public It was not the duty of Parliament to let loose upon the community what might be regarded as under-educated doctors, or to protect individual doctors from what might appear to be hardship But the implementing of the Good enough proposals meant that the State intervened and altered the plans which the private citizen made for himself when he intended to go in for medical training Therefore Parliament must try to see that the arrangements made bore as little harshly on the citizen as consistent with the public interest

The new requirement was not going to be upon the student immediately, it would take between a year and two years to make the arrangements

ld be quite improper for the State to say that a doctor d not be fully registered and enter into general tice without serving an intern year in an approved blishment and at the same time to fail to find a e for him The two must go together The time starting the scheme could not be fixed until the ernment had reviewed the establishments and made posts available He thought that with the passing another year or two most ex Servicemen would have the medical schools and therefore there would not very much hardship in that connection

Besides providing posts in hospitals they had also to ure that financial hardship was mitigated as far as sible It was therefore proposed to create posts rying a salary of £350 a year for the first six months l £400 a year for the second six months with a luction of £100 for board and lodging These he ought were fairly generous sums indeed it was re money than many general practitioners earned in ir first year of general practice at any rate before war It was not the present intention to make any owances for married students but the point would be ther examined to see if anything more could be done that regard

Dr CHARLES HILL asked the Minister whether this uld be technically applied at the beginning of a ovisional post for entry into the National Health heme He said it was the superannuation implication ich he had in mind

Mr BEVAN said this was a very special point but ese sums must be carried on the Ministry of Health ote and not on the University Vote or the Education ote Those doctors who were provisionally registered ould be employees of the hospital and he thought it llowed almost inevitably that the term of service in e National Health Service would date from the beginning of the internship But he hoped that Dr Hill ould not keep him strictly to that For all purposes nnected with his work in the hospital and any work hich might be given to him arising out of his internship e intern was a doctor

Some people had asked whether it was fair to a person no had made plans based on the assumption that his aining would come to an end at a certain time to add other year but if they were to carry out the recommendations of the Goodenough Committee they must gin at some point or another If they began when the udent came in that would mean that the scheme ould not come into full operation for seven or eight ears He hoped too that he would not be pressed to ve concessions on grounds of hardship Why should ey send out into general practice one doctor who was ss well trained than they thought he ought to be hat would be a detriment to the patient and not good or the doctor When the date fell it should fall upon ll medical students as otherwise the exceptions would o through life with a black mark

There was a good deal of anxiety about the question satisfactory service, and that could be understood ecause it was so difficult to define Nevertheless it was ready in use He was informed that it was similar the signing of certificates now required to show a tisfactory attendance at courses of instruction before student could sit for his final examinations These rtificates covered conduct as well as attendance They presented the opinion of all the people under whom e student had worked Similarly, certificates of satisction would reflect a number of opinions and there ould be no possibility of victimisation by a single ividual on personal grounds The certificate itself as given by the licensing body—the medical corporation mediately concerned He hoped, therefore, that he ould not be pressed to give a right of appeal They uld not have an appeal against a board of examiners Mr Bevan hoped that he had reassured the student at he was not putting himself in the hands of someone o might have a spite against him It must be remembered that when a person reached this stage he was ovisionally registered It was not the intention to t up another hoop through which he had to jump, t to give him a year's experience in association with ecialists with a diverse kind of hospital work so that en he became a general practitioner he would be a better craftsman There was no reason why, if an intern had 'boobed it,' he should not have another opportunity in another hospital to serve another year

The present intention was to bring the arrangements into operation everywhere at the same time The power to vary the period was merely for the purpose of emergency

Exemption of the "deviationists" who decided to go into biochemistry and other things, was in Mr Bevan's opinion impracticable If a man qualified and then asked to be exempted from the intern year on the ground that he did not wish to practise, Mr Bevan thought he would be a very queer kind of medical animal They would not know what to do with him afterwards

Surg Lieut Commander BENNETT The universities are full of them

Mr BEVAN said that might be so but so far as he knew nothing at present prevented them from practising clinically if they wanted to Would such persons say that they did not wish to be put on the Medical Register? He did not see how a provision could be framed putting them in suspense as it were They must come down on one side or the other

Mr HASTINGS moved an amendment providing that a person provisionally registered under the Act should have all the duties and privileges of a registered medical practitioner but only while serving in the approved hospital or institution to which he was attached He said that while serving in a hospital the intern should be able to order dangerous drugs and when he was the only person who had attended a patient to sign a death certificate Everybody including the public should know exactly what were the powers of the provisionally registered doctor and these should not be left to be defined by regulations

Dr MORGAN thought the amendment would do the health service harm and the doctor an injustice if his duties and privileges were limited only

Dr HILL said that if the intern were to be regarded as a fully registered practitioner for a wide range of purposes this year of training would fall into dispute It should be regarded as an essential part of medical education I say that to equate the provisionally registered with the permanently registered man merely leaving an interval of time to pass between them seems to suggest that the standard of registration is reached with provisional registration and that this final year is a kind of burden imposed by the State" Until they had seen the picture of the provisional year and the form that the internship took, he doubted if they were in a position to decide that all the privileges of registration should go with provisional registration

Mr BEVAN said that here he was in fairly general agreement with Dr Hill It was difficult to describe this intern year properly, but its equivalent did exist in other academic fields Unless they were careful it would lose its status It was not suggested that the doctor was not fully educated when put on the provisional register, but it was held that a year's satisfactory experience of this sort was necessary for his final equipment as a general practitioner In the institution he could sign death certificates and give drugs if it was appropriate for him to do so in the circumstances of the case

The amendment was by leave withdrawn

DISCIPLINARY PROCEDURE OF G M C

Mr BEVAN accepted in principle an amendment moved by Lieut Colonel WALTER ELLIOT covering with a statutory provision the preliminary stages of the investigation of complaints and ensuring that a person taking part in the screening" should not take part in the judging

Dr HILL moved an amendment to secure that what he said was the almost uniform practice of the General Medical Council—that there must be a statement by the complainant—should become the uniform practice He said that there had grown up in the last few years a habit on the part of Government departments, including the Ministry of Health, of not complaining but sending the papers along in the hope that the G M C might do something about it The object of the amendment was that, whether the complainant be an individual, a body

or a Government department, there should be a formal complaint to the G M C

Mr BEVAN said he must resist the amendment It meant that the disciplinary committee of the G M C would be an arbitrator between the doctor and a Government department That placed the department in an entirely false position It did not follow that the Ministry of Health in this case should come to a conclusion about the doctor at all It merely meant that in the exercise of the administrative duties placed upon him under the health statutes the tribunal had brought to light evidence that would appear on the surface to be evidence that the G M C should see in order to make up its mind whether or not it should consider putting its disciplinary machinery into motion That seemed to be a reasonable protection for the public, but it would not be reasonable to expect the Minister of Health himself to have a preliminary investigation on matters falling within the jurisdiction of the G M C's disciplinary machinery and to pre-hear the case

After further debate, Dr HILL said that what had happened was this Allegations had been brought against a practitioner and they had gone through the Minister's own machinery and culminated in the rejection by the tribunal of the allegation Then the papers, which could only relate to matters within the field of the Minister's own tribunal, had been sent to the G M C In other words, there having been failure to secure the lesser verdict of removing the man from the service, they had tried the other way to obtain the higher verdict of removing him from the Register altogether That was the point he hoped the Minister would look into

Mr BEVAN said he doubted very much whether the case was as Dr Hill had described However, he would look at the matter, but he hoped that he would not be pressed too far, because once a Government department was asked to formalise evidence against the practitioner they were discriminating against the general practitioner in the most dangerous way He hoped the amendment would not be pressed at this stage

Further consideration of the Bill was adjourned

Disease in the Colonies

In the House of Commons on July 11, Mr J S ARBUTHNOT drew attention to the relative lack of progress in malaria control in Africa With the aid of demonstration antimalarial teams formed by the World Health Organisation, 15 million people had been protected in Brazil, 500,000 in British Guiana, and 4 million in Venezuela, 5 million people had been protected under one of the Indian schemes, and 6 million in Ceylon In Ceylon the death-rates per 1000, which averaged about 21 in the ten years before 1947, had fallen to 13 2 since spraying with D D T had begun The Colonial Empire in Africa presented a distressing contrast There had been some small schemes but they were confined in the main to the towns

Mr T F COOK, under-secretary of state for the Colonies, in reply, said that since 1940 over £600,000 had been provided from Colonial Development and Welfare Funds for control schemes in these territories More than £250,000 had been devoted from the same source for research into insecticides and for drainage and irrigation In addition, considerable amounts had been provided by the Colonial governments themselves In large centres malaria risk had been reduced to a negligible level and there had been steady progress in smaller centres Malaria control, however, presented greater difficulties in Africa than elsewhere, because there were two types of malaria-bearing mosquito One bred under shade and the other in the open, thus neither bush clearance nor artificial shade was efficacious Another difficulty had been that antimalarial drugs did not have the same conspicuous success in Africa as they had in other parts of the world, but a method of thoroughly efficacious treatment had now been worked out Colonial governments were aware of the many types of assistance provided by W H O, and he was sure that there would be a steady increase in the number of requests to the organisation An international conference on malaria which was to be held in East Africa next November and December, under the joint auspices of W H O and the Commission for Technical Co in Africa South of the Sahara, and the prob malaria in Africa would then be exhaustively stu

On July 12 Mr JAMES GRIFFITHS, secretary of for the Colonies, said that over the past decade had been striking improvements in the health of Colonies This was largely due to the control of The Government were also determined that every method should be brought to bear on tuberculosis incidence of which in the Colonies gave rise to much concern He now had a special consultant tuberculosis and with his assistance plans had been for a coordinated attack on the disease throughout Colonial territories

Mr M PHILLIPS PRICE expressed concern about effect of medical and welfare work on the popul problems of both Africa and Asia In a large part Africa one African peasant produced food for two no more Mr Price believed, however, that it be quite possible to increase food supplies by deve a communal coöperative method of farming based the tribal system

Dr H B MORGAN said a very fine piece of work been done for nursing and the health services in West Indies, but he hoped the Government would something to reduce the amount of capitalistic expl tion in those Colonies Disease was rampant there only venereal disease, which the foreigners brought but malaria and tuberculosis

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On July 12 the Royal Assent was given by commis to the Midwives (Amendment) Act

Obituary

EDWIN MATTHEW

M A, ABERD, M D EDIN, F R C P E

Dr Matthew, emeritus professor of clinical medicine in the University of Edinburgh, who died on July was a distinguished member of his school He was born in Aberdeen and attended the university there but his whole medical life was associated with Edinburgh In 1897 he graduated M B, with first-class honours, and he obtained the M D, degree with gold medal in 1908 While an undergraduate he gained Vans Dunlop scholarship, and on graduation he awarded the Ettles scholarship as the most distinguished student of his year He was house-physician to Thomas Fraser in Edinburgh Royal Infirmary, and th held a similar appointment in the Edinburgh Roy Hospital for Sick Children He became a member of th Royal College of Physicians of Edinburgh in 1902, was elected a fellow four years later

He was appointed assistant physician to Edinb Royal Infirmary in 1909, and was physician in charge wards from 1921 to 1936, during the last two years holding the Moncrieff Arnott chair of clinical medicine In his earlier years he held the post of physician Leith Hospital For five years he represented Royal College of Physicians of Edinburgh on the General Medical Council

Matthew was recognised as an outstanding teacher by all associated with him, especially by that critical body, the students He held the view, on which many of us are agreed in theory, but to which he rigidly adhered in practice, that the teaching of undergraduates and postgraduates is entirely different To the latter alternative arguments and theories must be presented so that they may be in a position to make their own choice, but undergraduates have not the necessary knowledge, and their teaching should be simple, unconfusing, and dogmatic On this method Matthew's success as a teacher was based, and by it he earned the gratitude of his students

In private practice successfully, though perhaps unconsciously, he acted fundamentally in the same manner His advice to patients was clear and definite and he was not prepared to modify it, or to undertake treatment except on the lines which, he was confident were in the best interests of the patient A few doubtless were annoyed by this determination, but his

e and the esteem of his patients were evidence
ley appreciated his combination of candour and

essor Matthew believed in the paramount import-
of being a good general physician His chief
interests lay in diseases of the kidney and in
ar hypertension and he stimulated many of his
s to carry out research on these subjects He was
wer of various forms of sport and was himself
t golfer and curler and a keen angler
is survived by a widow a daughter, and two sons,
whom has followed his father s profession

Appointments

K IAN O M M R C S appointed factory doctor Fornorth district Lanes
C R M B Dub D M R Diag consultant radiologist Bristol clinical area
B L M B Lond F R C S M R C O G consultant obstetrician and gynaecologist Bath clinical area
R A M D Lond D P M consultant psychiatrist Plymouth clinical area
R A C S M B Edin F R C S E consultant ear nose and throat surgeon Birmingham (Dudley Road) group of hospitals
R F R M M A M B Edin D T M M O (S H M O) Torquay Hospital
TILL K P S M B Camb F R C S consultant surgeon Exeter clinical area
D F M L C P E D P M D P M consultant psychiatrist Barrow and Furness Hospitals
TH K B M B Birm D O M S ophthalmic surgeon Mid Worcestershire group of hospitals
N S P F M B Birm F R C S consultant surgeon Mid Worcestershire group of hospitals
T R N F R C S consultant orthopaedic surgeon West Cornwall clinical area
ON WARD W A M B Brist D T M deputy medical superintendent (S H M O) Horsham Frontier Colony
ON T H M B Manc F R C S M R C O G obstetrician and gynaecologist Burton on Trent and Lichfield Sutton Coldfield and Tamworth group of hospitals
CB ALEXANDER M D Glasg D P M consultant psychiatrist Barrow and Furness Hospitals
S J K M B Brist D A consultant anaesthetist West Cornwall clinical area
LE B R M R C S D A consultant anaesthetist North Gloucestershire clinical area
R RONALD M B Brist D P M physician in psychiatry (S H M O) Bristol Mental Hospital
L G A W M D B S D P H M O H and school M O Barnsley
T I M D Edin D P M deputy medical superintendent (S H M O) Sandhill Park Institution
H D W D S C M B Lond M R C P consultant physician Bath clinical area
EITS A T M M D Lond M R C P consultant chest physician Bristol clinical area
SON T W M B Edin D P H M O H and school M O Dewsbury
JOHN BROOKS W H S M B Camb M R C P consultant physician West Cornwall clinical area
LS C P M B Lond F R C S consultant surgeon Bath clinical area
ONS P N M B Sydney F R C S E M R C O G consultant obstetrician and gynaecologist West Cornwall clinical area
ET R D M B Camb M R C P consultant dermatologist Plymouth clinical area
BUSH HENRY M B Manc D P H M O H Tamworth

Births, Marriages, and Deaths

BIRTHS

IS —On July 7 the wife of Dr H St C C Addis—a son
C —On July 6 the wife of Dr T B S Dick—a daughter
ER —On July 3 the wife of Dr K J Fisher—a daughter
T —On July 11 in London the wife of Dr F D Hart—a son
TER —On July 7 in London the wife of Dr Cecil McIver—a daughter
TITT —On July 6 in London the wife of Sir Arthur Porritt K.C.M.G —a son.

MARRIAGES

—DREW —On July 10 at Portishead John William Box to Margaret Patricia Drew M B
IDY—OWEN —On July 8 at Clitheroe Anthony Denis Caldy M B to Beryl Owen.
EY—STERLING-HILL.—On July 8 at Northwood Middlesex James Frederick Fisher M B to Rosemary Sterling Hill

DEATHS

TT —On July 12 Henry Cuthbert Bazett C B E M C M A D M Oxfd F R C S
E —On July 9 at Frimley Green Surrey Elizabeth Honor Bone M D Lond.
—On July 7 in London Harold Dunmore Lane M C M R C S
T —On July 8 at Parkstone Dorset Raymond Culver Mott M A M B Camb., aged 73
WICK —On July 6 at Tetbury Glos Richard Ernest Sedgwick B A M D Camb
EY —On July 11 James Leonard Octavius Tilley M R C S
ION —On July 6 at Irvine Ayrshire James Wilson M D Glasg D P H

Notes and News

RESEARCH IN EIRE

THE Medical Research Council of Ireland continues to do much with small financial resources Investigation into the chemotherapy of tuberculosis remains its most important undertaking but the report for 1949[1] records a number of other studies of clinical interest The importance of subclinical diabetes in the elderly has been underlined by the observation that of 80 patients aged fifty or over who had no definite symptom of diabetes 22 (27%) had a diabetic type of disturbance of carbohydrate metabolism Under the stress of an operation such patients might develop a severe grade of diabetes and the risk might be increased by postoperative intravenous administration of glucose in large quantities in fact in one Dublin hospital two patients had earlier died within a short time of each other from diabetes recognised only after urinary tract operations The routine now followed with satisfactory results in the urological department of this hospital is to estimate the blood sugar two hours after 50 g of glucose have been administered If the value is over 170 mg per 100 ml then a glucose tolerance test is done

ACUTE YELLOW ATROPHY

At a meeting of the North of England Obstetrical and Gynaecological Society held in Newcastle upon Tyne on June 2 Mr FRANK STARLEY described two cases of recovery from acute yellow atrophy of the liver Both of these he said had been very severe and each patient had been treated with large doses of vitamins given intravenously An intravenous cocktail consisting of physiological saline 1 pint glucose 10% aneurine 50 mg nicotinamide 100 mg and riboflavin 50 mg had been administered Three pints per day of this solution plus one pint of saline had been given and both patients had made dramatic recoveries It was interesting to note that a shrunken liver could increase in size with great rapidity and it was thought that in this condition individual liver cells could shrink and re-expand

STERILISATION OF SYRINGES

In a lucid and readable booklet entitled *The Sterilisation and Care of Hypodermic Syringes* Messrs Hodgson and Walkley describe methods of sterilising different types of syringes and also give hints on cleaning and storage This booklet cannot be said to replace the Medical Research Council's memorandum on the same subject but it puts some of the information in a more convenient form Two statements seem to need revision first that after sterilisation the syringe can be stored by immersion in surgical spirit and that if a trace of spirit is likely to affect the injection medium this can be removed by "a violent shake or two with the nozzle downwards" secondly that the pull on the plunger caused by the vacuum produced when the plunger is pulled back the nozzle being occluded is called the "gravitational pull" The booklet also describes a method of preserving the ceramic used for the graduations by avoiding the use of alkali in the water in which the syringe is to be boiled One feels that it would be more satisfactory to have etched or cut graduation marks Apart from these small points the booklet should prove useful to those who use or maintain hypodermic syringes

UNITED NATIONS PUBLICATIONS

Two useful reference works have lately been published by the United Nations at Lake Success The Annual Report on Child and Youth Welfare[3] though dated 1949 was issued in May of this year and gives as usual a summary of information from governments showing progress in this field all over the world This annual report was originally published by the League of Nations and the task of preparing it was transferred to the United Nations in 1946 The Catalogue of Economic and Social Projects 1950[4] is only the second in a series designed to be submitted from time to time to the Economic and Social Council of the United Nations The economic and social studies and investigations undertaken are described in short notes these mention the form the studies took and give the reference numbers of forms in which the results were published

1 Published from 50 Merrion Square Dublin.
2 Medical Research Council War Memo no 15 H M Stationery Office 1949
3 United Nations Publications 1949 iv 9 H M Stationery Office Pp 207 1s
4 U N Publications 1950 II D 1 H M Stationery Office Pp 515 10s

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This hospital, which is being built in Addis A nearing completion , and the honorary medical are prepared to engage staff It is hoped that hospital will begin this year The hon. secretary Sylvia Pankhurst, 3, Charteris Road, Woodford, E

Blood-donors

Gifts of blood to hospitals in England and Wales the National Blood Transfusion Service totalled during the first three months of this year—the number since the war Over 23,600 more donors jo service in the quarter, bringing the total strength 377,704 Another 220,000 donors are needed to keep of the steadily increasing demands of hospitals and to calls on the individual donor

The Blind in Scotland

There were 8854 registered blind persons in Scotland end of March, compared with 8596 in 1949 and highest recorded figure) in 1939 , and 77% of them were fifty years old Blindness among children continues decrease there were 170 blind children under sixteen, pared with 195 in 1939

American "Mercy-killing" Case

Last March Dr Hermann N Sander, a new Hamp practitioner, was acquitted of a murder charge arising his admission that he had introduced air into the circul of a woman dying of cancer At the trial it was argued the defence that the air had not entered the vein, and at the time of the attempted injection the patient was alre dead (see *Lancet*, March 18, p 524) After the acquittal State Board of Registration suspended Dr Sander s licen to practise , but this licence has now been restored.

International Federation of Physical Medicine

At a meeting recently held in London it was decided constitute the International Federation of Physical Me The objects of this body are (1) to promote on an internat basis the study and practice of physical medicine in widest sense of the term, and (2) to hold international ferences in this subject An interim committee was appo as follows chairman, Dr Frank Krusen (Mayo C U S.A.) , vice chairman, Dr Svend Clemmesen (Copenhag hon secretary, Dr Philippe Bauwens (London), members, Dr W S Tegner (London) and Dr Hugh F (London) The temporary headquarters of the will be in London (c/o the British Association of Ph Medicine 45, Lincoln's Inn Fields, London, W C.2), and first congress will if possible be held in London in July

Mr O F C Bromfield, F C S , has retired, on medical from the editorship of the *Chemist and Druggist* He connected with the journal for over twenty years and editor since 1940

In the final of the Leeds medical golf competition for Moynihan challenge cup, held at Alwoodley Golf Cl July 9, Dr L L Hurwich beat Dr John Douglas 5 (36 holes)

Diary of the Week

JULY 23 29

Thursday, 27th

MEDICO LEGAL SOCIETY Manson House 26 Portland Place 8 P M Dr R Sessions Hodge Hormone Treatment Sexual Offender

Friday, 28th

UNIVERSITY OF BIRMINGHAM
11 A.M (Medical School.) Dr Maurice Krahl (Saint L Hormone Regulation of Glucose Utilisation by Tr (Banting Memorial Lecture)
1 30 P M (General Hospital Birmingham) Short clinical

NEUROSURGICAL TREATMENT OF PERSISTENT PAIN*

J. C. White
M.D. Harvard, F.A.C.S.
Associate Professor of Surgery, Harvard Medical School; Chief of Neurosurgical Service, Massachusetts General Hospital, Boston, U.S.A.

Pain, although not a malady in itself, is a common denominator of many medical and surgical conditions. In trauma or acute disease it often serves a very useful purpose by warning the victim of his danger. In the neuralgias and in many chronic diseases it is often first recognized as becoming a purely destructive factor. In these circumstances if there is persistent pain which cannot be relieved by direct surgical attack on a pathological lesion itself or by ordinary medication short of narcotic drugs, relief can often be obtained only by surgical interruption of sensory pathways. If surgery is withheld the sufferer is frequently doomed to narcotic addiction, psychical deterioration, or even suicide.

The interest shown in developing the technique of relieving this type of pain by surgery varies a good deal at different clinics. In the Massachusetts General Hospital we have had a very stimulating opportunity of treating many forms of severe pain. The patients are referred to us about the time that heavy doses of morphine become necessary, provided it is felt that the patient has more than a month or two to live. The neurosurgeon must learn the possibilities and limitations of surgical control of pain, that ineffective mutilating procedures can only make matters worse and the symptoms more difficult to deal with, and that once the patient has become a narcotic addict even the most skilfully planned and executed operation may not rid him of his complaints.

In the past fifteen years my associates and I have performed over 1100 operations for the relief of otherwise intractable pain of one form or another, and I shall review here the lessons we have learned. This work has been the common effort of many surgeons of the Massachusetts General Hospital staff, and my personal cases make up a relatively small proportion. In a single lecture it is impossible to include all varieties of neuralgia and their relief by neurosurgery, so I shall limit my remarks to the three operations which have interested us most—cordotomy, sympathectomy, and prefrontal leucotomy—and shall discuss their relative merits and demerits.

ANTEROLATERAL CORDOTOMY

Spiller had noted that loss of appreciation of pain and temperature resulted from a lesion in the opposite anterolateral column, and in 1912, at his suggestion, Martin performed the first cordotomy for the relief of pain (Spiller and Martin 1912). Subsequent cordotomies have been made usually in the upper thoracic region, less often in the upper cervical region. Current textbooks of neuroanatomy are responsible for the idea that the depth of a cordotomy incision need be only 3 mm. from the line of the dentate ligament ventrally towards the anterior roots. Such a limited incision rarely produces complete analgesia above the lumbar dermatomes. Electrical stimulation during operations under local anæsthesia has shown that axones subserving pain are scattered widely over the anterolateral quadrant, and the examination of post mortem material has taught us that it is necessary to divide virtually the whole anterolateral quadrant to secure a high level of analgesia (see figure).

We tell the patient what we are trying to achieve and we perform these operations under procaine infiltration supplemented by light thiopentone and nitrous oxide anæsthesia. When the incision in the cord has been made the patient is allowed to wake and the level of analgesia is checked. Often successively deeper incisions are needed to secure a satisfactory high level. All perception of sharpness or disagreeable sensation or repeated pricking with a pin must be lost; a high degree of hypalgesia will not suffice.

A patient had severe pain in his left leg as a result of chronic arachnoiditis of the cauda equina, for which he had undergone removal of a prolapsed intervertebral disc, loss of a fragment of adhesive arachnoid material, and a sympathetic ganglionectomy on the right side. The left leg, the right leg, and the right hemiplegic limb were the only areas in which there was no pain. He was operated on under local anæsthesia, and four successive cordotomy cuts had to be made, the level of the first being at the 3rd thoracic segment, and the last at the level of the 12th thoracic segment. Fortunately it has been maintained at this level and he has been free of pain for two years.

In time the level of analgesia nearly always falls several segments, occasionally to a much greater extent, and hypalgesia is substituted for analgesia. This process may pass unnoticed by him or without careful examination, which demonstrates hypalgesia only if it is taken for analgesia. Even if the patient fails to recognize that single pricks or the scratch of a pin as sharp this does not prove that analgesia is complete; on irritation by rapidly repeated pricks pain is often found where this stimulus evokes a disagreeable response. When this has occurred we have found a second deeper cordotomy effective in two-thirds of the cases. Fall of the sensory level has been most common in the amputation stump neuralgias, particularly in those of the upper extremity, where the spinothalamic tract has been divided at the level of the first cervical segment or in the medulla. On the other hand, as a result of faulty surgical technique the first level of analgesia achieved may be insufficient, and failures and disappointments may result.

It is fortunate that even the most extensive transections of the anterolateral quadrant produce relatively few complications (table I). In our way of thinking, the risks of cordotomy are so slight in comparison to the psychic damage of leucotomy that we favour its trial on one side at least if there is any reasonable chance of success.

Cross-section of spinal cord at level of cordotomy at 2nd thoracic segment (Weigert-Pal × 10). There was hypalgesia to xyphoid and analgesia to umbilicus. Relief of contralateral pelvic and leg pain from carcinoma of colon was complete. There was no bladder complication or leg weakness. The patient died of uræmia from ureteral compression. (This illustration demonstrates that even a very complete transect on of the anterolateral quadrant may at times not result in a high level of analgesia.)

*A Macarthur Postgraduate Lecture in the University of Edinburgh, delivered on May 10, 1950.

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This hospital, which is being built in Addis A[illegible] nearing completion, and the honorary medical [illegible] are prepared to engage staff It is hoped that [illegible] hospital will begin this year The hon. secretary [illegible] Sylvia Pankhurst, 3, Charteris Road, Woodford, E[illegible]

Blood-donors

Gifts of blood to hospitals in England and Wales [illegible] the National Blood Transfusion Service totalled during the first three months of this year—the [illegible] number since the war Over 23,600 more donors [illegible] service in the quarter, bringing the total strength [illegible] 377,704 Another 220,000 donors are needed to keep [illegible] of the steadily increasing demands of hospitals and to [illegible] calls on the individual donor

The Blind in Scotland

There were 8854 registered blind persons in Scotland [illegible] end of March, compared with 8596 in 1949 and [illegible] highest recorded figure) in 1939, and 77% of them were [illegible] fifty years old Blindness among children continues [illegible] decrease, there were 170 blind children under sixteen [illegible] pared with 195 in 1939

American "Mercy-killing" Case

Last March Dr Hermann N Sander, a new York [illegible] practitioner, was acquitted of a murder charge arising [illegible] his admission that he had introduced air into the circulation of a woman dying of cancer At the trial it was argued [illegible] the defence that the air had not entered the vein, and that [illegible] at the time of the attempted injection the patient was already [illegible] dead (see *Lancet*, March 18, p 524) After the acquittal the [illegible] State Board of Registration suspended Dr Sander's [illegible] to practise, but this licence has now been restored

International Federation of Physical Medicine

At a meeting recently held in London it was decided [illegible] constitute the International Federation of Physical Medicine The objects of this body are (1) to promote on an international basis the study and practice of physical medicine in the widest sense of the term, and (2) to hold international conferences in this subject An interim committee was appointed as follows chairman, Dr Frank Krusen (Mayo Clinic U S A), vice chairman, Dr Svend Clemmesen (Copenhagen), hon secretary, Dr Philippe Bauwens (London), [illegible] members, Dr W S Tegner (London) and Dr Hugh [illegible] (London) The temporary headquarters of the federation will be in London (c/o the British Association of Physical Medicine 45, Lincoln's Inn Fields London, W C.2) and the first congress will if possible be held in London in July [illegible]

Mr O F C Bromfield, F C S, has retired, on medical [illegible] from the editorship of the *Chemist and Druggist* He [illegible] connected with the journal for over twenty years and [illegible] editor since 1940

In the final of the Leeds medical golf competition [illegible] Moynihan challenge cup, held at Alwoodley Golf [illegible] July 9, Dr L L Hurwich beat Dr John Douglas [illegible] (36 holes)

Diary of the Week

JULY 23-29

Thursday, 27th

MEDICO LEGAL SOCIETY Manson House 26 Portland Place 8 P.M Dr R Sessions Hodge Hormone Treatment of Sexual Offender

Friday, 28th

UNIVERSITY OF BIRMINGHAM 11 A M (Medical School) Dr Maurice Krahl (Salt Lake City) Hormone Regulation of Glucose Utilisation by Tissues (Banting Memorial Lecture) 1 30 P M (General Hospital Birmingham) Short clinical [illegible]

NEUROSURGICAL TREATMENT OF PERSISTENT PAIN*

J C WHITE
M D Harvard, F A C S
ASSOCIATE PROFESSOR OF SURGERY, HARVARD MEDICAL SCHOOL, CHIEF OF NEUROSURGICAL SERVICE, MASSACHUSETTS GENERAL HOSPITAL, BOSTON, U S A

PAIN, although not a malady in itself, is a common denominator of many medical and surgical conditions, and in trauma or acute disease it often serves a very useful purpose by warning the victim of his danger But in the neuralgias and in many chronic diseases as Milton first recognised, it becomes a purely destructive factor In these circumstances if there is persistent pain which cannot be relieved by direct surgical attack on the pathological lesion itself, or by ordinary medication short of narcotic drugs, relief can often be obtained only by surgical interruption of sensory pathways If surgery is withheld, the sufferer is frequently doomed to narcotic addiction, psychical deterioration, or even suicide

The interest shown in developing the technique of relieving this type of pain by surgery varies a good deal in different clinics In the Massachusetts General Hospital we have had a very stimulating opportunity of treating many forms of severe pain These patients are referred to us about the time that heavy doses of morphine become necessary, provided it is felt that the patient has more than a month or two to live The neurosurgeon must learn the possibilities and limitations of surgical control of pain, that ineffective mutilating procedures can only make matters worse and the symptoms more difficult to deal with, and that once the patient has become a narcotic addict even the most skilfully planned and executed operation may not rid him of his complaints

In the past fifteen years my associates and I have performed over 1100 operations for the relief of otherwise intractable pain of one form or another, and I shall review here the lessons we have learned This work has been the common effort of many surgeons of the Massachusetts General Hospital staff, and my personal cases make up a relatively small proportion In a single lecture it is impossible to include all varieties of neuralgia and their relief by neurosurgery, so I shall limit my remarks to the three operations which have interested us most—cordotomy, sympathectomy, and prefrontal leucotomy—and shall discuss their relative merits and demerits

ANTEROLATERAL CORDOTOMY

Spiller had noted that loss of appreciation of pain and temperature resulted from a lesion in the opposite anterolateral column, and in 1912, at his suggestion, Martin performed the first cordotomy for the relief of pain (Spiller and Martin 1912) Subsequent cordotomies have been made usually in the upper thoracic region, less often in the upper cervical region Current textbooks of neuroanatomy are responsible for the idea that the depth of a cordotomy incision need be only 3 mm, from the line of the dentate ligament ventrally towards the anterior roots Such a limited incision rarely produces complete analgesia above the lumbar dermatomes Electrical stimulation during operations under local anæsthesia has shown that axones subserving pain are scattered widely over the anterolateral quadrant, and the examination of post mortem material has taught us that it is necessary to divide virtually the whole anterolateral quadrant to secure a high level of analgesia (see figure)

We tell the patient what we are trying to achieve and we perform these operations under procaine infiltration, supplemented by light thiopentone and nitrous oxide anæsthesia When the incision in the cord has been made, the patient is allowed to wake and the level of analgesia is checked Often successively deeper incisions are needed to secure a satisfactory high level All perception of sharpness or disagreeable sensation on repeated pricking with a pin must be lost, a high degree of hypalgesia will not suffice

A patient had severe pain in his legs as a result of chronic arachnoiditis of the cauda equina, for this he had undergone removal of an intervertebral disc, lysis of caudal adhesions, and two anterolateral cordotomies on each side under general anæsthesia, at the level of the 4th and 5th thoracic segments Even in the sacral dermatomes analgesia was not complete He was operated on under local anæsthesia, and four successively deeper cuts had to be made, at the level of the 1st thoracic vertebra, before analgesia could be raised to the level of the 12th thoracic segment Fortunately it has remained at this level and he has been free of pain for two years

In time the level of analgesia nearly always falls several segments occasionally to a much greater extent, and hypalgesia is substituted for analgesia This process may pass unnoticed because without careful examination a high degree of hypæsthesia is easily mistaken for analgesia Even if the patient fails to recognise that single pricks or the scratches of a pin are sharp this does not prove that analgesia is complete on facilitation, by rapidly repeated pricks, areas can often be found where this stimulus evokes a disagreeable response When this has occurred, we have found a second deeper cordotomy effective in two thirds of the cases Fall of the sensory level has been most common in the amputation stump neuralgias, particularly in those of the upper extremity where the spinothalamic tract has been divided at the level of the first cervical segment or in the medulla On the other hand, as a result of faulty surgical technique the *initial* level of analgesia achieved may be insufficient and failures and disappointments may result

It is fortunate that even the most extensive transections of the anterolateral quadrant produce relatively few complications (table I) To our way of thinking, the risks of cordotomy are so slight in comparison to the psychic damage of leucotomy that we favour its trial, on one side at least, if there is any reasonable chance of success

Cross-section of spinal cord at level of cordotomy at 2nd thoracic segment (Weigert Pal, × 10) There was hypalgesia to xyphoid and analgesia to umbilicus Relief of contralateral pelvic and leg pain from carcinoma of colon was complete There was no bladder complication or leg weakness The patient died of uræmia from ureteral compression (This illustration demonstrates that even a very complete transection of the anterolateral quadrant may at times not result in a high level of analgesia.)

* A Macarthur Postgraduate Lecture in the University of Edinburgh, delivered on May 10, 1950

TABLE I—COMPLICATIONS OF CORDOTOMY (*a*) THOSE ARISING IN HOSPITAL AFTER 241 CORDOTOMIES ON 210 PATIENTS, (*b*) PERSISTENT COMPLICATIONS IN 20 PATIENTS EXAMINED 5 MONTHS TO 10 YEARS AFTER UNILATERAL CORDOTOMY

Type of cordotomy	No	Incidence of complications in hospital (%)				Deaths (%)
		Bladder	Bowel	Incision pain	Motor weakness	
Unilateral	126	5	2	2	4	2 4
Bilateral one-stage	65	29	5	2	8	7 7
Bilateral two stage	19	16	10	0	10	5 3

Persistent complication	*No of cases*	*Remarks*
Vesical dysfunction	0	
Leg weakness	1	Slight at 20 mos
Ipsilateral decreased abdominal or cremasteric reflexes or increased tendon reflexes or Babinski s sign*	10	
Sexual dysfunction in males temporary absence of erection and orgasm postoperatively	3	Recovery in 5 mos to 2 yr
Root pain at level of incision	1	Stopped after 3 yr
Disagreeable paræsthesias in anal gesic area	7	Severe in 1

* These patients had no troublesome spasticity

The results of cordotomy in malignant and non malignant disease are given in table II, which shows that relief of pain was satisfactory in 73–88% of the abdominal and pelvic malignancies, but was less complete in tumours of the breast, lungs, and bones where high spinal and thoracic metastases are so common The relief in 71% of amputation stump neuralgias and painful conditions associated with disease of the spinal roots is comparable *to that seen in the more favourable varieties of malignant* disease

It is a well-known experience with disease of the thorax, abdomen, or spine that a severe pain on one side may mask a slighter pain on the other In these circumstances, after a unilateral cordotomy the patient soon begins to complain again of new discomfort on the opposite side Among 89 cases of malignant disease of the torso cross over pain occurred early in 31, and after several months in 8 others Pain became troublesome on the opposite side in 14% of patients with non-malignant disease of the torso, but never in those with lesions of the extremities Failure of this sort after unilateral cordotomy is not of serious consequence, because it is easily corrected by an incision on the opposite side Since a bilateral operation is often unnecessary, and because we have found that urinary complications are much less frequent if both anterior quadrants are not transected at a single stage, we prefer to start with a conservative unilateral cordotomy unless pain is severe on both sides

Spinothalamic Tractotomy at Higher Levels—The spinothalamic tract was divided in the medulla oblongata by Schwartz (Schwartz and O'Leary 1941), and in a number of cases we have relieved neuralgia of the shoulder, neck, and pectoral regions by this procedure The first of these remains free from pain after nine years (White 1941)

Spinothalamic tractotomy may also be undertaken in the mesencephalon, as was proposed by Walker (1942) At this level pain and temperature sensations are lost on the opposite side, both over the face and over the body We have not been altogether satisfied with the results, for the operation carries an appreciably higher mortality and may lead to residual disagreeable sensations in the analgesic area

SYMPATHECTOMY

Viscerosensory axones enter the spinal cord with the somatic sensory axones in the posterior roots Their second neurone crosses the spinal cord and ascends in the opposite anterolateral tract The effective stimuli for visceral sensory nerves are dilatation of the viscus (Hurst 1911) and ischæmia of its wall (Sutton and Lueth 1930) These fibres are few in number considering their wide distribution, so that there is no overlapping of innervation whereby a small area is supplied by several fibres (Weddell et al 1948), and in consequence the threshold stimulus is high and the peripheral mechanism for localising the source of pain is poor In these characteristics viscerosensory neurones resemble those subserving deep somatic structures such as ligaments and skeletal muscles (Lewis 1942)

Recent observations during operations under local anæsthesia have shown that direct stimulation of the inflamed appendix is perceived as painful (Kinsella 1948) and Bentley (1948) has shown that compression of a penetrating duodenal ulcer may cause distinct discomfort, which disappears after the splanchnic nerves have been blocked with procaine

On several occasions during operations for hypertension, under nitrous oxide and local anæsthesia, we have allowed the patient to waken and have stimulated a major splanchnic nerve and the lumbar ganglia, this invariably produced deep abdominal pain With the apparatus we employ, the voltage required is the same as that necessary to evoke a similarly intense response from the 12th intercostal nerve, and the latent period is roughly the same Obviously then pain from a viscus can be abolished by dividing its sympathetic supply, either in its vascular pedicle or in the parent splanchnic trunks, by posterior rhizotomy, or by anterolateral cordotomy Clinical experience has shown that interruption of sympathetic nerves is nearly always successful in relieving pain of purely visceral origin (table III)

Angina Pectoris—The results of surgical interruption of the cardiac pain fibres which pass through the upper three or

TABLE II—RESULTS OF CORDOTOMY FOR RELIEF OF PAIN IN MALIGNANT AND NON MALIGNANT DISEASE

Malignant

Site of growth	No of cases	Good relief	Spread to other levels	Inadequate level	Operative deaths
Breast	10	3	3	3	1
Lung	9	5	—	1	3
Gastro intestinal tract	28	24	1	2	1
Urinary tract	9	7	1	—	1
Male genitalia	9	8	1	—	—
Female genitalia	37	27	6	4	—
Bone	15	9	3	1	[illegible]
All malignant cases	117	70 9%	12 8%	9 5%	6[illegible]

Non malignant

Nature of disease	No of cases	Good relief	Failure	Inadequate level	Operative deaths
Stump neuralgia	7	5	2	2	—
Phantom leg	10	8	2	1	—
Phantom arm	4	1	3	2	—
Paraplegia	7	5	2	2	—
Arachnoiditis	7	5	2	1	—
Tabetic crises	7	6	1	1	—
All non malignant cases	42	71 5%	28 5%*	21 4%	0

* In 3 patients 1 with arachnoiditis and 2 with phantom leg cordotomy failed despite apparently satisfactory levels of analgesia.

TABLE III—RESULTS OF NEUROSURGICAL TREATMENT OF PAIN IN INTRACTABLE VISCERAL DISEASE

Nature of visceral disease	Operation	Results			
		Good	Improved	Failure	Death
Angina pectoris	Upper thoracic ganglionectomy	14	—	—	2
	Posterior rhizotomy	1	—	—	—
	Paravertebral alcohol injection	49	16	6	7
Aneurysm of aortic arch	Paravertebral alcohol injection	3	—	—	—
	Posterior rhizotomy (T1–T7)	1	—	—	—
Carcinoma of liver	Paravertebral alcohol injection (T6–T10)	1	—	—	—
Stenosis of common bile-duct	Splanchnicectomy	1	—	—	—
Pancreatic calculi and fibrosis	Splanchnicectomy	2	—	1	—
Posterior duodenal ulcer with severe coronary disease	Paravertebral alcohol injection (T6–T10)	2	—	—	—
Intestinal dyskinesia	Splanchnicectomy	4	—	1	—
Nephralgia	Splanchnicectomy and denervation of renal pelvis	3	—	1	—
Dysmenorrhœa	Presacral neurectomy only	15	3	3	—
	Presacral neurectomy with suspension &c.	72	4	13	—

four thoracic sympathetic ganglia and the corresponding posterior spinal roots have been reviewed elsewhere (White and Bland 1948) Patients have been submitted to surgical procedures only when medical treatment has failed to control frequently recurring bouts of severe pain In these circumstances, effective chemical interruption of the pain pathways has been successful in 49 cases, with reduction of the severity of the attacks to a point where they can be fairly well controlled by nitrites in 16 others There were 6 failures from incomplete block and 7 deaths in hospital, mostly from coronary thrombosis Intercostal neuralgia was a troublesome postoperative complication in 10%, but always subsided within three months All the cases treated by upper thoracic sympathetic ganglionectomy were relieved of pain referred to the precordium and arm on the denervated side The same has been true of posterior root section in our single experience, and in 30 other cases from various clinics in the United States (see White and Bland 1948) The mortality rate in the surgically treated cases has been only slightly higher than in those denervated by chemical block. On this account, and because of the greater certainty of relief, we are treating an increasing proportion by ganglionectomy, or, if the pain is bilateral and the patient a favourable risk for operation, by section of the posterior roots Many of these patients have now been followed for periods of from two to eleven years There have been few recurrences of angina and all the patients have preserved adequate but painless warnings of their attacks

Aneurysms of Aortic Arch—Three cases with severe pain relieved by paravertebral injection of the upper thoracic ganglia with procaine and alcohol were reported by White (1932) In the past year a woman with two aneurysms in the descending arch and upper thoracic portion of the aorta has been freed of very intense pain by cutting the upper seven thoracic posterior roots on the left side in two stages

Liver and Biliary Tract—Carcinomatous metastases to the liver are rarely painful but in a single case with rapid distension of the hepatic capsule from mammary cancer injection of the splanchnic rami resulted in complete relief for the last weeks of life This woman was particularly grateful because she had been unable to tolerate morphine in any form

Pain may also persist after multiple operations on the biliary ducts In cases where there is no other solution pain of this sort may be relieved by right-sided splanchnicectomy (White and Smithwick 1941)

Pancreatic Calculi and Fibrosis—Distension of the pancreatic ducts may produce severe epigastric pain with radiation to the back Mallet-Guy and de Beaulieu (1947) were the first to show that this can be relieved by splanchnicectomy We have had two successful results in patients with inoperable disease of the pancreas and failure in a third after pneumonia and a series of unfortunate postoperative complications

Duodenal Ulcer—Although there is ordinarily no justifiable reason for treating cases of duodenal ulcer by sensory denervation, we have seen 2 patients with severe epigastric pain secondary to penetrating lesions in whom direct surgical intervention was considered inadvisable on account of advanced coronary disease Smithwick (White and Smithwick 1941) was able to relieve their pain by alcohol injection of the right splanchnic rami

Intestinal Dyskinesia—Sarnoff et al (1948) have applied this term to a syndrome consisting of painful bouts of intestinal distension in which no definite obstructive lesion can be found, even at repeated laparotomies In 5 cases temporary relief after passage of flatus followed differential spinal block with procaine in 4 of these the attacks were permanently stopped by splanchnicectomy

Nephralgia—Pain which clinically resembles renal colic and can be reproduced by distension of the kidney pelvis may occur without any definite urological lesion The effectiveness of denervating the renal pedicle has been established by Oldham (1936), and in our hands in 3 cases The case listed as a failure in table III was relieved of his original pain, but has reported pain at a higher level which we have not had an opportunity to investigate

Dysmenorrhœa—Resection of the superior hypogastric plexus (so-called presacral neurectomy) gives relief in a large proportion of cases of idiopathic dysmenorrhœa At the Massachusetts General Hospital, Ingersoll and Meigs (1948) have reported excellent results in 87 cases, improvement in 7, and failure in 16 Resection of the presacral plexus alone is capable of giving almost as good results as when it is combined with supplementary suspension of the uterus, plastic procedures on the tubes and cervix, &c These writers give an interesting analysis of the causes of failure

I want to emphasise that the effectiveness of sympathectomy is limited to pain originating in the heart, aorta, and abdominal viscera It will not relieve pain originating in the œsophagus, bladder, prostate, or cervix uteri, where the majority of afferent fibres run in the vagi or sacral nerves Also, sympathectomy cannot be expected to relieve pain in malignant disease of the viscera, since this does not usually develop until the lesion has burst through the capsule of the organ and invaded structures in the parietal pleura and peritoneum which are supplied by spinal nerves

In addition to its importance in the control of visceral pain, sympathectomy is of great value in the relief of causalgia and the post traumatic dystrophies In these conditions the beneficial result seems to be related to improvement in circulation, and it is doubtful if any pain pathways are interrupted

Causalgia—The relief by sympathectomy of burning hyperesthesia in typical war time cases of causalgia has been most gratifying White et al (1948) summarised the cases reported during the war and added 13 from a United States Naval Hospital All the latter had immediate temporary improvement of their pain after paravertebral procaine block and lasting relief following sympathectomy

Post traumatic Arthritis—In a series of cases of post-traumatic arthritis of the extremities equally striking benefit was obtained These patients had suffered contusion of the joints with actual fractures in 4 cases, and the ensuing painful osteoporosis appeared to be related to local impairment in circulation In 3 of them satisfactory relief was obtained from procaine block alone, repeated on one or more occasions The other 4 ultimately required sympathectomy and were then able to start physiotherapy and active use of their decalcified and atrophied extremities

Amputation Neuralgia—Although we have never been able to influence pain after major amputations, excellent results followed paravertebral block and subsequent sympathectomy in 3 cases of amputated fingers and toes, where the pain was accompanied by vasoconstriction, cyanosis, and hyperhidrosis.

Sympathectomy is a safe and harmless procedure after which the patient notices only a regional vasodilatation and loss of sweating Granted that the cases are selected and tested with care, the results have been most gratifying I realise that this may seem a

TABLE IV—RESULTS OF UNILATERAL LEUCOTOMY FOR PAIN

Cause of pain	Relief			Duration
	Good	Fair	Poor	
Carcinoma of face and neck	3	3	—	2 weeks to 7 mos
Multiple bony metastases	—	1	1*	3 and 15 mos
Thalamic syndrome	—	1*	—	8 mos
Atypical facial neuralgia	—	—	1*	6 mos
Post sympathectomy	—	1	—	—
Arachnoiditis	—	2	—	2 and 8 mos

* These patients at first had good results but after six months their pain returned partially or completely

dogmatic statement, but from personal experience I am sure that I can relieve these types of pain with greater certainty than many of the somatic neuralgias

PREFRONTAL LEUCOTOMY

I hope that I have made clear what specific somatic and visceral denervation can accomplish within the limitations of present day knowledge While failures most often follow errors in surgical technique or incomplete knowledge of anatomy, the selection of patients for operation may also be at fault, so that drug addicts and psychoneurotics have been included To improve his batting average, the neurosurgeon needs the cooperation of the referring practitioner and often of the psychiatrist Operations for relief of pain must be undertaken before the onset of drug addiction The psychiatrist must weed out the cases of compensation neurosis and functional pain

Frontal leucotomy is being too often advocated as a simple solution of the relief of suffering—for example, in tabetic crises, in pelvic carcinoma, and even in causalgia In view of the psychical deterioration which ensues when the frontothalamic connections are cut on both sides, there is no justification for recommending this operation for the relief of conditions that can be taken care of by an adequate cordotomy, rhizotomy, or sympathectomy As I see it, leucotomy is an admission of failure, and it should be undertaken only when other measures are already known to be ineffectual, or after they have been tried unsuccessfully

After bilateral prefrontal leucotomy for pain, it has seemed to us that our patients have been more upset psychically than those operated on for schizophrenia or other psychiatric conditions Le Beau's (1950) preliminary report on bilateral topectomy, which he has carried out in 25 cases for relief of persistent pain, indicates that this operation may cause a much lesser degree of mental deterioration As yet we have had too limited an experience with topectomy to have come to any opinion We have, however, tried two modifications of leucotomy

Bilateral transection limited to the lower quadrants of the frontal lobes has left the patients in a peculiar apathetic state Unilateral extremely complete transection of one frontal lobe, as advocated by Scarff (1949), has given fairly promising results in 11 of 13 trials (table IV) If these patients have remained alive for but a short time, their suffering has been greatly relieved, but in 3 of the 5 who survived for over six months pain has recurred to a troublesome extent In the case with atypical facial neuralgia a secondary leucotomy of the opposite frontal lobe was subsequently carried out, this has resulted in great improvement with minimal psychological deterioration The patient with the thalamic syndrome may likewise require a second leucotomy Contrary to Scarff's observation that there is no demonstrable psychical change after a unilateral operation, Cobb and Bonner (to be published) of our psychiatric staff have often found quite definite changes Fortunately these have been neither lasting nor serious As there is no contra indication to carrying out frontal leucotomies in stages, my colleagues and I favour unilateral complete transection of the frontal white matter in all cases where the operation is done for pain If pain returns or is inadequately relieved, a second section on the opposite side can be carried out later In these circumstances early experience in our hands and reports from other clinics seem to indicate that pain is relieved as effectively and with less psychical deterioration than after the one stage bilateral operation

CONCLUSION

It is obvious that we are still somewhat short of our goal of controlling all varieties of pain by neurosurgical intervention We have as yet no certain method for the specific interruption of the pain pathways in some of the postamputation phantoms, especially in the upper limb, for pain following injuries of the spinal cord (as distinguished from the cauda equina), or for the burning hyperæsthesia of the thalamic syndrome Furthermore, even our most trusted operative procedures may fail cordotomy by late falls in analgesic level, and sympathectomy by regeneration of visceral afferent neurones To solve these particular problems, animal experimentation is of little value, we must rely more on direct observations on the conscious human patient Here only the scientific curiosity and physiological ability of surgeons can advance our knowledge

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PURPURA IN PREGNANCY

WITH SPECIAL REFERENCE TO IDIOPATHIC THROMBOCYTOPENIC PURPURA

H N ROBSON
M B Edin., M.R C.P.E
LECTURER IN MEDICINE IN THE UNIVERSITY OF EDINBURGH

L S P DAVIDSON
B A. Camb, M.D Edin, F.R C P, F R C.P.E, F.R.S.E
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF EDINBURGH

As a complication of pregnancy purpura is rare and regarded as of grave import "Purpura" denotes hæmorrhage from skin and mucosæ due to a bleeding tendency The causes of such a bleeding diathesis are many and may be classified as follows

(1) *Thrombocytopenic purpura*
- (a) Idiopathic thrombocytopenic purpura
- (b) Symptomatic thrombocytopenic purpura
  - Blood diseases—e g leukæmia aplastic anæmia, and pernicious anæmia
  - Toxic agents—e g, heavy metals quinine, ergot, sulphonamides, X rays radium and severe burns
  - Systemic diseases—e g severe infections septicæmia uræmia eclampsia and carcinomatosis
  - Splenic disorders—e g congestive splenomegaly, reticulosis, tuberculosis, kala-azar

(2) *Non-thrombocytopenic purpura*
(a) Associated with vascular defect
Anaphylactic—e g , Schönlein's purpura and Henoch's purpura
Toxic and symptomatic—e g , chemicals and drugs, infections and systemic diseases
Avitaminosis—e g , scurvy
(b) Associated with coagulation defect
Hypoprothrombinæmia and fibrinogenopenia
(c) Hereditary defect
Telangiectasia and " thrombasthenia "

t will therefore readily be appreciated that purpura in regnancy may be due to one of many different causes tushmore (1925) collected from the literature 47 cases nd added 1 of his own These cases included instances f purpura arising from such diverse conditions as heumatic fever, septicæmia, eclampsia, smallpox, and curvy The over-all mortality rate in this heterogeneous ollection was given as 26 maternal deaths out of 44 59 1%), and 27 infant deaths out of 42 (64 3%) Later orkers (deSaussure and Townsend 1935, Polowe 944, Patterson 1946, and Chalmers 1948) have continued o quote Rushmore's figures, and have implied that these nortality rates are applicable to one particular type of purpura in pregnancy—e g , idiopathic thrombocyto penic purpura. In discussing this latter condition as a omplication of pregnancy, Wintrobe (1946) and Whitby and Britton (1946) in their textbooks give mortality-rates based on Rushmore's original figures

The prognosis in any given case of purpura in pregnancy must surely depend to a great extent on the type and cause of the purpura, and we intend here to show that these widely quoted mortality-rates are not universally applicable, and that they certainly do not hold good, for example, when idiopathic thrombocytopenic purpura is associated with pregnancy

Since Rushmore (1925) reviewed 48 cases of purpura in pregnancy, some 47 further examples have been reported. We have studied these 95 cases in an attempt to classify them, if possible, and to determine the particular type of purpura present In addition, a further 4 cases of idiopathic thrombocytopenic purpura ssociated with pregnancy are reported.

IDIOPATHIC THROMBOCYTOPENIC PURPURA AND PREGNANCY

It is generally agreed that, to sustain a diagnosis of hiopathic thrombocytopenic purpura, the following riteria must be fulfilled. There must be no history f exposure to toxic agents, or sensitivity to drugs, and here must be no history or signs of other diseases likely o cause thrombocytopenia The cardinal hæmato- ogical features are thrombocytopenia, prolongation of he bleeding time with a normal clotting time, increased apillary fragility, and normal or increased numbers of negakaryocytes in the bone marrow

Of the 95 cases of purpura in pregnancy which have ow been reported 21 have been identified as examples f idiopathic thrombocytopenic purpura, and these are hown in table I, together with the 4 further examples eported here These 25 reports provide records of 4 pregnancies, in which bleeding was present during the ourse of gestation in 24 instances There were 2 aternal deaths (mortality 5 9%), one as a result of bortion and cerebral hæmorrhage, and the other from ubarachnoid hæmorrhage Among the 32 viable babies here were 2 stillbirths and 6 neonatal deaths (mortality 5 0%) 18 of the babies showed purpura with thrombo- ytopenia at or shortly after birth, and of the 8 deaths infants 4 were apparently due to hæmorrhagic disease As regards parity, the purpura was noted in primi- avidæ in 17 cases, during the second pregnancy 4, in the fourth in 2, and in the sixth in 2 In of the patients adequate clinical and hæmatological data were available to indicate that idiopathic thrombocytopenic purpura had been present before pregnancy In 6 cases no such evidence was available, and the condi tion appeared for the first time during pregnancy Of the remaining 8 patients 7 gave a definite history of previous purpuric episodes, and 1 had noted a tendency to excessive bruising Although no hematological data are available in these 8 cases, it seems likely that idiopathic thrombocytopenic purpura had been present before pregnancy Of those 19 patients known to have the disease, or giving a suggestive previous history, signs were present from the beginning of pregnancy in 7 cases, and in another 6 cases purpura appeared at the fifth month In the 6 cases in which the disease appeared for the first time in pregnancy the time of onset ranged from the third to the eighth month Blood loss at delivery was recorded as normal in 25 cases and excessive in 4 Only 1 of these latter 4 patients received a blood-transfusion shortly before or during labour On the other hand, 9 of the 25 cases with normal blood loss were given blood transfusions near the time of delivery Conservative treatment was adopted in 17 cases, with 2 maternal deaths, both taking place in the early months of pregnancy The remaining 15 mothers were safely delivered at term 2 infants died in this group, one stillborn and showing purpura, and the other on the fourth day without purpura

Splenectomy was done during the course of pregnancy in 2 cases In one (Bernstein et al 1939) the operation was successfully performed at the fifth month, but premature labour ensued two months before term, and the child, which was not purpuric, survived only eight days In the second case (Phythyon and Lartz 1943) splenectomy was done a month before term, successfully as regards the mother, who, however, went into premature labour two days later and was delivered of a stillborn non purpuric child

In 8 women 15 pregnancies occurred at various intervals after splenectomy for idiopathic thrombocytopenic purpura, and in these pregnancies there were no maternal deaths In 7 of these instances the mother had thrombocytopenia and recurrence of purpura during pregnancy, 6 of the infants showed purpura, and 3 of these babies died from hæmorrhagic disease In the other 8 instances the mothers had no purpura during pregnancy, but 3 of their infants were purpuric at birth None of the infants died from bleeding in this group, the single neonatal death being due to atelectasis and prematurity

OTHER TYPES OF PURPURA AND PREGNANCY

The classification given earlier indicates the numerous causes of symptomatic thrombocytopenic purpura and of non thrombocytopenic purpura It should be noted that certain infections, toxic agents, and systemic diseases can produce purpura in which the platelet-count may be either normal or reduced In the best of circumstances, therefore, classification may be difficult Cases of purpura in pregnancy reported since Rushmore's (1925) review which do not satisfy the criteria for a diagnosis of idiopathic thrombocytopenic purpura are shown in table II, with an indication of the probable cause of the purpura To these has been added an illustrative selection of some of the earlier cases included in Rushmore's paper The cases in table II are arranged in the order of the classification of the causes of purpura used here There seems to be little justification for any attempt to draw conclusions about mortality or prognosis in such cases Purpura and thrombocytopenia in these are but incidental manifestations of the underlying disorder, and the outcome in any given case must depend on the nature and the severity of the causal disease Certain points may, however, be noted. The appearance of purpura in the infants of mothers with symptomatic thrombocytopenia is illustrated in the cases

reported by Posner (1937), Leschke and Wittkower (1926), Landolt (1948), Guggisberg (1936), and Goldstein (1947) The failure of splenectomy as a therapeutic measure in conditions in which the spleen is not concerned with the production of thrombocytopenia is shown by the case records of Hottenstein and Klingman (1927) and Boley (1930) On the other hand, the interesting report of Polowe (1944) gives details of successful splenectomy in a case of what might now be termed "secondary hypersplenism"

CASE RECORDS

In recent years 4 examples of idiopathic thrombocytopenic purpura associated with pregnancy have been encountered by us In 2 the disease was proved to have been present before pregnancy, whereas in the other 2 cases a history of a bleeding tendency suggested a pre-existent thrombocytopenic state, although hæmatological data were not available

Case 1 —A 3 para, aged 35, was admitted to hospital on April 11, 1947, as having had an incomplete abortion at the fourteenth week. Previous pregnancies were reported as normal The patient stated that she had always bruised easily, had had occasional epistaxis, and had noted a skin rash once Her periods before pregnancy had been regular but not heavy There was no history of drug taking or exposure to toxic agents At the second month of the present pregnancy there had been a severe epistaxis and slight vaginal bleeding, which had recurred later at the third month and continued until admission

On examination petechiæ were seen on the abdomen and face, the gums were bleeding, and there were ecchymoses

TABLE I—CASES OF IDIOPATHIC THROMBOCYTOPENIC PURPURA AND PREGNANCY

Reference	Mother: Age (years)	Parity	Purpura: Before pregnancy: History of purpura and bruising	Proved I T P	Duration (years)	During pregnancy: Appeared for first time	Month in which signs appeared	Delivery: Transfusion at delivery	Type *	Blood loss	Platelets (thous per c mm)	Outcome	Child: Purpura	Platelets (thous per c mm)	Outcome
Liebling (1926)	22	0	—	—	—	+	5	—	F T.S		20	Recovered	+	40	Recovered
Burnett and Klass (1943)	21	0	—	—	—	+	4	—	F T.S	N	76	,,	—	332	Healthy
Chalmers (1948)	29	1	—	—	—	+	8	+	F T S	N	562		—	346	,
Waltner (1924)	38	1	+	—	13	—	1	—	Prem	+	60		+	90	Recovered
Conti (1933)	31	5	+	+	3	—	4	+			0	Died at 4 mos sub arachnoid hæm	—		Dead fœtus
Siegler (1934)	29	5	+	—	7	—	5	+ (1.m 1)	F T.S	+	80	Recovered	—		Died 4th day unknown cause
Sanford et al (1936)	22	0	+	—	many	—		—	F T.S	N	18	,	+	20	Recovered
Morrison and Samwick (1945)		1	—	—	many			—	F T S	N	40		+	80	,
Patterson (1946)	22	0	+	+	18	—	5	—	F T (F)	+	50		+	18	,
McAlenny and Kristan (1949) (nos 4 and 6)	31	1	+	—	many	—	7	—	F T.S	N			+	48	
	33	2					1	—	F T.S	N		,	+	35	,
Robson (1949) no 1	35	3	+	—	many	—	2	+			15	Died at 3 mos cerebral hæm			Abortion
Troland and Lee (1938)	21	0	—	—	—	+	4	+	F T.S	N	78	Recovered splenectomy 4 mos later	—		Healthy
Limarzi (1944)	17	0	+	—	2	—	1	+	F T S	N	100	Recovered splenectomy 1 mo later	—		Healthy
Robson (1949) no 2	25	0	+	+	2	—	5	+	F T.S	N	10	Recovered splenectomy 1 yr later	—		Healthy
Robson (1949) no 3	20	0	+	—	5	—	3	+	F T.S	N	25	Recovered splenectomy 1 mo later	+	130	Recovered
Bernstein et al (1939)	23	0	—	—	—	+	3	—	Prem	N	147	Recovered splenectomy at 5th mo	—	170	2 mos premature died 8th day no purpura
Phythyon and Lartz (1943)	28	0	—	—	—	+	7	—	Prem	N	168	Recovered, splenectomy at 8th mo	—		1 mo premature stillborn no purpura
Urbanski and Hutner (1942)	25	0	+	+	9	—	1	—	F T.S	N	50	Recovered splenectomy 1 mo later	+		Stillborn, purpura
	27	1					—	—	F T.S	N	75	Recovered	+	24	Recovered
	29	2					—		F T.S	N			—		Healthy
	31	3					—		F T.S	N			—		Healthy
Davidson (1937)	21	0	Splenectomy 10 yrs before		18	—	1	+	F T.S	+	21		+	56	Recovered
Whitney and Barritt (1942)	26	0	Splenectomy 12 yrs before		12	—	1	—	F T S	N	70		+	80	Died 3rd day, purpura
	28	1					1	—	Prem	N	62		+	90	Died 2nd day, purpura
Finn (1944) no 1	17	0	Splenectomy 3 yrs before		10	—	5	+	F T.S	N	32		—		Healthy
Finn (1944) no 2	23	0	Splenectomy 9 yrs before		17	—	8	—	F T.S	N	45		+	120	Died 3rd day, purpura
	26	1					—	—	F T.S	N			+	40	Recovered
Finn (1944) no 3	25	3	Splenectomy 2 yrs before		2	—	—	—	F T.S	N	520		—		Healthy
Talmadge and Berman (1947)	20	0	Splenectomy 3 yrs before		3	—	5	+	F T.S	N	25		+	9	Recovered
	24	1				—	—	+	F T.S	N	64		+	5	,
	25	2				—	5	+	Prem	N	9		+	62	
Robson and Davidson (1950) no 4	35	0	Splenectomy 9 yrs before		9	—	—	—	Cæsar prem	—	365		—		Died 2nd day immature
	37	1					—	—	Cæsar F T	—	300		—		Healthy

* F T.S = full term spontaneous

Cases reported by Adair (1925) Bayer (1931) Tesauro (1932), and deSaussure and Townsend (1935) were probably idiopathic thrombocytopenic purpura but the data given are not adequate The examples recorded by Dinsmore and Dutlinger (1946) and Nordland et al. (1946) have not been traced

TABLE II—CASES OF OTHER TYPES OF PURPURA AND PREGNANCY

Reference	Mother					Child			Remarks
	Age (years)	Parity	Month of pregnancy when signs appeared	Platelets (thous per c.mm.)	Result	Purpura	Platelets (thous per c.mm.)	Result	
ottenstein and Klingman (1927)	30	1	4	40	Died after splenectomy in puerperium	—		Lived	Severe anæmia, leucopenia thrombocytopenia ? blood dyscrasia
eshkin and Miller (1934)	29	2	2	100	Therapeutic abortion				Quinine and ergot idiosyncrasy
osner (1937)	28	0	p p	17	Recovered	+	10	Recovered	Quinine idiosyncrasy
andolt (1948)	25	1	9	70		+			
IcGoogan (1935)	19	0	5			—		Premature stillborn	Arsenical treatment for syphilis
essaro (1932)	26	3	9	28		—		Stillborn	Eclampsia
oley (1930)	24	0	p p	90	Died after splenectomy	—		Lived	Severe toxæmia
IcGoogan (1935)	33	5	8	142	Recovered	—		Stillborn	
oldstein (1947)				Reduced	,	+	63	Recovered	, } Twins
						—	122	Lived	
eschke and Witt kower (1926)	28	6	5	6		—		Recovered	Rheumatic fever at 5th month
ong and Orr (1940)	22	1	p p	44		—		Lived	Puerperal fever ? rheumatic
uggisberg (1936)	28	3	9	4	Recovered after splenectomy and cæsarean	+	4	Recovered	Megakaryocytes scanty History of polyarthritis
srael and Winson (1941)	21	1	6	140	Recovered	—		Premature triplets stillborn	Had thyroidectomy for thyrotoxicosis and nephrectomy for carcinoma
Vignes and Stiassnie (1921)	30	3	1					Lived	Syphilis
Byrne (1869)	30	2	7		Died				? Tuberculosis
Barnes (1869)		2	6			—		Premature died	? Smallpox
Wiener (1887)	24	0	7					Died	Smallpox
Hanot and Luzet (1890)	22	0	9			—		Stillborn	Septicæmia and meningitis
Diehl (1899)	36	6	p p			—		Premature stillborn	Puerperal fever
Polowe (1944)	29	2	5	140	Recovered after splenectomy at 8th month	—		Lived	Splenoma
Rushmore (1925)	29	0	6		Recovered	—		Premature stillborn	Urticaria allergic state
Stone and Bunim (1936)	27	0	p p	Normal	Died	—		Lived	Acute yellow atrophy of liver
Ferroni (1903) no 5	21	2	— 6		Recovered				? Scurvy
Zangemeister (1898)	25	0	4			—		Stillborn	? Scurvy

The cases reported by Palombelli (1932) and Henriet (1933) have not been studied

on the legs. The spleen was impalpable There was no pyrexia No other abnormality was found on clinical examination. The uterus was evacuated shortly after admission, with resultant profuse hæmorrhage

Next day, the blood findings were Hb 40%, red cells 2,400 000 per c.mm. white cells 12,000 per c.mm, platelets 15 000 per c.mm., and blood ascorbic acid 0 28 mg per 100 ml. The bleeding time exceeded 10 min., and the Hess test was strongly positive 2 pints of blood was transfused

On April 13 when the patient appeared to be improving, she suddenly developed headache, lost consciousness, and died that evening

Necropsy showed no evidence of uterine infection or systemic disease other than widespread hæmorrhages in many organs including the brain. The spleen was slightly enlarged, and the bone-marrow was active, with plentiful megakaryocytes

Case 2 —A primigravida aged 25, was admitted to hospital on April 1 1946 at the 36th week of pregnancy, with epistaxis and petechial and ecchymotic skin hæmorrhage There was no family history of bleeding, and the patient had had no illness of note until she had begun to have bronchial asthma at the age of 14 At the age of 23, when she was a member of the A T S she had begun to bruise spontaneously She had been admitted to the Royal Infirmary, Aberdeen, where idiopathic thrombocytopenic purpura had been diagnosed she had continued thereafter to have intermittent bleeding episodes. The present pregnancy had been uneventful for the first six months but from the sixth month there had been frequent epistaxes, petechial rashes and ecchymoses

On examination petechiæ were seen on the abdomen and bruises on the legs There was no clinical evidence of other systemic disease The blood findings were Hb 76% red cells 4 160,000 per c.mm. reticulocytes 3% and platelets 0 000 per c.mm The bleeding time was 20 min and the clotting time 6 min clot retraction was poor and the capillary resistance (negative-pressure method) was less than 200 mm Hg Sternal puncture revealed an active normoblastic marrow with increased numbers of megakaryocytes

The patient was thereafter observed in hospital. The platelet count ranged from 10 000 to 30 000 per c mm, and the bleeding time from 12 to 30 min Epistaxes were frequent Transfusions of blood were given at intervals, and one was given the day before the patient went into labour at term on April 31 She was delivered spontaneously, without excessive blood loss, of a normal male child The child showed no purpura, his platelet-count (indirect method) on the second day was 210,000 per c.mm., and he has since thrived

The mother's puerperium progressed normally until the 14th day when purpura reappeared Thereafter she continued to have intermittent purpuric episodes and menorrhagia until October, 1947, when splenectomy was done in Bristol Royal Infirmary This led to a complete clinical remission up to the end of 1948, when the patient was last seen although the platelet-count had then fallen to 55 000 per c.mm from a postoperative peak of 517,000 per c.mm

Case 3 —A primigravida aged 20, was admitted to hospital on July 18, 1949 seven months pregnant, with petechial rash, epistaxis, and bleeding from the gums She stated that she had always bruised easily and bled excessively from cuts At the age of 15 she had had a profuse vaginal hæmorrhage Her periods normally were regular and the loss moderate At the third month of the present pregnancy she had had epistaxis Three weeks before admission bleeding from the gums had been noted followed shortly by petechial rashes on the skin, and then the epistaxis had recurred. There was no history of having taken drugs or of having been exposed to toxic agents

On examination petechiæ and ecchymoses were seen, the gums were bleeding and there was microscopic hæmaturia Physical examination revealed no other abnormality, and the obstetric findings were those of a normal pregnancy about the 30th week. The blood findings were Hb 69%, red cells 3 960,000 per c.mm, white cells 12,000 per c.mm, and platelets 25 000 per c.mm The bleeding time was 10 min., and the clotting time 5 min. the capillary resistance to negative pressure was less than 200 mm Hg The sternal marrow showed normoblastic erythropoiesis and abundant megakaryocytes

The patient remained in hospital under observation, and the remainder of pregnancy was obstetrically normal but punctuated by episodes of bleeding Transfusions of blood were given at intervals The platelet-count ranged from 30,000 to 80,000 per c mm, and at delivery was 25,000 per c mm Labour began at term and was completed spontaneously on Sept 27, with very slight blood loss Blood was transfused slowly during and after labour The infant was male and weighed 7 lb 10 oz at birth, a few purpuric spots were seen on his body twelve hours after birth, when the platelet count was 130,000 per c mm These spots faded quickly and no further bleeding took place On the second day of his life his Hb was 160% and platelets 85,000 per c mm On the 14th day the platelets had fallen to 30,000 per c mm, but by the 21st day these had risen again to 125,000 per c mm On the 72nd day the platelet-count was 370,000 per c mm The child thrived normally, but was weaned from the breast on the tenth day

The mother began to have abnormal vaginal bleeding on the 5th day of the puerperium, when her platelet-count was 60,000 per c mm, about which level it remained Vaginal bleeding continued, and petechiæ, epistaxis, and bleeding from the gums recurred Since no evidence of remission was forthcoming, splenectomy was done on Nov 3 The response to operation was disappointing because, although clinical remission followed and was maintained for the next five weeks, the platelet-count on discharge from hospital on Dec 8 was still only 60,000 per c mm

This is the second case only of a series of 24 cases of idiopathic thrombocytopenic purpura studied by us in which the response to splenectomy has been so poor

Case 4 —The patient had been admitted to the Royal Infirmary, Aberdeen in 1937, at the age of 26, with a year's history of petechial rashes, ecchymoses, and menorrhagia There was no family history of a bleeding tendency, and the patient's previous history had been uneventful No cause of symptomatic purpura had been found, and idiopathic thrombocytopenic purpura had been diagnosed The blood findings at that time had been Hb 56%, red cells 3,900,000 per c mm, and platelets 20,000 per c mm Splenectomy had been done Since then the patient had been in good health and no further bleeding episodes had occurred. In 1946 the patient had become pregnant for the first time, and developed signs of severe toxæmia at the sixth month Cæsarean section was done five weeks before term The platelet-count at this time had been 365,000 per c mm, the bleeding time 2 min, and the capillary resistance normal The patient had made a good recovery without incident, but the infant had survived only 36 hours Necropsy had shown atelectasis of the lungs but no evidence of hæmorrhagic disease In 1948 the patient again became pregnant, all blood findings still being within normal limits Pregnancy was uneventful, and a normal healthy child was delivered by cæsarean section at term Both mother and child have since remained in good health

DISCUSSION

The fallacy of conclusions based on cases of many different forms of purpura in pregnancy was pointed out by Burnett and Klass (1943), who presented a classification of 22 cases of all types, of which they identified 4 as being idiopathic thrombocytopenic purpura, and added a fifth personal case A group of 5 cases is too small, however, to provide much information By a study of the 25 cases of idiopathic thrombocytopenic purpura shown in table I it is now possible to draw conclusions of some value

It seems unlikely that pregnancy is a factor in the production of idiopathic thrombocytopenic purpura This disease is known to affect mainly females below the age of 30 (Wintrobe et al. 1937) Since this age coincides with the maximal incidence of pregnancy, a study of the age incidence of the two conditions combined is not likely to be informative The disease became manifest for the first time during pregnancy in only 6 of the total of 25 cases, and in these 6 cases the time of onset varied widely from the third to the eighth month These findings, together with the great rarity of the combination of pregnancy and idiopathic thrombocytopenic purpura, suggest that the association is accidental There is no real evidence in the present study to suggest that pregnancy precipitates or aggravates the manifestations of the disease Although 17 of the 25 patients showed signs of the disease during the first pregnancy most of these primigravidæ had had bleeding episodes before, and were known or suspected to have had the disease before pregnancy The maternal mortality in these 25 cases, involving 34 pregnancies, was 2 (8%), which is no greater than the expected mortality of the disease in the non pregnant (Wintrobe et al 1937) The infant mortality was high (25%), but even this figure is much less than that quoted by some workers (deSaussure and Townsend 1935, Chalmers 1948) It is interesting that both maternal deaths took place in the early months of pregnancy and not, as might be expected, at the time of childbirth Indeed, the remarkable fact emerges from this study that delivery can and usually does take place without excessive blood loss. In 25 of the 34 pregnancies the blood loss associated with delivery was recorded as being within normal limits, even though many of these patients were profoundly thrombocytopenic at the time Though blood transfusion may well be a factor in preventing or arresting hæmorrhage at delivery, it must be noted that only 9 of the 25 deliveries in which blood loss was normal were preceded or accompanied by blood transfusion Perhaps this remarkable freedom from hæmorrhage at and shortly after delivery is due to some mechanism similar to the increase in capillary strength which has been shown to develop during and after surgical operations (Robson 1949) In case 2, on the second day of the puerperium, the capillary resistance was very high and the bleeding time short The recrudescence of bleeding later in the puerperium, which is reported in many of the cases, might also support the suggestion that some protective mechanism operates temporarily during labour and delivery

The appearance of thrombocytopenia and purpura in the infant is strikingly illustrated in this series, occurring in 18 out of 32 cases, and was the cause of death in 4 infants The usual course of events in the newborn seems to be the appearance of purpura within a few hours of birth, persisting for some days, and then recovering spontaneously Three examples are well described by Talmadge and Berman (1947) The findings suggest the transmission of some circulating factor from mother to child, and it was because of this possibility that the child of case 3 was taken from the breast on the tenth day On the other hand, Patterson (1946) reports spontaneous recovery in a purpuric child who was breast fed throughout

As regards treatment in cases of pregnancy associated with idiopathic thrombocytopenic purpura, the number of cases allows only tentative conclusions to be drawn In 17 cases treated conservatively there were 2 maternal deaths (11 8%) Of the 15 viable babies 9 showed purpura, and 1 of these purpuric infants was stillborn. Splenectomy for idiopathic thrombocytopenic purpura had been done at various intervals before pregnancy in 8 patients 5 of these had recurrence of purpura and thrombocytopenia, and in the ensuing 9 pregnancies there were no maternal deaths, but 8 of the 9 babies were purpuric, and 3 of them died from hæmorrhage The remaining 3 patients who had undergone splenectomy had no recurrence of purpura, in the 6 pregnancies which followed there were no maternal deaths, only 1 of the 6 babies showed purpura, and none died from hæmorrhagic disease It therefore seems that purpura and death are more likely to occur in babies whose mothers have undergone splenectomy with subsequent recurrence of purpura than in infants whose mothers have either not required splenectomy or have not relapsed after the operation These findings suggest that, when the

adency to thrombocytopenia and hemorrhage is so ong in the mother that splenectomy does not control the infant is subjected to a similar powerful influence, th h corresponding risk of bleeding Only two xamples of splenectomy for idiopathic thrombocyto nic purpura during pregnancy have been found, and both the infant died, although both mothers survived nmediate danger to the mother's life seems to be the ncipal indication for splenectomy during pregnancy

The cases of symptomatic purpura (table II) are too ared to allow any general conclusions to be drawn he table illustrates some of the many possible causes purpura in pregnancy and indicates the necessity for curate classification before drawing conclusions about ny one particular type The occurrence of purpura the infant is interesting and suggests again, perhaps, e transplacental passage of some factor causing rombocytopenia in the child The case reported by olowe (1944) shows that splenectomy can be done in regnancy as late as the eighth month without harm to e child

SUMMARY

Of the 95 cases of purpura in pregnancy that have been ublished, 21 have been identified as examples of idiopathic thrombocytopenic purpura, and 4 further cases of his condition complicating pregnancy are reported

In these 25 cases the maternal mortality was less han 10%, and the infant mortality about 25% Previous onclusions about mortality have been misleading, being based on an unclassified series of cases of purpura of many different types

There is no satisfactory evidence that the association of idiopathic thrombocytopenic purpura and pregnancy s more than accidental, or that pregnancy significantly nfluences the course of the disease

The recorded deaths occurred in the early months of pregnancy

Bleeding at delivery was rarely excessive

Thrombocytopenia and purpura in the infant was frequent but usually transient

These manifestations developed more often, and tended to be more severe, in infants whose mothers had not responded clinically and hæmatologically to splenectomy

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SALICYLATES IN ACUTE OSTEOMYELITIS

P G KONSTAM
F R C S.E
ACTING DIRECTOR,
CASUALTY SERVICE

M J MEYNELL
M D, B Sc Sheff,
M.R C P, D P H
CLINICAL PATHOLOGIST

THE GENERAL HOSPITAL, BIRMINGHAM

ALTHOUGH interest has lately been focused on the effect of salicylic acid and its derivatives on the metabolism of Koch's bacillus, and *p* aminosalicylic acid has been introduced into the therapy of tuberculosis, little has so far been published on the effect of salicylic acid on the pyogenic organisms In the only paper on this subject which we have found, Ivanovics (1942) states that sodium salicylate has a bacteriostatic effect on *Staphylococcus aureus* He describes two mechanisms one is a "specific antiseptic action," and the other a direct toxic action on bacterial protein by a process of denaturation The specific action is inhibited by small amounts of pantothenic acid, and the only salicylic acid derivatives which have this action are acetylsalicylate and salicylic acid phenyl esters

We describe here an unusual effect obtained by the administration of large doses of sodium salicylate or aspirin to patients with acute osteomyelitis who responded poorly to penicillin These cases may be of interest in view of the growing number of penicillin resistant strains of *Staph aureus*

In 1945 a middle aged woman was admitted to hospital with severe burns of trunk and extremities The lesions became infected with *Staph aureus* despite penicillin therapy Subsequently the patient developed a pericardial effusion The house surgeon, considering this to be of rheumatic origin, put the patient on large doses of salicylates The pericarditis cleared rapidly and the burns very quickly healed, the patient making a rapid recovery Since the "rheumatic" origin of the heart lesion seemed unlikely, it was thought that there might have been a synergistic effect of penicillin and salicylate on penicillin resistant staphylococci There happened to be a patient in the ward at the time with severe subacute osteomyelitis of the upper humerus which was not responding to penicillin As soon as he had been given a day's course of sodium salicylate gr 30 three hourly, his temperature fell to normal and his condition improved dramatically

In spring, 1949, the opportunity arose to treat four further cases of proved acute osteomyelitis in the manner described

CASE-RECORDS

Case 1 —A boy aged 13 was admitted to hospital on April 11, 1949, with five days history of throbbing, swollen, and

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aching right knee He was flushed, with temperature 101 4°F, and pulse rate 115 There was much tenderness over both condyles of the femur, the skin was œdematous There was no obvious effusion into the knee joint, and the knee could be flexed to 90° without causing much pain

Acute osteomyelitis of the lower end of the femur was diagnosed, and the patient was given penicillin 100,000 units three hourly By April 13 the tenderness over the femoral condyles had almost disappeared, but pyrexia persisted Sulphadimidine was added to the penicillin without effect on the pyrexia On April 18 calcium aspirin gr 10 four hourly was ordered, and the temperature settled within twenty four hours (fig 1) and remained normal thereafter Convalescence was uneventful

Radiography at the end of the second week of illness showed osteomyelitis of the lower third of femur No pus was obtained for culture

Case 2 —A boy, aged 13, was admitted on May 2, 1949, having a week earlier received a knock against the left knee and leg The upper part of the leg had gradually become swollen and painful The child could neither stand on it nor move it A "sore" had broken out on the right arm two days before admission

He was flushed, wide awake, with temperature 102°F, and pulse rate 110 "Cellulitis" was present over the upper part of the left tibia, which was extremely tender There

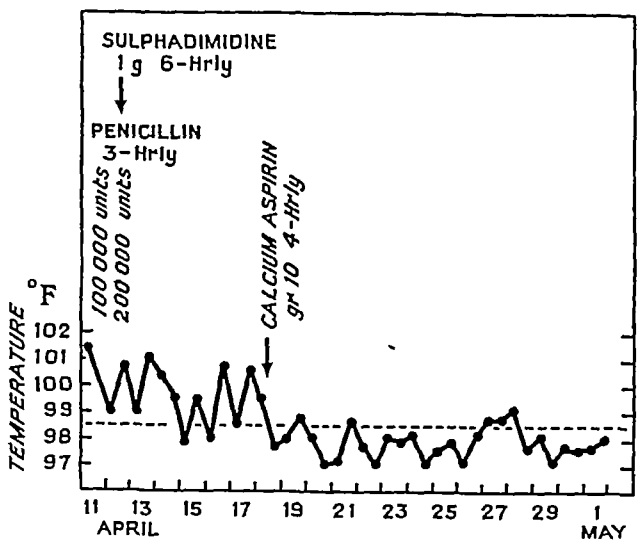

Fig 1—Temperature chart of case 1

was no clinical evidence that the knee joint was involved. There was superficial dirty ulceration over the dorsal border of the right ulna (? metastatic abscess)

The leg was immobilised on a Thomas splint, and penicillin 200,000 units three hourly was given On May 4 fluctuation was present over the subcutaneous border of the tibia, and an extensive subperiosteal abscess was explored and drained Pus was oozing from one point in the bone Here the bone was drilled and a shallow gutter was made The wound was left open and soft paraffin gauze inserted A plaster of paris cast was applied On May 5 the child was put on calcium aspirin gr 10 four hourly The temperature fell to normal within twenty four hours (fig 2), and convalescence was uneventful

A pure growth of coagulase positive *Staph aureus* was obtained which was penicillin resistant on a plate sensitivity test

Case 3 —A girl, aged 15, was admitted on March 9 1949 Nine days earlier she had returned from school complaining of pain in the right thigh When seen by her doctor her temperature was 102°F, and she looked ill and complained of tenderness and pain over the right thigh, just below the inguinal ligament The pain kept her awake at night

Her temperature was 101 4°F, and pulse rate 104 The skin around the right hip joint was hot and tender, and there was swelling about the joint All movements were very painful The joint was aspirated and 5 ml of turbid yellow fluid was withdrawn. The exudate showed masses of pus

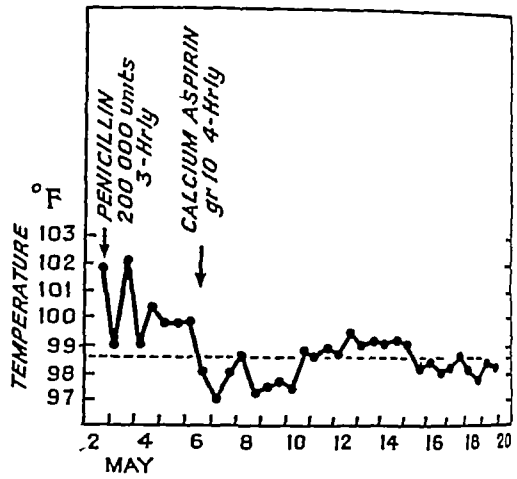

Fig 2—Temperature chart of case 2.

cells No tubercle bacilli were found, and none grew on culture

The limb was immobilised on a Boehler Braun frame with traction Penicillin 100,000 units three hourly and sulphathiazole 2 g immediately and 1 g three-hourly were ordered Pyrexia persisted for twenty one days, so the patient was given calcium aspirin gr 10 four hourly Her pyrexia settled within twenty four hours (fig 3), and clinical improvement continued without interruption

A series of X ray films, showing at first decalcification of the right femoral neck, finally established the diagnosis of osteomyelitis of the upper third of the femur

Case 4 —A man, aged 22, was admitted on April 7, 1949 Six weeks previously he had sprained his left wrist Five weeks later he had felt ill, and shortly afterwards experienced severe throbbing pain at first in the left wrist and later spreading up the left arm Symptoms had increased until admission to hospital.

The temperature was 100°F, and the pulse rate 80 The left forearm, the wrist, and the back of the hand were swollen and tender The main tenderness was over the lower end of the ulna There was some enlarged non tender glands in the axilla

Acute osteomyelitis of the left ulna was diagnosed. An incision over the ulna liberated a large quantity of pus. The periosteum was found raised from the bone, and pus was found underneath it Five holes were drilled into the distal end of the ulna, and pus escaped from them The wound was left open, and a soft-paraffin gauze pack was inserted. The limb was put to rest in plaster slabs Penicillin 200,000 units and sulphadimidine 2 g followed by 1 g four hourly was ordered (fig 4)

The patient's general and local condition was satisfactory and penicillin treatment was continued until April 22, when his temperature began to rise again. On April 25 he presented

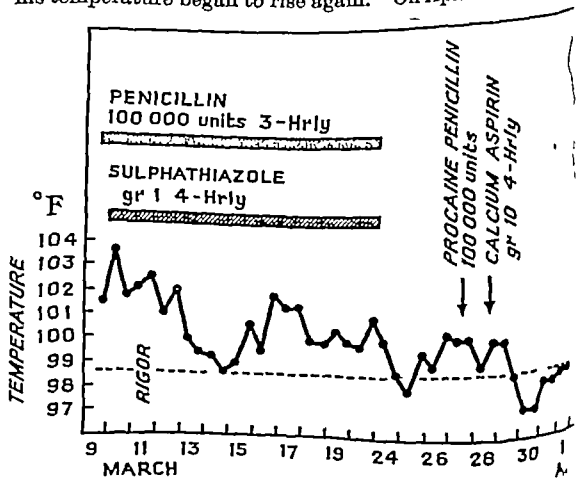

Fig 3—Temperature chart of case 3.

picture of a severe systemic disturbance culminating in vere rigor A blood-culture taken at that time remained ile, but the condition was that of a septicæmia and gave to considerable anxiety On the afternoon of April 25, patient was put on sodium salicylate, gr 30 six hourly April 26 another severe rigor occurred, but next morning temperature was normal and it remained so On April 28 icylism developed, and the administration of salicylate s abandoned The local condition improved thereafter ikingly, and convalescence remained uninterrupted

e pus contained scanty gram positive cocci A culture ed a growth of coagulase positive *Staph aureus* which a penicillin sensitivity of 1 0 Radiography on April 28, ed a slight periosteal reaction in the lower quarter of the , and rarefaction in the base of the ulnar styloid process, condition being consistent with osteomyelitis under ment "

DISCUSSION

ie possibility of a synergistic action of penicillin and vlate was considered, and in an in vitro experiment ling dilutions of penicillin were put up in parallel similar dilutions of penicillin in a solution of sodium ylate containing 40 mg per 100 ml. as the diluent Oxford staphylococcus was used as the test organism agnificant difference was found

ie possibility that large doses of salicylate might directly on the kidneys and prevent the excretion of

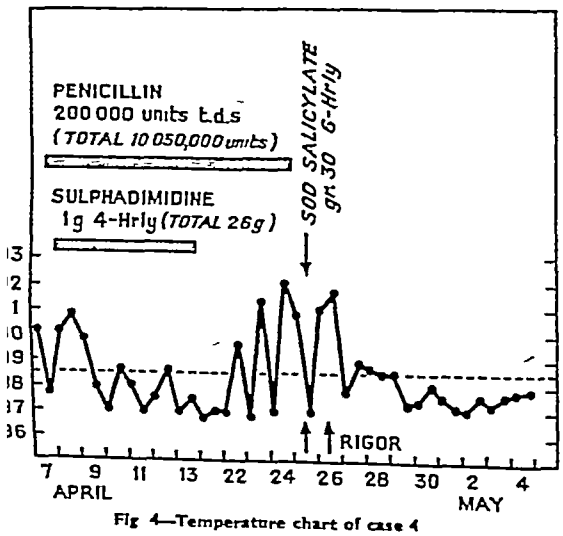

Fig 4—Temperature chart of case 4

ucillin was also investigated Three patients, to whom purpose of the experiment had been explained, were en penicillin 50 000 units intramuscularly, and speci ns of venous blood were collected at half-hour intervals four hours Next day sodium salicylate gr 30 was en four hourly and continued for forty-eight hours er which an intramuscular injection of penicillin 000 units was given. The results were as follows

CASE A

Time	Inhibitory dilution
00 A.M.	Penicillin
30	1/8
00	1/4
30	1/4
00	1/2
30	Nil
30 P.M	Nil
After 48 hours	
odium salicylate	
00 A.M	Penicillin
30	1/8
00	1/8
30	1/8
00	1/4
30	1/4
on	1/2
30 P.M.	Nil
00	Nil

CASE B

Time	Inhibitory dilution
9 00 A.M	Penicillin
9.30	1/8
10 00	1/8
10.30 "	1/8
11 00	1/4
11.30	1/4
Noon	1/2
12.30 P.M	Nil
1.00	Nil
After 48 hours' sodium salicylate	
9 00 A.M	Penicillin
9.30	1/8
10 00	1/8
10.30	1/4
11 00	1/4
11.30	1/2
Noon	1/2
12 30 P.M.	Nil
1.00	Nil

CASE C

Time	Inhibitory dilution
9 00 A.M.	Penicillin
9.30	1/16
10 00	1/8
10.30	1/8
11 00	1/4
11 30	1/2
Noon	1/2
12.30 P.M.	Nil
1 00	Nil
After 48 hours sodium salicylate	
9 00 A.M	Penicillin
9 30	1/8
10 00 "	1/4
10.30	1/4
11 00	1/2
11 30	1/2
Noon	Nil
12 30 P.M	Nil
1 00 "	Nil

Although the result in case A seemed to point to a delayed urinary excretion of penicillin, the results in cases B and C did not It will be seen that the dilutions required were much the same whether salicylates had been given or not

SUMMARY

In four cases of acute osteomyelitis striking clinical improvement followed the administration of large doses of salicylate No explanation is at present offered for this effect

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DIMERCAPROL IN ACUTE LEAD POISONING

POUL BASTRUP-MADSEN
M.D Copenhagen
ASSISTANT PHYSICIAN, ÅRHUS MUNICIPAL HOSPITAL, DENMARK

British anti lewisite, BAL, or dimercaprol (2,3 dimercaptopropanol) has become of great clinical importance in the treatment of intoxications produced by arsenic, gold, and mercury, but it has not yet been thoroughly tested in lead poisoning

Experiments made by Braun et al (1946) to ascertain the efficacy of dimercaprol in the therapy of intoxications by various metallic compounds in rabbits showed that it was an ineffective antidote in lead poisoning On the other hand Chiodi and Sammartins (1947) found in white rats that dimercaprol prevented damage to the kidneys caused by lead compounds, but did not prevent anæmia Ryder et al (1947) found that two hours after a single injection of dimercaprol an increased amount of lead was present in the urine of people who had been exposed to lead during their work Cases of lead poisoning treated with dimercaprol have been reported by Telfer (1947) and Sundlin (1948) In both cases the excretion of lead in the urine was increased without recurrence of the symptoms of intoxication

I report here two cases of acute lead poisoning treated with dimercaprol The lead analyses were done by Prof Hakon Lund, PH.D, of the chemical institute of the University of Århus

Method of Treatment—Dimercaprol was given in the dosage recommended by Carleton et al (1948) four doses of 0 1 mg in the first day, two doses of 0 1 mg from the second to the fourth day, and 0 1 mg on the fifth and sixth days The preparation used was a 5% solution of dimercaprol in arachis oil containing 10% benzyl benzoate

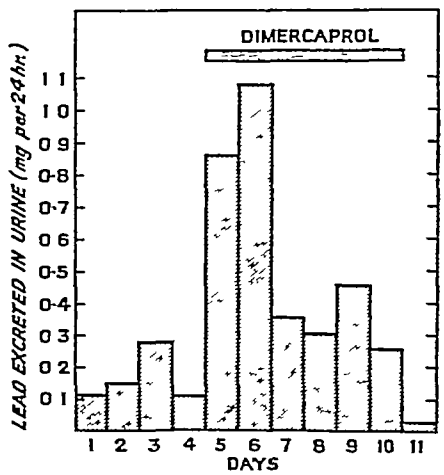

Fig 1—Excretion of lead in case 1

CASE RECORDS

Case 1 —A girl, aged 15 had taken a teaspoonful of litharge (lead monoxide) to induce abortion, and nine days later a second teaspoonful In the next few days she complained of

increasing nausea and headache Four days after the last dose of litharge she developed intermittent diffuse abdominal pain and was admitted to this hospital

On admission the hæmoglobin was 68% (Sicca), 0 2% of stippled cells were found The urine contained porphyrin. The amount of lead excreted in the urine was 0 11–0 14 mg in twenty four hours

Progress —During the first few days in hospital mild abdominal pain persisted, but it was so slight that it did not require treatment The patient felt a little nauseated On the third and fourth days in hospital the patient was given ammonium chloride 6 g daily, but did not respond with a definite increase in the excretion of lead From the fifth day she was given a six day course of injections of dimercaprol, which led at once to a considerable increase in the excretion of lead in the urine (fig 1) The patient suffered no discomfort from the treatment, and the increased excretion of lead was not accompanied by any rise in the number of stippled cells

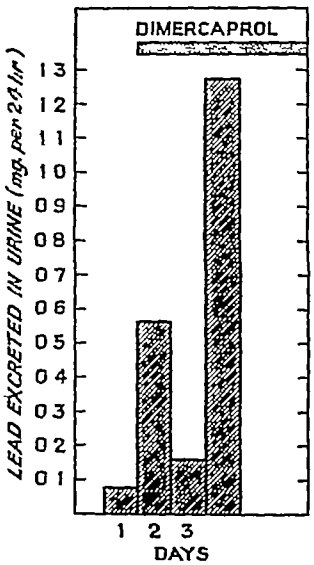

Fig 2—Excretion of lead in case 2 (measured only in the first three days of treatment with dimercaprol)

Follow up —Three months later the patient was well, and the hæmoglobin was 80%

Case 2 —A woman, aged 32, had taken a teaspoonful of litharge to cause abortion. During the next twenty four hours severe abdominal colic developed, and she was admitted to this hospital

On admission she had intense pain, was delirious, and had hallucinations She was pale, with cyanotic lips Her abdomen was tender but soft, palpation showed contracted intestines Her blood pressure was 140/160, pulse rate 60, and hæmoglobin 78% (Sicca) Her urine contained porphyrin There was slight hæmaturia but no albuminuria An eight-hour specimen of urine contained less than 0 05 mg of lead, the amount excreted in twenty four hours was therefore reckoned to be less than 0 15 mg

Treatment and Progress —Dimercaprol therapy as previously described was then instituted The excretion of lead in the following three twenty four hour periods was examined, and a definite increase was found (fig 2) At the start of the dimercaprol therapy the patient was lucid and oriented but complained of severe abdominal pain, which persisted for the next four days It seemed as if the injections of dimercaprol neither aggravated nor mitigated the pain Nor did calcium injections, nitroglycerin, or atropine affect the pain. Injections of morphine gave some relief By the fifth day the pain had disappeared, and the patient felt quite well At the end of the course of dimercaprol there was no hæmaturia, no albuminuria, and no porphyrinuria, but the hæmoglobin was still reduced (67%)

DISCUSSION

The diagnosis of acute lead poisoning was established in these two cases Both patients had taken litharge by mouth and showed typical symptoms of plumbism In case 1 a two day treatment with ammonium chloride did not affect the elimination of lead In both cases a considerable increase in the excretion of lead was seen immediately after the administration of dimercaprol, hence it can scarcely be doubted that the dimercaprol had promoted the excretion The symptoms of intoxication were not aggravated by the treatment, as was the case in the treatment formerly used in mobilising the lead from the body There is scarcely any reason to fear that in mobilising lead from the depots (in the bones or elsewhere) dimercaprol might exacerbate the toxic symptoms, for dimercaprol forms with the heavy metals and arsenic non toxic and very stable compounds, which are quickly excreted (Peters et al 1945)

Therefore it seems reasonable to prefer dimercaprol to lead mobilising therapy with acidosis or parathyroid hormone, since the latter methods of treatment involve a risk of exacerbating the intoxication and are thus contra indicated in the early stages of lead poisoning. Further, in mobilisation of lead by means of acidosis or parathyroid hormone the patient is exposed to the risk of protracted hypercalcæmia, which may very well have unfortunate consequences Dimercaprol must be regarded as a rational and effective means of increasing the excretion of lead in acute lead poisoning

Case 2 had very severe abdominal colic on admission The attacks did not seem to be affected by the injection of dimercaprol. Thus, in severe lead intoxication, the individual intramuscular injections of dimercaprol will not detoxicate such large amounts of lead that the abdominal pain is relieved by each single injection.

It is necessary to investigate a large series of patients to determine whether dimercaprol therapy in promoting the excretion of lead can also shorten the duration of symptoms of plumbism

SUMMARY

Two patients with acute lead poisoning following ingestion of litharge were treated with dimercaprol. In both cases the amount of lead excreted in the urine was considerably increased immediately after the institution of dimercaprol therapy The mobilisation of lead did not seem to aggravate the symptoms of intoxication.

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FATAL SALMONELLA INFECTION SIMULATING ENTERIC FEVER

SARAH CHARD
M B Wales
HOUSE SURGEON

DAVID STERN
M.R C.S
PATHOLOGIST

ST WOOLOS HOSPITAL, NEWPORT, MON

Salmonella tennessee was first isolated in the laboratories of the Tennessee Department of Health from the fæces of a normal carrier employed as a food handler, several people were affected with food poisoning, but no deaths were reported (Bruner and Edwards 1942) *S tennessee* was also responsible for an outbreak of food poisoning in a military hospital in this country in 1947, about 50 people were affected, the disease was mild, giving rise to abdominal pain, cramps, and nausea, with vomiting in a

Small intestine showing transverse ulcers with perforations (indicated by white lines)

of the more severe cases, headache, and diarrhœa, no deaths were reported (Taylor 1947)

CASE RECORD

woman, aged 25, was admitted to this hospital on Oct 16, 9 with a history of abdominal pain and constipation for nty four hours and vaginal bleeding for five days The normal period had been in August There had been essive bleeding in September, and vaginal bleeding had ted two weeks before admission and had continued ermittently since

On examination the patient was very pale and lay on her side Temperature 98°F, pulse rate 120, blood pressure)/72 The abdomen was rigid and tender, especially on left side There was much tenderness in the left fornix vaginal examination The size of the uterus could not be essed, owing to the abdominal rigidity The hæmoglobin s 54% A ruptured ectopic pregnancy was diagnosed

Operation—On laparotomy a left sided ruptured tubal station was found The left fallopian tube and ovary were noved, together with numerous intraperitoneal blood clots e abdomen was closed without drainage One pint of blood s given, and a course of systemic penicillin started

Progress—For the first three days there was practically no ange The general picture was that of an anæmic woman, poor general health, progressing slowly after a severe intra bdominal catastrophe On the fourth day she complained of omiting diarrhœa, and upper abdominal pain She was pathetic and had much abdominal tenderness and distension eristalsis was heard Acute enteritis was diagnosed The ondition deteriorated steadily from this time, and the atient died on the tenth day From the day of the operation ill she died there was persistent pyrexia the temperature uctuating between 101° and 103°F At no time did the atient develop a rash and no enlarged spleen could be elt, but otherwise the clinical picture resembled that of enteric ever Fæces examined at the start of the diarrhœa yielded salmonella on culture This organism was referred to Dr Joan Taylor, of the Salmonella Reference Laboratory, and was subsequently identified as *S tennessee* Blood cultures were sterile

Necropsy—Numerous transverse ulcers associated with perforations of the small intestine were found (see figure) There was a massive fæcal peritoneal effusion Cultures taken rom the ulcers and mesenteric glands yielded *S tennessee*

No other case developed in the ward, and no attacks of mild diarrhœa were noted Thorough investigation of the patient's home contacts did not reveal a carrier So far as could be ascertained, the patient had not eaten any dried eggs

DISCUSSION

In this first recorded death due to *S tennessee* the morbid anatomical appearances were those of true enteric fever It is presumed that a normally mild disease was fatal owing to the lowered resistance of a patient seriously ill from a ruptured ectopic gestation Possibly, however, increased virulence of the organism played a part

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" What remedy, then can be found for the physical and psychological debacle of the twentieth century? The er is provided by the word leisure, yet extremes are difficult to avoid and dangerous when they develop Today the brain worker is starved of leisure that time for unhurried thought, which is his life blood, while the manual operative is surfeited with time which he has not learned to employ to his own best advantage or to that of the society of which he is a unit The former cannot produce what he would wish while the latter, like the Romans of old, is forced to demand more and more spectacles or distractions Both mental and manual worker, the one through denial of opportunity the other through lack of education, may with justice echo the lament of the dying Cecil Rhodes So much to do so little done —Dr A. P MURPHY in presidential address to Australian Medical Congress *Med J Aust* July 15, 1950, p 69

New Inventions

A MODIFIED MAYO VEIN STRIPPER

MODERN opinion is not in favour of injections for idiopathic varices affecting the long saphenous system in the thigh As scarification of the intima of the long saphenous vein has led in my practice to embolic phenomena, Mayo's vein stripper has been modified, a circular blade being substituted for the ring to obtain a clean division of the communicating veins Fig 1

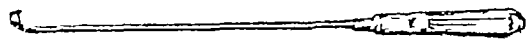

Fig 1—Modified Mayo s vein stripper

shows the modified instrument The shaft has been lengthened and the place of the smooth terminal ring taken by a circular blade 1 cm in diameter

The operation begins with the modern Trendelenburg procedure A no 4 or no 6 œsophageal gum-elastic bougie is next passed down the lumen of the long saphenous vein as far as the knee, a small transverse incision is made at this level, and the long saphenous vein is brought to the surface and divided, the lower end being tied The upper end is brought out of the wound, and the bougie is pulled through the vein to the surface, the modified vein stripper is next passed over the bougie and vein, and the vein is fixed to the bougie with style forceps The vein stripper, guided by the

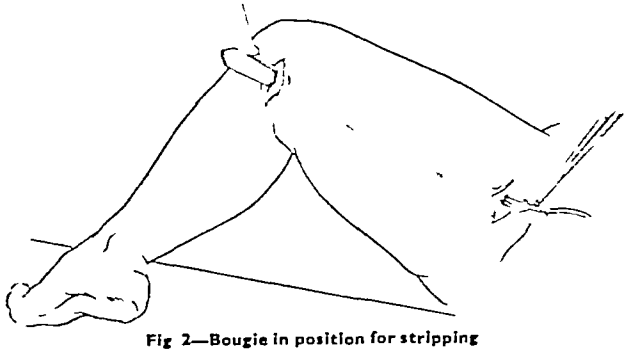

Fig 2—Bougie in position for stripping

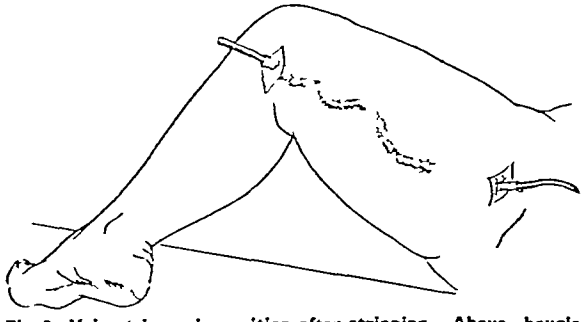

Fig 3—Vein stripper in position after stripping Above bougie removed with stripped vein

bougie, is next pushed up the thigh, and the long saphenous vein is completely removed from knee to groin Figs 2 and 3 show this manœuvre, and fig 3 the excised varicose vein with clean division of the tributaries and deep communications

It is important to operate with the patient in a 20° Trendelenburg position and to maintain the tilt of the table for half an hour after operation to minimise subcutaneous oozing

The instrument has been made for me by Down Bros and Mayer & Phelps Ltd, and I wish to thank Dr K. B Pinson, of the Manchester Royal Infirmary, who kindly made the original model for me

WALTER THOMPSON
M.B Leeds F.R.C.S
Consultant Surgeon South Cheshire Group

Reviews of Books

Malignant Disease and its Treatment by Radium

Vol III (2nd ed) Sir STANFORD CADE, K.B.E., C.B., F.R.C.S., surgeon, Westminster Hospital, consulting surgeon Mount Vernon Hospital and Radium Institute Bristol John Wright & Sons 1950 Pp 446 52s 6d

IN its new edition the third volume of this great work is again welcome for the wealth of clinical experience which the author has at his disposal The chapter on cancer of the breast maintains the high level of the first edition but adds new material on methods of irradiation Thoracic tumours are again dealt with by C Price Thomas he includes new chapters on X-ray therapy, but little description of the methods of irradiation nowadays used for cancer of the lung There is a good clinical section on cancer of the stomach and œsophagus, but these are conditions in which radiotherapy plays little part in treatment The chapter on cancer of the uterus has been extensively revised with the help of M Lederman and now gives important facts about the doses received from different intracavitary arrangements of radium, the combination of X rays with radium, and the methods used for measuring dosage-rate when working with small ionisation chambers loaded in a special probe The other gynæcological cancers are adequately covered, but the chapter on tumours of the ovary might well be extended to describe some of the more recent methods of treatment and their results Improvement in methods of treatment of cancer of the bladder are discussed, but the figures given are out of date, and do not reflect the advances achieved by the use of radium in suitable cases On the other hand, in the section on treatment of cancer of the rectum, a good deal of space is allowed to some radiotherapeutic measures which have been completely discarded

The volume as a whole takes a worthy place with the rest of this standard textbook

Stomach Disease as Diagnosed by Gastroscopy

EDDY D PALMER, M.S., M.D., major, Medical Corps, United States Army London Henry Kimpton 1949 Pp 200 42s

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H L MARRIOTT, O.B.E., M.D., F.R.C.P., physician to Middlesex Hospital, London Oxford Blackwell Scientific Publications 1950 Pp 80 15s

THIS reprint of Dr Marriott's 1946 Croonian lectures is most welcome It forms an excellent introduction to the subject of water and salt depletion and gives a fair survey of the literature up to (though unfortunately not later than) 1946 In the author's words, "water and salt are perhaps practically the most important substances it is in our power to administer", and his book tells, in simple language, why and when they should be administered

The signs and symptoms of water deficiency are well known and nearly always recognised, but the type of dehydration due to salt deficiency can develop just as easily, even in a non tropical country Dr Marriott shows how injudicious treatment may first give rise to and then aggravate salt deficiency dehydration Impending salt deficiency is reflected first by a fall in the urinary chloride excretion a patient suffering from salt-deficiency dehydration may have a normal or near-normal concentration of chloride in his plasma, but his urine may be chloride free Hence the importance of the routine performance of simple approximately quantitative tests for urinary chloride, such as the Fantest Most doctors with tropical experience have seen patients suffering from a combined salt and water deficiency, unable to retain fluids by mouth, or, when at all, failing to get relief from oral administration of salt Dr Marriott suggests that in salt depletion there is pylorospasm, gastric retention, and subsequent vomiting, thus a vicious circle is set up which accentuates the salt deficiency—a suggestion which merits careful and serious consideration

Turning to details, it is somewhat surprising to find no mention of the work of Elkinton and Winkler, and the role of the adrenal cortex is referred to only very briefly The copper sulphate method of determining blood and plasma specific gravities is described a little misleadingly as a "falling drop" method, while the Lindestrom Lang gradient for the same determination is not mentioned

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THE LANCET

LONDON SATURDAY, JULY 29, 1950

The Aseptic Management of Burns

To LISTER's opponents antisepsis, and later asepsis, re anathema not because they were nonsense ough that was the war cry) but most probably cause they looked like being an intolerable nuisance epsis in the operating-theatre is still a nuisance still means endless preparation, constant vigilance, d unswerving attention to detail on the part of sters, nurses, surgeons, assistants, anæsthetists, udents—everyone in fact who comes near the tient Experience has shown the nuisance to be t only tolerable but essential, and nowadays yone who flouted the rules would be roundly and ghtly condemned by his fellow professionals Here, en, is an example of the good habit triumphant troublesome purposeful ritual endured for, and holly justified by, its results

This lesson took time to learn, but once learnt it as universally applied, and now Dr LEONARD OLEBROOK[1] tells us it is time—and high time too—at we learned it afresh, and applied it to the treat ent of burns His argument is extremely cogent t present the almost universal plan is to admit urned patients to a general hospital The surgeons o not want them in the ordinary surgical wards ecause more often than not they become infected nd are a danger to clean cases To admit them to the eptic wards is to invite infection of the burns and mbrace defeat at the outset Some hospitals admit hem to a separate ward of their own, but without laborate precautions against cross infection from case o case, and without specially experienced staff able o give much time to them, this too is unsatisfactory Streptococcal infection is apt to become the rule in uch wards, and the surgeon is then greatly handi capped in his treatment The badly burned or calded patient is a serious emergency, in as much langer of death from mismanagement as a patient with cute appendicitis Such a case, Dr COLEBROOK says, hould be the direct responsibility of a trained surgical eam alive to both the difficulty and the necessity of preventing infection He holds, and we agree with im, that if burned people are to get the treatment which gives them the best hope, first of life and then of functional recovery, we must set up one or more burns centres, preferably attached to hospitals, in very large city He bases his confidence in this plan on his experience as director of the Medical Research Council burns unit of the Birmingham Accident Hospital, from which he retired in 1948 And he compares the lot of a burned patient sent to such a centre with that of one sent to a general hospital The two pictures, drawn sparingly and with detachment, are worth considering carefully

The staff at the burns unit start with the knowledge that, despite the difficulties, infection can be prevented in the great majority of burns and scalds The patient—usually a child, and usually a girl—is seen in the casualty department within 10 minutes of her arrival, either by the senior surgeon of the burns centre or his deputy, who notes in a quick glance the extent of the injury The burned areas are then covered with a large sterile towel and lightly bandaged, and the child is sent immediately to the "shock room," the air of which has been filtered and warmed, and brought in under slight pressure from the roof, so as to limit the chances of airborne infection Since shock develops quickly with any extensive burn, she is at once given a plasma drip through a cannula, so within half an hour of admission she has already had several ounces of plasma into a vein and is getting sips of fluid by mouth A sample of blood, taken before the drip started, yields a hæmocrit estimation within half an hour, and further estimations are made every 2 or 3 hours to guide the surgeon in deciding how fast to give the plasma and when to stop it He visits her at short intervals during those hours, and a special nurse remains with her to comfort her and give her frequent sips of fluid, as well as to look after the drip and watch her condition

When she is fit—usually after 4–6 hours—her burns are dressed quickly in the shock room by a trained team, all completely covered by sterile clothing and using a strict no touch technique If the burn is likely to weep a sheet of 'Cellophane' or special 'Nylon' is included in the dressing to prevent organisms growing through from the outside, and if the dressing might skid, or be moved by the child, a plaster-of-paris shell is put round the outside The treatment which Dr COLEBROOK regards as most successful in keeping a burn free from infection is gentle cleansing with a detergent solution, and a bland non toxic application incorporating penicillin

At the end of 24–36 hours, if the child continues to improve she is moved into a single-bed cubicle, with cross ventilation, opening on a balcony She now has a good chance of avoiding cross infection, and unless the dressings become fouled with excreta they are not changed for a week or more, during which time the child should be nearly, or quite, afebrile and fairly comfortable The next dressing is done by the surgeon, in whom she now has confidence, and it causes little pain because the tissues are not inflamed If bacteriological examination at the second and third dressings shows the wounds to be free from streptococci, skin grafting is done 15–20 days after the accident, and with an experienced surgeon 90% of the grafts take Dressings then become almost painless and healing is complete within 6–8 weeks of the accident Any slight contractures which may develop can be dealt with early

So much for the routine at a good burns unit What usually happens, however, is that the child is admitted to a general hospital which gets only a few bad burns in the year, and makes no special provision for them

She is seen in the casualty department, commonly by a junior surgical officer who telephones the house-surgeon and sends her into a ward This may take 15 minutes The surgeon under whose care she is admitted may not be in the hospital or may be operating, and the house surgeon may be detained by other work—which he may wrongly believe to be more urgent—and may not see her for an hour He often has had no experience of a severe burn, and does not realise that the child's life depends on the immediate treatment of shock by fluid replacement He dresses her burns in the open ward, often without using a strict no touch technique He rarely has enough crêpe bandages for his needs, and so uses cotton ones which will work loose Her condition now being poor, he decides to set up a plasma transfusion, but has difficulty because all the veins are collapsed An hour or two may be wasted in getting the cannula into the vein and establishing a steady flow Since it is now

[1] A New Approach to the Treatment of Burns and Scalds London Fine Technical Publications. 1950 Pp 174 12s 6d

Reviews of Books

Malignant Disease and its Treatment by Radium

Vol III (2nd ed) Sir STANFORD CADE, K.B.E., C.B., F.R.C.S., surgeon, Westminster Hospital, consulting surgeon Mount Vernon Hospital and Radium Institute Bristol John Wright & Sons 1950 Pp 446 52s 6d

IN its new edition the third volume of this great work is again welcome for the wealth of clinical experience which the author has at his disposal The chapter on cancer of the breast maintains the high level of the first edition but adds new material on methods of irradiation Thoracic tumours are again dealt with by C Price Thomas, he includes new chapters on X-ray therapy, but little description of the methods of irradiation nowadays used for cancer of the lung There is a good clinical section on cancer of the stomach and œsophagus, but these are conditions in which radiotherapy plays little part in treatment The chapter on cancer of the uterus has been extensively revised with the help of M Lederman and now gives important facts about the doses received from different intracavitary arrangements of radium, the combination of X rays with radium, and the methods used for measuring dosage rate when working with small ionisation chambers loaded in a special probe The other gynæcological cancers are adequately covered, but the chapter on tumours of the ovary might well be extended to describe some of the more recent methods of treatment and their results Improvement in methods of treatment of cancer of the bladder are discussed, but the figures given are out of date, and do not reflect the advances achieved by the use of radium in suitable cases On the other hand, in the section on treatment of cancer of the rectum, a good deal of space is allowed to some radiotherapeutic measures which have been completely discarded

The volume as a whole takes a worthy place with the rest of this standard textbook

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he cause of the anæmia in these cases is bleeding
i the herniated portion of the stomach Occasion
there is a traumatic ulcer—2 of the 20 cases
orted by SCHWARTZ and BLUMENTHAL [5] had one—
BOCK and his colleagues [6] showed that the
ding is usually a sort of gastrostasis, arising from
ple congestion of the mucosa with enlarged veins
he underlying wall, and subsequent investigations
e confirmed their opinion A considerable pro
tion of the patients with diaphragmatic hernia
n in hospital have had a serious amount of bleeding
as COWAN [7] in New York reported 45 cases of
phragmatic hernia of which 13 had a severe
ondary anæmia He remarked that in the anæmic
nents " the presenting symptoms are those
ually associated with severe anæmias, such as
akness, anorexia, dyspnœa, and pallor Very few
any gastric symptoms are associated with the
æmia The case histories of all these patients show
e presence of a long standing secondary anæmia
th evidence of bleeding from the alimentary tract
t *due* to ulcers, varices, or any other organic disease "
as acute observation shows why the association of
æmia with hernia of the stomach is so often missed—
until radiology provides the answer This combina-
on has been seen in children Thus CHRISTIANSEN [8]
eported a case of hæmatemesis and hiatus hernia in
child of 1 year, and BERGENFELDT [9] noted the same
yndrome in a boy of 18 months who was successfully
reated by repair of the hernia But most of
he patients are elderly and female for example,
BOUSSER [10] in France reported 6 cases, all in females,
aged 41–72 years, and of the 20 cases reported by
SCHWARTZ and BLUMENTHAL 12 were in females and
only 1 woman and 2 men were under 50 The
hæmoglobin in these 20 American cases was very low,
ranging from 2 2 to 7 3 g, and 11 cases had less than
5 g per 100 ml The colour index was 0 70 or less
in 16 patients, the other 4 had had recent acute
hæmorrhages Only 2 had had hæmatemesis, 2 had
fresh blood in the stools, 2 had tarry stools, and only
4 others had a positive occult-blood test in the stools
Twelve of the patients had symptoms referred to the
abdomen, but these were not severe, in fact, cardio-
vascular symptoms were much more prominent

The treatment, ideally, would be surgical repair of
he hernia and return of the herniated stomach to
the abdominal side of the diaphragmatic division
This has been done successfully in the younger cases
But in the patients over 60 the advisability of opera-
ion is doubtful. Fortunately, as SCHWARTZ and
BLUMENTHAL show, nearly all the patients respond
well to iron, in only one of their patients, a woman of
77, was the improvement in the anæmia slow, and this
was because of continued gastro intestinal hæmor-
hage, in the others the response was often dramatic
Evidently the drain on iron stores is slow and there is
no absorption defect to interfere with treatment
Even those who do not respond well to iron by mouth
are likely to improve with the new intravenous
preparations

5 Schwartz S O Blumenthal S A *Amer J Med* 1949 7 501
6 Bock A V Dulin J W Brooke P A *New Engl J Med* 1933 209 615
7 Cowan I I *Amer J Roentgenol* 1937 37 333
8 Christiansen H A *Acta radiol* 1937 18 77
9 Bergenfeldt, E *Acta chir scand* 1940 83 519
0 Bousser J *Bull méd Paris* 1949 63 515

Annotations

UNIFORM ACCOUNTS FOR HOSPITALS

THE Ministry of Health is now requiring all hospitals to adopt a uniform system of hospital accounting [1] This is described as a "relatively simple subjective analysis of expenditure" and it is explained that a more advanced costing technique may need to be developed later to provide data required in respect of "the large multi purpose general hospital, where the costs of the various departments are of major importance in effecting comparisons with other hospitals" In other words, the present proposals are a refinement of the traditional system, and departmental costing will have to await the pilot inquiry now being undertaken by King Edward s Hospital Fund for London and the Nuffield Provincial Hospitals Trust

An attempt is, however, being made to improve the old system The analysis under headings of the traditional type—dressings, drugs and provisions, salaries and wages (medical, nursing, &c)—has been pressed further, and many categories hitherto grouped together have been separated out to facilitate comparison between different hospitals Thus, for example, salaries and wages are now to be split into some ten separate headings so that such an item as catering staff is taken as a unit and includes catering officers, dietitians, chefs, cooks, and kitchen staffs Two further steps are to be taken First an attempt is made to arrive at an assessment of the expenditure on outpatients in order that this disturbing factor may be eliminated 'It is appreciated," it is said "that true outpatient costs can only be ascertained by detailed departmental cost accounting," but a notional elimination of these costs is to be sought by adopting the former E M S basis of five outpatient attendances equalling one inpatient day This is an old trouble Fifty and more years ago Sir Henry Burdett used to try to persuade hospitals to keep accurate figures for outpatient expenditure, but had to fall back on a formula —"that the cost of treating 1000 outpatients is about equal to the expenditure on one occupied bed" By 1905 this was regarded as five times too many The figure now adopted by the Minister is just about as arbitrary, and Burdett's lament is still applicable

> "The system is but a makeshift It is humiliating to be obliged to make this confession, but until the managers of the various institutions keep separate accounts of the actual expenditure on inpatients and outpatients to enable them properly to enforce economy throughout each establishment

It is unnecessary to complete his sentence Secondly a new effort is being made to compute a vacant bed factor "which is assumed to be the difference between the cost per *patient* week and the cost per staffed *bed* week of standing charges, including extraordinary and Regional Hospital Board expenditure" It is a praiseworthy attempt to bring under control one of the factors which disturbs comparisons Without sample figures it is difficult to see how it will work out in practice or exactly what use can be made of the figures

The hospital accounts on this somewhat improved basis are to be forwarded to the regional hospital boards by Aug 31 in each year, and regional hospital boards are asked to summarise the statements for submission to the Ministry of Health by Sept 30 Boards of governors of teaching hospitals are also to send their completed statements to the Ministry of Health by Sept 30 What is then going to happen to them ? Apparently they are never to see the light of day Free access to published comparative figures has been one of the greatest helps available to the hospital administrator of the past

1 Circular R H.B (50) 66

4 or 5 hours since the accident, the child's condition is grave, and in his anxiety he may run the plasma in too fast and risk giving her pulmonary œdema In a busy ward no nurse can be spared to sit with her and give her sips of water or to chart her pulse, temperature, and respiration at half-hourly intervals Probably no blood has been taken for a hæmatocrit estimation, if it has, the report will probably not come back till the next day, and the test is not repeated every 2 or 3 hours as it should be

For the next 3 or 4 weeks the child, if she survives, will be very ill, her wound has become infected with streptococci from the air of the ward, and she has high fever Dressings cause intense pain After many weeks the burns may be fit for grafting, but she may have little sound skin left to make large grafts, and her surgeon may have had insufficient practice in grafting technique If the first grafting fails others may fail also, for the granulations now have a tough and fibrous base Healing over several months, she develops contractures which may leave her with crippling deformities for life This story is not exaggerated, and it makes the case for the establishment of burns units something more than a nice idea for the future

Dr COLEBROOK has given a great deal of thought to the way in which such units should be laid out, and his detailed scheme is illustrated by a tentative plan of a treatment block The aims to be achieved are that all dressings should be done in "clean" air (that is, dust free air almost devoid of micro-organisms), that they should be done by a trained team using aseptic technique, that chemotherapy should be used and constantly checked by bacteriological findings, that patients should be nursed in properly designed cubicles, that the bacteriologist should act as "infection control officer" and should have a day-to day liaison with the unit, and that an operating-theatre and anæsthetist should always be available, so that grafting can be done at the best moment (In many cases this would be on the day of the accident) The centre, he believes, should be part of a general hospital, depending on it for such things as anæsthetics, radiology, and laboratory investigations The building would hold three sectors sector A, for the treatment of outpatients, and the aftercare of inpatients, sector B, for the early non operative treatment of fresh burns which are to be admitted to the wards, and sector C, for the later treatment of inpatients, and all those who need operative repair Dressing and treatment rooms in all three sectors would be air-conditioned and reached by way of an air-lock

On admission to the centre a case would be classified as slight, moderately severe fresh burn, moderately severe old burn (more than 12 hours old, and probably infected), or severe fresh burn Slightly burned patients would go to sector A for dressing Those with moderately severe burns would go to sector B, to the clean (air conditioned) admission room where their clothes would be removed and the burns covered by a sterile towel, and thence into the plenary treatment room, reserved for the first dressing of all fresh burns After being dressed, patients would be taken to cubicles in the wards, or—if suitable for immediate grafting—back to the clean admission room, and thence to the theatre in sector C After grafting they would, of course, go into cubicles Those with moderately severe old burns would go to the "dirty" (but air conditioned) admission room in sector C, and thence to the main dressing station, and so to a cubicle Thus early uninfected cases would never enter a room that had been used for the treatment of an old case Air conditioning in dressing rooms can be so arranged that 15 minutes after a patient has left the room there are no more organisms in the air than there were before the dressing started The minutiæ for avoiding any contamination of the burned area are set out by Dr COLEBROOK with the thoroughness which comes only of long experience of the dangers, and an imagination trained to outflank the unexpected

The treatment of a burn is always in some sense an occasion of defeat, for nearly all burns, and particularly the burns of children, could have been prevented Dr COLEBROOK has long been fighting for the fireproofing of materials, for the guarding of open and electric fires, and for more general awareness of the danger, which would cut down our 2000 deaths a year and prevent much severe pain But some lives and much pain could be saved, and many crippling deformities avoided, if every burned person could have the care of a well-trained team in a well-equipped unit The case mortality at the Birmingham Accident Hospital for 241 burned children, in 1946–47, was 1 7% This may be compared with the mortality for 366 hospital cases in Edinburgh during 1938–42, of 4 9% (10 3% for children with burns and 3 7% for scalded children)[2] The proper care of these patients means extra trouble, just as aseptic surgery meant extra trouble, but it is trouble which we cannot justifiably avoid

Diaphragmatic Hernia as a Cause of Anæmia

ANÆMIA of the iron deficiency type is very common in women over 40 Most of these cases are primary anæmias, but some are the result of chronic loss of blood, either uterine, from a local lesion or menopausal "flooding," or gastro-intestinal. Among the unusual causes of bleeding from the alimentary tract is diaphragmatic hernia, and this is not likely to be suspected unless the doctor knows of its association with anæmia, since the symptoms are seldom helpful. However, it deserves to be included among the conditions to be looked for, because diaphragmatic hernias are not really very rare As long ago as 1912, GIFFIN[3] collected 650 published cases, though only 15 of them had been diagnosed during life Since radiography of the alimentary tract has become commonplace, some 1–3% of these examinations have revealed a diaphragmatic hernia, and at the Mayo Clinic alone 600 cases were diagnosed[4] between 1926 and 1941 Much the commonest form is herniation of the stomach through the œsophageal hiatus other types result from congenital abnormalities such as short œsophagus or absence of the posterior part of the left diaphragm, and various abdominal organs have been known to get through into the chest The typical patient with a diaphragmatic hernia is a short stocky elderly woman with symptoms suggesting cholecystitis or peptic ulceration—epigastric pain, flatulence fullness after meals, or heartburn The condition has been confused with coronary disease because it may cause substernal pain radiating to the left arm True regurgitation of food, or epigastric pain brought on by lying down, should always suggest hiatus hernia

2 Wilkinson A. W *Brit med J* 1944 i 37
3 Giffin H Z *Ann Surg* 1912 55 388
4 Harrington S N *Amer J Roentgenol* 1943, 49, 185

ier investigated the relation between water and salt sorption Urea and mannitol were used as osmotic ties so that the urinary volume was increased some but there was only a trivial increase in NaCl and CO_2 excretion Thus in the rat sodium and water sorption are largely independent The contents of proximal tubules and loops of Henle are isosmotic, ater is presumably passively reabsorbed preserving omicity as the solids of the glomerular filtrate pass ugh the tubular cells This finding outmoded shall's theory that the loops of Henle were the main s of osmotic work for water reabsorption In fact seem to play the part more of osmotic dialysers, so their contents reach the distal tubules isotonic a plasma The maximum reabsorptive capacity m) of the distal tubules for both water and salt may mited by critical constants If this is true and the osorption of sodium in the proximal tubules is stant, sodium loss in the urine will depend on glomerular filtration rate Such an assumption is ported by Merill s theory, which is now fairly generally epted, that the sodium retention of chronic congestive ure is due to reduced glomerular filtration rate but y research techniques are needed to study F^d_m before s point can be settled

Dr Homer Smith ended his narrative on a more homely d reassuring note by stating his belief that urea and eatinine clearances are still very useful clinically, even they lack the refinements of research methods, and ough the creatinine clearance in particular is hard to terpret in the presence of heart failure

HOPEFUL SIGNS IN MENTAL NURSING

PSYCHIATRY is pre eminently a field in which the best edical attention and treatment can be nullified by poor ursing, but the most conscientious nurses cannot fail o give poor service if they are pushed beyond reasonable mits The reports of the Board of Control and more cently, of the Minister of Health, have been depressing a their repetition of complaints that treatment of mental dness is being held up by a desperate shortage of nurses There is now some evidence that the vicious circle of vastage—longer hours—increased wastage is being roken In the years 1937–43 the average wastage of tudent nurses from mental hospitals was higher than in ny other type of hospital[1] It stood at the distressing igure of 82%, while the tuberculosis sanatoria lost 5% and the general hospitals lost 37% Over the past welve years there has been a dramatic fall in the intake f female mental nurses In 1938 it was 9600 but in 1945 had fallen to 2400 Since the inception of the National Health Service this trend seems to have been reversed t is difficult to compare figures, because they are now ollected and arranged differently, but some conclusions an be drawn from the fact that there was an increase of 000 nurses in training (all types of hospitals) between ulv, 1948, and December, 1949 and an increase of early 1000 in the *total* nursing staff in mental hospitals he mental-deficiency institutions, on the other hand, ost 63 nurses in the same period.

It is difficult to assess requirements, because not nly are most mental hospitals understaffed for their resent commitments, but most of them ought to ncrease their beds Even if nurses were available to aff these beds it is by no means certain that the money o maintain them would also be forthcoming the recent uts in estimates may force mental hospitals to close ome of the beds they already offer The present shortage f nurses might then even be eased for a time Bearing ll these variables in mind it is possible to estimate he present need at roughly 8000 (2000 of them ales)

In recruitment the mental hospitals have to fight a public opinion which still thinks in terms of asylums where all hope is lost At the Schoolgirls' Exhibition, held in London last month, a mental hospital was for the first time represented in the nursing section The Claybury Hospital stand attempted "to enlighten the public as to conditions in mental hospitals and to recruit girls into the profession of mental nursing" In accordance with this double purpose, the stand showed modern instruments of treatment—such as apparatus for electric-convulsive therapy, and leucotomes—besides instruments used at Hanwell in the last century for mechanical restraint Occupational therapy work, and photographs of the hospital departments and wards gave an impression of cheerfulness and hope The exhibit which attracted most attention was one of intensely dramatic free-expression painting by a schizophrenic girl, the series showing unmistakable improvement to the most unpractised eye

Opinions vary on the exact value of this type of exhibition It seems probable that as far as immediate recruitment is concerned, it preaches only to the converted But better understanding of the increasing hope in psychiatric treatment must surely bring a response in the future The medical and nursing professions are largely to blame for public ignorance, and there is a good deal of ignorance among doctors and nurses themselves The Ministry of Health is hoping to produce a short documentary film which will emphasise that insanity is merely a form of illness, and that much can be done for it It will be some time before this can be made, but in the meantime there is plenty of room for other types of educational propaganda such as that offered by the National Association for Mental Health

RADIOTHERAPY OF CANCER IN THE MOUTH

A Medical Research Council team, headed by Dr Constance Wood and Mr J W Boag, B SC, and drawn from the council's Radiotherapeutic Research Unit, has been comparing the efficacy of gamma rays and X rays in the treatment of cancer in the mouth Their report,[1] now published, was eagerly awaited because of the urgent need to decide whether money would be better spent on the development of radium beam units in all major centres or on other forms of apparatus Human therapeutic experiments that will satisfy the statisticians are always difficult to devise and to carry out, but in these trials careful planning, with strict standards of comparison and physical control, ensured complete accuracy within the limits set The comparison made was between the gamma beam from 10 grammes of radium and an X ray beam at 180 kV, so arranged that the isodose curves of the two types of radiation were almost perfectly matched Beam direction was obtained by using treatment callipers, and tumour dose was calculated with measuring callipers or with the contour finder devised for the purpose and described in the report

Statistical analysis, with special methods of estimating survival rates, has given the following results The estimated cure rate at 5 years for patients treated with the radium beam is 31% (the actual survival rate at $4^1/_2$ years which was not known until after the report was written, is 28%), and with the X-ray beam 19 2% (actual survival rate at $4^1/_2$ years, 20%) The difference between the 5 year rates is 11 8%, which is less than 1 62 times its standard error and therefore not significant The final conclusion reached in the report—"This investigation does not show that the wavelength of the radiation per se, within the limits of the experiment, has any significant effects on the clinical results"—

1 Report of the Working Party on the Training and Recruitment of Nurses. 1947

1 Researches on the Radiotherapy of Oral Cancer *Spec Rep Ser med Res Coun. Lond* no 267 1950 H M. Stationery Office Pp 148 12s 6d

So and so shows a low figure for such and such a heading —how does he manage it? This kind of thing can exert a great influence in the right direction One is bound to suspect that if the figures are never published much of this keenness to excel will be exchanged for a scrutiny by officials not themselves engaged in the actual administration of hospitals This is a move backwards rather than forwards, but it is one that could easily be set right by a decision to make an exception to governmental practice in the case of hospital accounts and publish the figures

DEVELOPMENT OF MODERN RENAL PHYSIOLOGY

ADDRESSING the lately formed Renal Association on July 15, Dr Homer Smith, of New York, gave a lively account of the development of our knowledge of renal physiology, beginning with the European work of Heidenhain Ludwig, Starling, and Cushny, and concluding with the more recent American advances of such men as Richards, Marshall, Walker, and (though he did not mention it) the speaker himself

Modern theories of urine formation, he said, owe their first scientific support to Cushny, who separated the wheat from the chaff of much of the older work He brought to light the controversy between the supporters of the secretion and the filtration with reabsorption theories, casting his own lot with the latter Instead of crediting the renal tubules with powers of apparently purposeful selection which amounted almost to vitalism, he assumed that they reabsorbed a fluid of constant composition In 1917 Richards, on a war time mission to England, met Cushny, and his work with Cecil Drinker gave him the experience of perfusion experiments which he was then able to apply to the kidney Thus began the work of Richards and Plants on the "adrenaline paradox" They found that adrenaline increased the resistance to perfusion of an isolated kidney, but that at the same time the kidney volume increased This they explained by assuming that adrenaline constricted the efferent glomerular arterioles more than the afferent ones, but we now know that adrenaline constricts not only these two types of vessel but also (most powerfully of all), the venules, thus damming back the blood in the organ Inspired by Krogh's studies of frog capillaries Richards and Schmidt sought to test this hypothesis by direct microscopical observation Though this work did not achieve the result they hoped for, it did lead to the observation of the intermittent activity of the frog kidney glomeruli This concept tended to be transferred to the mammalian kidney, but, as was shown later, without justification In amphibia the control of diuresis is probably exercised by changing the number of glomeruli in action, whereas in mammals the glomerular activity remains relatively constant, and diuresis is under predominant pituitary control

The work for which Richards and Wearn are best known developed from their micro technique for the cannulation of amphibian renal tubules Chemical study of the tubular contents established basic data on sites of tubular action on specific constituents of the glomerular filtrate But the nature of the experiments did not allow of differentiation between tubular reabsorption and secretion E K Marshall soon provided evidence that phenol red and urea were treated differently by the renal tubules, for whereas a rise in plasma urea concentration was associated with a parallel rise in urinary urea elimination a plasma elevation of phenol red was associated with a steep rise in urinary phenol red and then a flattening off to an asymptotic value Such a result could not be explained on the basis of ultrafiltration alone Furthermore phenol red was concentrated in the renal cortex even when the blood pressure was too low for appreciable filtration to occur In any case some 80% of the phenol red was bound to plasma proteins therefore not filtrable Marshall and Graffin's study the toadfish's aglomerular kidney, which is only by venous blood, proved finally that tubular secretion does occur Richards's rejoinder was to congratulate Marshall on having found an animal to suit theory

Another great advance, the era of clearance studies was initiated independently by Richards and Shannon both of whom selected inulin as an inert, not too readily diffusible, substance which would traverse the glomerular filter and not be reabsorbed Though inulin clearance is a better index of glomerular filtration rate in the dog than in man, it still has a wide usefulness in human research Shannon's work on the threshold for tubular reabsorption of glucose was the forerunner of the subsequent studies on the maximal tubular reabsorption or T_m, of such substances as ascorbic acid, sulphate, phosphate, uric acid, ketone bodies, and the amino acids Urea was found to be an unusual compound that it is passively reabsorbed with most of the water in the glomerular filtrate The theory of ultrafiltration with its necessary corollary of reabsorption, involves concentration of the reabsorbed material against a gradient, and this means that work must be done The capacity of the renal tubule cells to do so much work in a given time is limited, and this restricts the kidney's power of reabsorption Clearance studies of substances which are actively secreted by the tubules give an indication of tubular mass when the plasma levels are high, and of renal blood flow when they are sufficiently low for the material to be virtually completely cleared from the blood in one circuit through the kidney 'Diodrast' (diodone) and *p* aminohippurate (P.A.H.) are the two substances most suited to this purpose They both give the same extraction ratios in dog and man, and in eight different laboratories this figure for man is 0 914—i e, 91 4% of diodone or P.A.H. is cleared from the blood on traversing the kidney once The remaining 8 6% is probably attributable to the small amount of blood which reaches only those parts of the kidney not concerned with the process of urine formation

Clearance studies on man have given results which would probably have seemed incredible to Cushny, whose ideas they so largely vindicate Thus some 1200 ml blood (15–20% of the cardiac output) passes through the human kidneys each minute As plasma this represents about 700 ml, and 130 ml of this is ultrafiltered through the glomeruli—i e, 18 litres of glomerular filtrate is formed per day Contained in the 18 litres is 1200 g NaCl 400 g $NaHCO_3$ and 200 g glucose, yet the amounts actually passed in the urine are only about 0 8 0 2, and 0 1 g respectively The accurate control of the body's electrolyte and water content is a most important kidney function, which depends on the maintenance of the correct renal blood flow, but the means by which this flow is regulated are still very imperfectly understood The next chapter of research in renal physiology, Dr Smith said, is likely to be concerned mainly with the glomerulo tubular balance for this is surely the key to the precise workings of the whole organ

In man the glomerular filtration rate is relatively stable, but in the dog and especially the rat it is less so On the tubular side it appears that in the proximal part there is a large obligatory reabsorption of water and salt constituting in man about 85% of the water in the glomerular filtrate, and that only the remaining 15% of the water is facultatively reabsorbed in the distal part of the tubule Walker and Oliver in their puncture experiments on rat kidneys showed that 50–80% of the NaCl is reabsorbed in the proximal tubules, and the

BRITISH MEDICAL ASSOCIATION

the official religious service, held in Liverpool edral on July 18, a large congregation heard the OP OF BIRMINGHAM declare that, after four centuries, post Renaissance era was drawing to a close In phase that was now opening the outlook would be amist, and would be profoundly influenced by the rth in scientific knowledge As to progress in icine "It is already clear that possibly the most ortant medical research of the future will be con ed with the elimination from human stocks of etic defects, and with the production of human es finer than any that have hitherto appeared It is ong such human types that the finer kinds of religion ethics will, in ages to come, show themselves" The easing importance of medical science was already lent "New knowledge is likely to bring ethical and gious changes which will be more significant than ernal progress Among the consequences of an over ulated world are starvation and warfare Medical nce, in many ways so valuable to humanity, is not hout some responsibility for both calamities" The hop went on to express his disbelief in material tter The two fundamentals, he said, were not nd and matter but mind and conduct

At the annual dinner on July 20, attended by some 550 ople, Lord HOBDER spoke of Liverpool as the gateway of e west, the focal point of the Battle of the Atlantic and city unique in having two cathedrals built in the 20th ntury In medicine it had taken a lead especially in ublic health, in tropical medicine, and in orthopædics esponding the LORD MAYOR (the Rev H D Longbottom) id that, for all its slums and dark patches, Liverpool was city of variety and charm, and the VICE CHANCELLOR r J F Mountford) mentioned that among the university s orities the new medical school had almost the highest ice Prof D R SEABORNE DAVIES, proposing The B.M.A, d that justice was the supreme good, and justice for the tient was unattainable without justice for the doctor plying as chairman of council Dr E A GREGG said that ough the B.M.A. existed partly to advance the interests those who practised medicine, a great proportion of its ergies was devoted to improving the practice of medicine would have preferred to see the National Health Service troduced in stages, but, now that the service was here, embers of the profession must do nothing that would enable anyone to point a finger of scorn at them All must realise, however, that warfare for health against disease was, like other warfare, expensive, and there must be no stinting of resources he spoke particularly of the needs of the public health service SIR HARTLEY SHAWCROSS MP, proposing The President, referred to Sir Henry Cohen's accession to the chair of medicine at 34 and of his long and untiring public service all three political parties had sought his advice and it had been given objectively In his reply SIR HENRY COHEN took the opportunity to pay tribute to all those who had made the meeting a success In dealing with the toast of The Guests, on which he had produced a 93 page preliminary memorandum, Mr BRYAN MCFARLAND said there were those who thought that a dead hand had been laid on medicine and that its spirit was like to die But the profession had remained free and faithful through worse trials than the present and its voice would rise again triumphant and clear Lieut Colonel R FLEETWOOD HESKETH (mayor of Southport), Dr A J ORENSTEIN (South Africa), and Dr DAG KNUTSON (Sweden) responded

Among the films shown at the meeting were the following

Treatment of Infections of the Hand—This new film, illustrating the practice at the hand clinic of the surgical unit, University College Hospital, London, was sponsored by Glaxo Laboratories Ltd, and produced by the Realist Film Unit Ltd under the auspices of the British Medical Association In sound and colour, it depicts clearly treatment that can be carried out single handed, and the need for choosing the right moment for surgical intervention is properly emphasised The value of the film is enhanced by the summary with which it ends (116 mm, running time 28 minutes)

Total Sympathectomy for Hypertension—In sympathectomy operations, few onlookers can hope to see what the surgeon is about, because of the depth at which he is working Thus this film, by Mr A Dickson Wright, which illustrates the procedure by the retropleural approach, should prove very popular for, thanks to efficient illumination, even the deepest planes are clearly shown (16 mm, silent and colour running time 15 minutes)

In his public lecture at the close of the meeting, Dr C O STALLYBRASS called for a national effort to eradicate tuberculosis "And in this I know," he added, "that I represent the views of many, heavily disheartened and overworked, of those engaged in tuberculosis preventive work"

Scientific Sections

MEDICINE

President Prof. E N CHAMBERLAIN

Modern Conceptions and Therapeutics of Cardiac Failure

Prof. E P SHARPEY SCHAFER spoke of the need for satisfactory definition of heart failure To define it failure of the heart to pump in a proper manner ould embrace other conditions not commonly accepted heart failure, and it overlooked complex alterations the pressure/flow relations occurring in the peripheral ssels The vascular response of the normal subject changing from the recumbent to the erect posture nsisted in vasoconstriction, elevation of the arterial ood pressure, and diminished peripheral blood flow y contrast the patient with cardiac failure developed ese changes when he passed in the reverse direction om the semi erect to the recumbent position Elevation the venous pressure was the important factor precipi ting an attack of acute left ventricular failure, which as associated with intense vasoconstriction, raised rterial pressure, greater cardiac work, and dyspnœa asoconstriction and dyspnœa produced further venous essure rise, completing a vicious circle which could be oken by treatment designed to lower the venous essure It was tentatively suggested that these anges resulted from modification of the normal postural hæmorrhagic reactions

DR RICHARD BAYLISS said that pulmonary hyper tension occurred in less than half the cases of emphysema and mitral stenosis In the patient with emphysema, pulmonary hypertension, and right ventricular failure oxygen therapy would lower the pulmonary arterial pressure it was not yet determined whether this effect was due to vasodilatation or to a fall in the cardiac output It was uncertain what part pulmonary arterio sclerosis played in the maintenance of raised pulmonary arterial pressure in patients with a severe degree of mitral stenosis The answer could only be obtained by observing the results in patients with this condition who underwent valvulotomy

DR PAUL WOOD was provocative in his remarks on raised venous pressure, which, he said, could and did exist without precipitating cardiac failure He instanced, among other examples, the "high output states" associated with anæmia and thyrotoxicosis, in which it was often difficult to tell when patients passed into cardiac failure He denied emphatically that digitalis exerted its effects by lowering venous pressure, and he illustrated absence of this action in a series of patients with raised venous pressure and high cardiac output but without heart failure Postural treatment was vital and many more cardiac beds should be available A low-sodium diet had been devised containing less than 1 g.

will be generally accepted But it is not the complete answer to the question whether the radium beam has special advantages as a therapeutic instrument Before forming an opinion on this question several striking findings in the report should be considered

The detailed statistical tables show that at least eighteen patients with palpable lymph glands, seven of whom were treated with the X ray beam, were symptom-free for 3 years or longer Cure of malignant glands by radiotherapy is rare enough to make this a considerable achievement, and the report points out that the usual view that secondary cancer in glands is more resistant and responds more slowly to radiation than the primary tumour was not borne out in this series, in which the glands often disappeared first This suggests a special place for the radium beam, or even for an X ray beam of this type, in the treatment of cases where cancer in a difficult site, accompanied by palpable lymph glands makes block dissection of the neck almost impossible

The effect of the two types of radiation on the skin is also important It was found that the cases treated with X rays developed skin reactions earlier and more severely, so a further comparison was arranged between symmetrical fields on the two sides of the neck of patients with suitable lesions, the fields on one side being treated with gamma rays and those on the other with X rays This experiment showed that the average ratio of gamma ray dose to X ray dose for the same visible skin reaction was 1 34 1 Thus gamma radiation has a definite advantage, even if this is due to differences in penetration and absorption and not to any specific wave length effect There is thus some evidence that beam therapy has special uses and that, even if the experimental X ray beam was a practical instrument, beam therapy should be given by means of gamma rays

In the radium beam we have a source of radiation with which the block of tissue which contains the tumour can be raised to the required dosage, and which, if the tumour is superficial enough, gives a rapid fall in dosage outside this block, thus increasing the tolerance of the normal tissues Analysis of the results of treatment by site indicates the sites in which conditions are favourable for radium beam treatment Unfortunately, however, in some sites, particularly the pharynx, this method, in common with all others, results in so few survivals that no conclusions can be drawn from the figures For lesions at the back of the mouth, and for some laryngeal lesions, more particularly when the lymph glands are involved, provisions for radium-beam therapy should certainly be made The report says "Such apparatus" [the 10 gramme bomb] "may continue to be used in routine treatment for some time to come", it might have gone further and expressed the belief that some form of beam therapy, with either radium or radioactive cobalt, will continue to be used so long as irradiation is chosen for the treatment of oral cancer

SIR HERBERT BARKER

Few unqualified practitioners in medicine reach the eminence attained by Sir Herbert Barker His death at the age of 81 ends a career that roused strong feeling in the medical profession and brought controversy to a focus The son of a solicitor, he became, at 19, assistant to his cousin, John Atkinson, who derived his knowledge of bonesetting, by a sort of apostolic succession, from the Hutton family, yeoman farmers of the North Starting for himself in practice in Manchester, he found many patients among footballers and athletes, and won the confidence of Walter Whitehead, professor of clinical surgery in Manchester University [1] A first attempt to start a practice in London was abortive, but after a period in Glasgow he returned and had great success

1 *Manchester Guardian* July 24 p 8

A most skilful and intelligent manipulator, he f times succeeded where qualified practitioners had t and a number of doctors encouraged their patie go to him—or went to him themselves On the o hand the profession, as such, can never agree that pe who have not had a basic medical training can pr be entrusted with the full care of a patient ab the ultimate responsibility must rest on someone tr in comprehensive diagnosis rather than in a therap technique Professional opposition, carried rather to prevented any official use of Barker's services in t treatment of injuries during the 1914–18 war, and o the General Medical Council to remove the name of anæsthetist, Dr F W Axham, from the Medical Re for the offence of "covering" an unregistered practitio The case of Dr Axham was long and bitterly debat the public thought it a monstrous example of profess obscurantism, and a sense of discomfort within t profession would have led to the restoration of Axham's name had he not died first, in 1926 Meanwh the knighthood conferred on Barker in 1922, and demand that he should receive a Lambeth M.D., reflected the public respect for his abilities, and more and more doctors were prepared to believe that a with so much practical experience, and art, might hav knowledge, or at least dodges, which could usefully embodied in orthodox practice In 1936 the Brit Orthopædic Association accepted his offer of a demonstra tion, and a report by Mr W Rowley Bristow, publishe in our columns [2] describes how Sir Herbert Bark treated 18 patients at St Thomas's, where films we later made of his techniques

> "He taught," Mr Bristow wrote, "the value repeated manipulation, the value of traction, personal supervision and attention to exercising th joint in all directions afterwards, and above all think, the splendid optimism which is essentially a par of treatment, and a necessary part, in helping those with long standing disabilities, whose confidence has been rudely shaken by failures of the earlier efforts at cure It is due to Barker to say that but for his pioneer wor the manipulative field of orthopædic surgery would n occupy the position it does today, and that had his off to demonstrate his technique been accepted twenty fi years ago the general utilisation of this branch of therapeut would not have been so long delayed"

But though Barker did not quite realise it (Mr Brist thought) the battle was already won "Orthopæd surgeons now practise manipulative surgery as essential part of their specialty"

INTERNATIONAL CONGRESSES

Last Monday the sixth International Congress Radiology, which is being held in London under t presidency of Dr Ralston Paterson, was rung in six strokes on a silver bell presented by British r logists to mark the silver jubilee of these internat meetings Afterwards the Earl of Athlone form opened the proceedings, and Sir Henry Dale welcom 2700 delegates from 54 countries on behalf of Brit science and medicine and on behalf of the Governme At the dinner held at Guildhall on Monday evening t toast of the congress was proposed by Lord Mountbatte The exhibition of apparatus which is being held i connection with the congress shows the outstandi advances made since the last exhibition in 1937

Meanwhile at Oxford, Lord Addison, himself a form professor of anatomy, welcomed 550 delegates from countries to the international anatomical congr which is meeting there this week under the presiden of Prof W E Le Gros Clark, F.R S

On July 22 Prof Hilda Lloyd was re-elected presid of the Royal College of Obstetricians and Gynæcologi

2 *Lancet* 1937 i 546

rbances associated with fenestration operations, and
liation sickness

min B_{12}

J F WILKINSON outlined our limited knowledge
ne chemical constitution of vitamin B_{12} and the
nt recommended scheme of dosage Following an
al dose of 60 microgrammes, a weekly dose of 40 μg
ld be continued until the blood count was normal,
which a weekly or fortnightly dose of 20–40 μg
ld maintain a normal blood count

r DOUGLAS RIDING said that a non dialysable
ibitor substance was present in the gastric juice of the
mal human being, but not of the patient with perni
s anæmia, which combined with vitamin B_{12} to form
mpound in which the vitamin B_{12} was no longer
lable for bacterial metabolism, but from which
ight be recovered by heating He suggested that
inhibitor substance was the intrinsic factor of
le and served the purpose of rendering vitamin B_{12}
available to bacteria in the alimentary tract and
efore available for absorption, and that vitamin B_{12}
the extrinsic factor

Atypical pneumonia was discussed jointly with the
tion of pathology and bacteriology (see below)

SURGERY

President Mr J BAGOT OLDHAM

ricose Ulceration

Dr GUNNAR BAUER, of Mariestad, Sweden, began by
ing his immediate results with popliteal venous
ction for postphlebitic syndrome of the leg He has
erated on 245 patients, and in almost all of them
e "bursting" calf pain and leg œdema has been relieved
196 followed for over six months, 16% had recurrent
eration, but two thirds of these (i e, 18 cases) have
aled after ablation of the overlooked incompetent
perficial veins, and most of the remainder, who
owed some arterial insufficiency, have healed after
nglionectomy

Prof A M BOYD emphasised the magnitude of the
roblem and the need for an organised campaign to deal
ith the large number of cases He described the three
mmon types of ulceration those due to uncomplicated
perficial varicosities, those following phlebitis, and
ose of arteriosclerotic (or hypertensive) origin, some
gree of arteriosclerosis often complicating the second
pe Turning to treatment, after pointing out the
ngers of retrograde injection into the great saphenous
stem at the groin, he spoke mainly about phlebitic
cers After carefully evaluating the factors involved,
moving sloughs with eusol, controlling infection with
cal streptomycin (1 g per litre), and reducing any
elling by elevating the limb on a wedge mattress,
s practice is to excise the ulcer's fibrotic base and
ply a skin graft Venous stasis is controlled, and a
mbar ganglionectomy performed in cases with associated
terial insufficiency, the first lumbar ganglion being
vays excised to denervate the medial side of the leg
is not only improves skin nutrition but abolishes
eating and thereby lessens the liability to relapse

Mr A. C BREWER was interested in the possibility of
teriovenous shunts by passing the capillary bed in
ses of phlebitic syndrome, and sought to demonstrate
em by means of "timed" arteriograms Dr S D
CAUSLAND showed a coloured film, illustrating the
nservative measures he has long used and advised
ntinuous support after healing Mr MAURICE LEE, also
th the help of a film, described a skin grafting tech
que suitable for outpatients Strips of full thickness
in 5 mm wide and freed of fat are darned in and out
the ulcer granulations after these have been sterilised
local applications This method has led to rapid
aling

Mr A. J WALKER reported his initial results with popliteal venous section in 30 cases of postphlebitic syndrome, here also the bursting calf pain, local ulcer pain, and nocturnal cramps have been relieved He has measured the venous pressures at rest and on exercise in the dorsal veins of the foot. In patients showing a rise of pressure on exercise, results have been poor, and this finding may prove to be a contra indication to the operation

Mr A DICKSON WRIGHT pointed out that most cases of leg ulceration occur in obese working class women in late middle age, and he was loath to advise major procedures which were not yet well established

THE CHAIRMAN said that the crux of the problem lay in the elucidation of the vascular pathology He drew attention to the frequent violent eczematous reactions to penicillin and sulphonamide creams applied to leg ulcers and asked the opening speakers to define the clinical indications for the operative techniques described

In reply, Professor BOYD laid stress on the need for continued personal supervision The patients are supplied with an elastic stocking, the 4 in × 12 yd 'Latex' bandage, which in his view is far superior, being difficult to obtain No one treatment is suitable for all cases and each must be dealt with on its merits In diagnosis if an Esmarch bandage is applied to a phlebitic leg it gives rise to great pain on exercise, whereas it produces no pain in a simple varicose leg He agreed that, the measurement of venous pressures, arteriography, and venography are research investigations Dr BAUER then described the method of venography and measurement of popliteal venous pressure during operation which he uses to detect incompetent valves He keeps his patients in hospital as a rule until their ulcers have healed and then supplies them with a supporting bandage

Burns

Mr R P OSBORNE urged the need to lower the high incidence of burns and for more burns units The first-aid treatment consists in covering the burnt area with the cleanest material available and giving hot sweet drinks The plenary treatment includes that of shock plasma loss should be limited by elevation of the part, if possible the application of pressure dressings, and the administration of plasma, controlled by frequent hæmatocrit readings Anæmia always develops in burns of over 8% of the body surface and anticipatory transfusion is essential This should be combined with high protein and vitamin therapy In the theatre, after cleaning with 1% 'Cetavlon,' he uses either penicillin cream applications or the Bunyan Stannard envelope technique Unless the initial dressing works loose, or becomes saturated with plasma, or the patient's temperature rises, the dressing is not disturbed for 10–14 days Early separation of sloughs is encouraged by the envelope method of irrigation with 'Milton,' &c, to permit skin grafting Small full thickness burns can be dealt with by immediate excision of slough and grafting, otherwise this is done when the granulations are firm, flat, and free from hæmolytic streptococci

Mr J P REIDY said that early grafting reduces toxæmia and produces rapid healing and restored function Grafts of split skin, ½ in square, are most economical and satisfactory Pinch grafts are never indicated, though full thickness grafts and skin flaps are useful when healing has been achieved. Homogenous grafts are used as a temporary measure to aid in covering a very large area until the patient can provide more skin for himself The failure of grafts to take may be caused by the patient's poor general condition, or by inadequate skin graft fixation and unhealthy granulations, though the presence of a few organisms does not absolutely contra indicate grafting The covering of one part of the burn must not be delayed because another is

of sodium per day, and a patient on this diet did not require more than two or three injections of a mercurial diuretic at the beginning of treatment

Dr WILLIAM EVANS thought that there was too much experimental investigation of the already overburdened heart Observation of the clinical condition of the patient and of his response to therapy provided all necessary information for the purposes of treatment and prognosis Rapid digitalisation could be achieved when necessary by administering 2 5 mg digoxin orally, but the patient should be maintained on digitalis leaf, its use should not be limited to auricular fibrillation, for it was of value in sinus rhythm, right ventricular failure due to emphysema, and myocardial infarction He had not seen paroxysmal ventricular fibrillation which could be attributed to digitalis in myocardial infarction

Ulcerative Colitis

Prof T L HARDY, introducing this subject at a joint meeting of the section with the section of surgery, emphasised our ignorance of its ætiology Micro organisms were only present in the rôle of secondary invaders of the ulcerated bowel Among psychological factors, immaturity of outlook and parental attachment had been stressed, but these appeared to be non specific in nature and were often seen in control series There was evidence that emotion, through impulses mediated by the vagus, could produce alteration in the state of motility of the colon stimulation of the sacral autonomic outflow had produced overactivity, engorgement, and ulceration The protective action of mucus was well established, and the finding of excessive quantities of the mucolytic enzyme, lysozyme, in the stools of sufferers from ulcerative colitis suggested that this might be a possible ætiological factor, but recent work had shown it was more likely to be derived from and associated with the pus in the stools Three patients had been treated with adrenocorticotropic hormone with resulting symptomatic remission, but the rectal mucosa remained abnormal It was too early to express an opinion on the usefulness of chloramphenicol and 'Aureomycin,' but results encouraged further trial although the mucosa had never been seen to return to normal, the drugs only reducing the secondary invading organisms Ileostomy was advised more and more frequently in selected cases

Mr A HEDLEY WHITE said that he was pleased to note the agreement which existed between the physician and surgeon about treatment in the chronic and relapsing types of ulcerative colitis Ileostomy was the treatment of choice except in the acute fulminating case, which required resuscitation as an emergency measure Ileostomy did not cure the condition, which, in a proportion of cases variously estimated at 2 to 10%, would continue to progress and lead to the development of pseudopolyposis coli and carcinoma Colectomy should therefore follow ileostomy

Dr J W PAULLEY gave an interesting account of his psychological investigation and treatment of 173 patients with ulcerative colitis In addition to the prominence of mother dependence, disturbed emotional relations in the home were notably common Financial stress or frustration played no part As a group, the patients lacked aggressiveness and preferred to avoid domestic quarrels but they would harbour a smouldering resentment with the air of martyrdom, brooding over real or imaginary wrongs They were querulous and ungrateful The men were effeminate, and both sexes were neat and fastidious, exhibiting false modesty and a poor sense of humour Therapy was time consuming and was directed initially towards transferring possession from the mother to the therapist, who could then encourage the patient to acquire self dependence Improvement had been obtained and maintained without the need for surgical intervention

Mr HAROLD EDWARDS advised an elective three ileostomy and colectomy, for other operations liable to produce complications later, particularly intestinal obstruction With the advent of the new antibiotics, appendicostomy and continuous irrigation would be worth a trial

Mr J A SHEPHERD described the advantages of a "spout" ileostomy over the more usual flush type, and Mr DICKSON WRIGHT emphasised the importance of early operation in the patient with segmental colitis where anastomosis was possible, with complete excision of the affected segment of colon

Anti histamine Compounds

Prof J H BURN, F R S, opened the discussion by describing experiments begun in 1945 to discover an effective substitute for quinidine Local anæsthetics, spasmolytics of the belladonna group, pethidine, and 'Neoantergan' ('Anthisan') were found to have a quinidine like action Neoantergan also possessed local anæsthetic and analgesic effects Dutter confirmed these findings, extended them to other members of the anti histamine group, and demonstrated their effect in reducing the action of acetylcholine on the skeletal muscle of the frog and the rat, and their ability to block impulses in perfused ganglia Thus the anti histamine group of drugs possessed many of the properties of, or in this respect resembled, more familiar substances and it could be predicted that side effects, such as dryness of the mouth and mental confusion, would inevitably ensue from their use As 'Benadryl' and hyoscine were closely related in their action, and hyoscine, in his opinion, was the best available seasickness remedy it was not surprising that Dr Gay had found 'Dramamine'—which was only benadryl with an added theophylline grouping—an effective remedy in this condition, but Professor Burn had seen no evidence that it was more effective than hyoscine Benadryl and anthisan were useful in the treatment of myotonia, in which condition quinine has long been known to bring relief, and they might find a place in the treatment of fibrillation in view of their quinidine like action

Prof D M DUNLOP considered the therapeutic use of the anti histamine drugs, and recounted the results of his experience with anthisan, benadryl, and 'Phenergan' Sleepiness and nausea were the most important side effects and occurred rather more frequently with benadryl dizziness, vomiting, and diarrhœa, though occurring less frequently, were rather more marked after anthisan Altogether, toxic effects were seen in over 60% of cases treated with benadryl and in 55% with anthisan Angioneurotic œdema and urticaria in more than 80% of cases, respond well to anti histamine therapy Perennial vasomotor rhinitis also responded, but similar success was achieved by employing inert tablets, and in the treatment of asthma inert tablets had caused a slightly greater decrease in the incidence of attacks than had anthisan

Dr LESLIE GAY (Baltimore) presented a detailed account of the large scale trials of dramamine in the prevention and treatment of motion sickness, conducted by himself the U S army and navy, and various American air lines He said that dramamine was a most potent prophylactic and therapeutic agent in this condition, and though it was true that no comparative studies using dramamine and hyoscine had been undertaken he could not agree with Professor Burn that such a study was necessary He was satisfied that the latter drug could not be used with the frequency and over the length of time necessary to provide effective control His experience in the United States, where car and train sickness appeared to be a more important problem than in this country, convinced him of the benefit obtainable from dramamine Dramamine was effective in the treatment of labyrinthitis

thought that there was a tendency to aim at too a standard in selection of personnel and that only obviously unsuitable should be discarded The nt to which history taking should be delegated to social worker was discussed

he PRESIDENT mentioned the growing practice of wing the social worker to be the receptionist he l that, as the psychiatrist is primarily a physician, should take personal responsibility for getting the ory and carrying out a skilled examination, calling the social worker for assistance at a later stage It generally agreed that it was unwise for the psychia t to treat both the child and the parent, but opinions ered about where to draw lines between the roles of social worker as an adviser, a teacher, and a therapist

Miss K M LEWIS, who had been nominated as a resentative by the Association of Psychiatric Social orkers, referred to the mutual trust that lies at the as of all team work, and Miss E Thomas, another resentative of the association spoke of herself as a ocial" psychiatric social worker and the approach human relationships as "an art rather than a skill" e danger of concentrating too much attention on the other and too little on the total family and social uation was mentioned by another member of the sociation

The meeting of the section ended with an exhibition id demonstration of *modern techniques in child psy iatry* held on the premises of one of the first psychiatric atpatient clinics to be established in this country The ontributions ranged from the newer psychodiagnostic chniques to the puppet theatre shown by Dr H S RYAN, and included an exhibit of psychiatric interest om the Moor House School of Speech Therapy The laudsley Hospital sent a comprehensive display of ducative value, comprising the organisation and equip ent of a modern child psychiatric unit, amply illustrated y diagrammatic and clinical productions Serial rawings by child patients under treatment were shown y the staff of Crichton Royal The progress of electro ncephalography as applied to children provided the opic for several exhibits, and Dr SESSIONS HODGE, Dr F H BODMAN, and their team of technicians armed vith a galaxy of electrical equipment gave an impressive lemonstration of some recent developments in photic timulation Diagnostic measures were more in evidence han therapeutic procedures, but there were encouraging igns of centres in the country where established methods f treatment are being refined and new techniques devised nd their results scientifically recorded

TROPICAL MEDICINE

President Prof R M GORDON

Parasitology in Relation to Dermatology

At a joint meeting with the section of dermatology, Dr R M B MACKENNA recalled that about a century go there occurred in Liverpool a grave outbreak of pidemic typhus imported in refugees from the Irish otato famine The mode of transmission was not nown, but as conditions of destitution and vermin infestation were associated with the infection the uthorities built disinfecting stations and public wash ouses, and typhus declined A second epidemic ollowed some twenty years later, as a result of the merican Civil War and consequent failure of the cotton rade During the late war infestation with the head-ouse was common in women joining the A T S, articularly among those from industrial areas, and hildren from the urban areas were also heavily infested ethane hair-oil, DDT, and so forth were used to educe head louse infestation as the possibility of typhus as considerable at that time Owing to the susceptibility of the head louse to changes in temperature and umidity, males with short hair were rarely infected

Diagnosis of a minor infestation with scabies in a cleanly person was difficult, and scabies infestation had been reduced by the use of 'Tetmosol' soaps A first infestation with scabies did not cause discomfort or gross signs for at least a month, but the patient then became sensitised and the diagnosis became clinically obvious If cured and reinfected, the patient immediately showed clinical signs Cat scabies infection was more prevalent in man than was realised Two parasites were involved—notoedres and cheyletiella, neither persisted long on the human, and the infections vanished when the offending cat was removed or treated New cats might become infected from the rodent population and reinfect man Pubic louse infestation, in which the eggs were small and dark and were attached to the hairs close to the skin, was commonly missed, particularly in women Insect bites were said to be more severe in those deficient in vitamin B_1, administration of this vitamin was reputed both to reduce the effect of the bites and to lessen the number of bites, but this was open to question

Prof R M GORDON discussed reactions in the human skin directly due to arthropods These reactions might be classified into four types due to (1) mechanical trauma, (2) secondary bacterial infection, (3) injection of substances to which the host had become sensitised, or (4) injection of irritant substances To the first group belonged the bites of any blood sucking arthropod, the nature of the lesions depending on the mechanism of biting Bacterial infection of wounds caused by arthropods was no more likely than with wounds caused by other agents A severe reaction to the bite of an arthropod was due to specific sensitisation to the bites of that particular arthropod The venomous offensive or defensive weapons of bees, scorpions, or spiders caused changes ranging from severe inflammation to extensive coagulative necrosis

Dr L E NAPIER stated that the skin cases encountered in Calcutta approximated to those seen in temperate zones Only a small proportion were due to local diseases among these, cutaneous leishmaniasis was prominent Two types of cutaneous leishmaniasis were seen in India a true cutaneous leishmaniasis, or oriental sore, due to *Leishmania tropica* occurred principally in the North West and post kala azar dermal leishmaniasis was found in the Bengal area following about a year after apparently successful treatment or spontaneous cure of kala azar It was very doubtful whether regeneration of the systemic infection in the form of kala azar resulted from the latter

Dr JOSEPH CAPLAN gave an account of dermal lesions in strongyloidiasis When he published his original account he thought this condition was confined to ex prisoners of war from the East, but he had since seen it in people who had not been in these camps Strongyloides creeping eruptions were of two types in one the tracks were narrow, while in the other they were about 1/2 in wide Extension of the tracks was much more rapid than with a classical creeping eruption. In the United Kingdom lesions had appeared some five years after infection, anatomically they might be extensive, and they were accompanied by an eosinophilia of from 10 to 25%

Dr D G FRESHWATER described skin lesions in cases of onchocerciasis in West Africa, and suggested that none of these lesions, other than the nodules, were characteristic

Intestinal Parasites of Man in Great Britain

Prof J J C BUCKLEY said that about a dozen species of worms had been recorded in man in Britain, of which only half could be regarded as normal parasites, the others being present owing to accidental infection from domestic animals Of the commoner nematodes, four occurred here—the roundworm, the whipworm, the

not quite ready He has used preoperative and post operative X irradiation to control keloid formation

Mr A B WALLACE emphasised the importance of controlled fluid replacement, incipient oligæmic shock is heralded by pallor, thirst, and restlessness He showed a chart which he uses as a guide to the intravenous therapy which is always necessary for burns involving more than 12% of the body surface Urinary excretion is an excellent guide to the adequacy of fluid therapy With the aid of a coloured film, Mr Wallace then described his "dry" method of local treatment The area is cleaned in the theatre with 1% cetrimide and thoroughly dried Penicillin powder in lactose is insufflated over the area and this is left exposed to the air in the general ward It is repowdered two hourly until a dry crust has formed—the best protection against infection Both superficial and full thickness burns thus treated do not become infected despite heavy air contamination When ready, the crust and slough are peeled off and the usual grafting measures employed

Mr H M BAITINGER, of Indiana, agreed largely with the first two speakers He aims at a 4000–5000 calorie diet with up to 150 g of protein daily, and he transfuses patients to maintain their hæmoglobin at over 85%.

Mr J A SHEPHERD preferred fresh blood to stored in these cases Clinical assessment of fluid requirements is better, he thought, than any rule of thumb—a point contested by Mr R MURLEY, who has found it easy to go very wrong unless some formula is used as a guide During a visit to Edinburgh, Mr Murley said, he was highly impressed by Mr Wallace's cases In the Army, Mr R B WELBOURN said, he found that grafts would take even in the presence of a *Ps pyocyanea* infection

Replying, Mr REIDY said he also uses a chart to guide fluid replacement Occasionally he has found a Blair or Humby knife useful in cutting grafts but the dermatome, he thought, is tedious and unnecessary Mr OSBORNE again emphasised the inevitability of anæmia developing after a burn of over 8% of the body surface, and the need to control this and to prevent sepsis Early skin grafting in his view is especially desirable to obtain a good result for the burnt hand

Ulcerative colitis was discussed jointly with the section of medicine (see above), and *renal failure* with the section of pathology and bacteriology (see below)

PSYCHIATRY

President Sir DAVID HENDERSON

The Psychological Involvements of Childbearing

The divorce of psychiatry from neurology and the establishment on this occasion of a separate section, gave an opportunity to the psychiatrists which Dr EDWARD GLOVER was quick to seize In opening the discussion he defined the relation between the two sciences of obstetrics and psychiatry, dealt with the contest between biological and psychological processes, and described normal childbearing in the face of powerful psychic inhibitions as representing the successful overcoming of the conflict He stated that, as revealed by play and fantasy, the average child is much more interested in pregnancy and childbirth than the adult, and that as man is constitutionally a bisexual animal, the female of the species is prone to regress to infantile sterile positions

He mentioned the clinical manifestations that may appear, including psychoneurotic anxiety states and character disorders, disturbances of menstruation and of the sexual functions, marital difficulties, psychogenic sterility, and the various psychogenic disorders of pregnancy such as pernicious vomiting and miscarriage Turning to the practical application of his theories he believed that antenatal psychological care should begin in premarital life, and that it should take the form not merely of treatment aimed at freeing the woman from guilt feelings, but a positive education for pregnancy beyond mere sexual information He believed th "psycho obstetrician" of the future would not from the case until weaning was complete

Prof W I C MORRIS, giving the obstetrician's of view, emphasised that the mother's attitude bearing a child was not always joyous, and might in different pregnancies or in the course of a pregnancy He gave, as an example, shame at conception, or shame because there had been a interval between pregnancies—for instance wh previous child had reached adolescence He spo the dangers of gossip and tittle tattle in anten waiting rooms, of the psychological vulnerability primigravida, and of the need for building up the mot prestige He spoke of the mother's fears durin first stage of labour, her fighting attitude durin second stage, her sense of disappointment on find the third stage that labour was not over, and the and sorrows of the puerperium A sense of exalta was apt to be followed by disillusionment, as the re of loss of freedom, change in economic circumstan and the fact that babies are born "with a strain arrogant wickedness in them," became apparent to Considering the advantages of hospital as compared domiciliary care, he decided that the scales were weig towards confinement in the home

Prof E W ANDERSON, in a closely argued statem on the significance of sexual maturity in women in th light of puerperal psychosis, added a note of crudit but the discussion was directed back to the hum element by Dr ELIZABETH TYLDEN's eloquent plea more enlightenment and for the application of comm educational principles to the subject She was stron critical of hospital practice and of the hard and punit attitude of attendants, more particularly toward primiparæ Discussing the social setting, she explained that childbearing—and she spoke as a mother—was n longer the only goal to which woman can reach, an referred to the change from freedom to dependence, from companionship to loneliness, and the heavy responsi bilities that resulted from *childbearing* She stress the need for giving mothers the opportunity to relie themselves of their anxieties, and of helping them t understand the process of childbirth

The discussion was informed and vigorous T importance of the field on the preventive side, th dangers of attempting to educate people by means of literature, the need for permeating the community wi better attitudes towards childbearing, the advantages domiciliary midwifery put forward by a general pra tioner, the idea of converting the hospital into a "home the practical obstacles in the form of risk of infecti the power of unhappy married life in prejudicing a c against sex and marriage, the possibilities inherent closer integration of child welfare and child guidan and in group discussions in the antenatal clinic to the dangers of 'antenatal chatter" and spread of information, were among the aspects discussed T subject proved a meeting ground for those mak different approaches, and set a standard of good feel and toleration of the viewpoints of others

The Rôle of the Psychiatric Social Worker

Dr J B S LEWIS discussed the need for psychia social work, the field, and the acute problem of sup and demand, he suggested as immediate measures employment of part time married workers, and recruitment of men and of other clinical worker, emphasised the importance of skilled selection of pers nel Psychiatrists, psychologists, and psychiatric so workers, he thought, should receive a basic training it were, from the cradle Later speakers confirmed importance of group training in outpatient departme and of close coöperation, frequent meetings, and discussion between the various members of the te

F I PRIME discussed bronchiectasis from a physio-al point of view It causes, he said uneven ventila of the lung resulting in arterial suboxygenation carbon dioxide content however is not usually d unless some secondary condition is present such evere emphysema In examinations of bronchiec e subjects he found that both the vital capacity and maximum breathing capacity were below normal he discussion which followed, several speakers pointed that the term bronchiectasis was loosely used and made a plea for a more rigid classification

he section joined the section of otorhinolaryngology a discussion of *Carcinoma of the Larynx* (see below)

OTORHINOLARYNGOLOGY

President Mr I SIMSON HALL

atment of Carcinoma of the Larynx

t was refreshing and convincing at this joint meeting hear at last such a wide measure of agreement between geons and radiotherapists on the management of ients suffering from carcinoma of the larynx Mr P WILSON Dr M LEDERMAN Prof V LAMBERT d Dr J J STEVENSON opened the discussion in the urse of which particular emphasis was placed upon e value of collaboration of the two specialties pre rably by joint consultation not only in deciding on e right kind of treatment to adopt but also in following e progress of each case The day is long past when diotherapy was regarded as a last hope to be employed ly when surgery is impracticable or has failed On e other hand long trials with radiotherapy alone have own, it was agreed that in early cases irradiation or cal excision each offer an equal prospect of freedom om recurrence, whereas in more advanced cases, articularly when the growth has extended backwards r downwards radical removal gives the best results dvances in technique and its use as a curative rather an a palliative measure have greatly reduced the iscomfort attending treatment by irradiation Sul honamides and antibiotics in combination with surgery, y lessening the incidence of postoperative infection ave led to a shorter and smoother convalescence For he same reason more extensive excisions can now be afely carried out on growths which formerly would have een considered inoperable, and which irradiation was nlikely to cure When a growth is confined to the nterior end of one vocal cord a cure can be anticipated n more than three-quarters of the cases either by surgery r by irradiation In such early cases however irradi-ion may often be preferred because it leaves the patient ith a better voice A growth extending forwards on to oth vocal cords should be treated by irradiation Any rowth that extends backwards on to the arytenoid gion of the larynx or downwards into the subglottic ea, particularly if it has led to fixation of the cord, n be offered a better prospect of lasting cure by ryngectomy In discussing doubtful cases speakers re in mind that whereas unsuccessful irradiation can netimes be followed by a surgical cure a postoperative urrence rarely responds to subsequent irradiation

afness in Children

Mr R R SIMPSON, Mr J H OTTY, and Mr T S RTLER were the openers of a useful discussion Per ment deafness in children, it was noted can in many stances be prevented by prompt and appropriate tention directed towards the cause In many urban eas—Hull and London were particularly mentioned—e school medical services have schemes in operation examining the ears and testing the hearing of all the pils Any child with defective hearing or diseased s is referred to a special ear clinic for diagnosis and y necessary treatment These clinics are maintained the local educational authority and are open during school hours the visits count as part of school atten dance Thus everything possible is done to encourage the pupil parent, and teacher to coöperate, particularly when regular daily treatment over a period is needed It is hoped that these centres will be allowed to continue their good work unhampered Children permanently but not totally deafened should be given the opportunity to use a 'Medresco hearing aid, supplied under the National Health Service In one centre a fairly large group of partially deaf children was trained in the use of this aid and it was found that both they and their parents quickly appreciated its value Moreover the teachers reported that all the children showed genuine pleasure in using an aid that their speech was improved and that they were much more alert mentally There were no complaints from this group of children about the size and weight of the aid and the incidence of repairs was no greater than among aids used by adults Another speaker reported that in a residential school for the deaf, a quarter of the children were found capable of benefiting by the use of aids and were supplied with them It was generally felt that so long as the demand for medresco aids continues to exceed the supply, children should receive the first consideration

OPHTHALMOLOGY

President Mr A McKIE REID

Despite the counter attraction of the International Congress of Ophthalmology the meeting of this section was exceptionally well attended

Radiation Light and Illumination

Mr J N ALDINGTON, PH D president of the Society of Illuminating Engineers remarked that the eye had evolved through many ages under continuous radiation from the sun The subjection of the eye to other sources of light might perhaps be thought to be associated with risks of damage, yet this had not proved to be so Up to about 1930 almost all light sources gave continuous radiation, now the sodium lamp was the most efficient of all the general illuminations in use Investigation had revealed no harmful radiation from fluorescent lamps Dr Aldington went on to cite several examples of the close relationship between ophthalmic research applied ophthalmology, and his own work on illumination

Colour vision in the Central Fovea—Great strides are being made in the study of colour-vision, and the processes of photo reception and of the mechanism of vision itself are coming to be better understood Since the publication of his book *Retinal Structure and Colour Vision* Mr E N WILLMER SCD, has continued his research work at Cambridge and at the meeting he reported some new observations on the colour vision of the central fovea

GERIATRICS

President Dr C O STALLYBRASS

Care of the Aged

The most significant thing which emerged from the section of geriatrics was the agreement among general practitioners that since the arrival of the National Health Service it has been harder to get an elderly patient into hospital Dr P Y LYLE of Southport, found that two thirds of his visiting list was composed of patients over sixty five City practitioners such as Dr A FRANKLIN, of Liverpool pointed out that this was chiefly an urban problem because there seemed to be many more idle, lonely and unwanted old people in the towns. Countrymen often continued with their accustomed work and play well into the seventies and eighties, thus avoiding the sudden break of passing from activity to lack of occupation on retirement from work. Many doctors thought that they were too busy to attend to their

threadworm, and *Trichinella spiralis* Infestation with the beeftape worm—*Tænia saginata*—might be on the increase, since measly beef was now more prevalent than before the war this was also the case in Denmark and elsewhere The reasons were uncertain The pork tapeworm—*T sodium*—disappeared from this country with the introduction of proper meat inspection, infested pigs usually had very large numbers of cysts which were readily seen The fish tapeworm had so far not been recorded indigenously in this country, though it occurred in Ireland

Dr C A HOARE said that infection with *Entamœba histolytica* involved a significant proportion (between 1 and 4 million) of the population of the British Isles, most infected persons did not suffer from clinical dysentery *E histolytica* could live either commensally or as a pathogen but the reason why it changed its habits was not clear There might be some non pathogenic strains of *E histolytica*, commonly associated with the production of small cysts The few indigenous cases of frank amœbic dysentery were probably the result of infection with pathogenic strains introduced from overseas Two great wars had not materially influenced the incidence of the infection in the British Isles In view of the possibility of the commensally living parasites becoming pathogenic it seemed wise to treat this infection

Dr E H VERE HODGE discussed the treatment of helminthiases in man No anthelmintic was surely effective, and before such a drug was given concomitant infections should be corrected In one case of strongyloidiasis, most encouraging results were obtained with methylene blue

Mr R B GRIFFITHS said that until lately infection of beef with *Cysticercus bovis* was thought to be rare in this country, but in the past two years it had become evident that the condition was now prevalent There was no real proof that *T saginata* infection in man had materially increased The recognition of gross infection of a carcass with *Cysticercus bovis* entailed the condemnation of the carcass In light infections the beef was treated by freezing, in order to kill the cysticerci before the meat was issued for consumption Infection from undetected light infection of beef could be avoided by cooking the meat Housewives might be infected by swallowing cysticerci adhering to the hands when preparing beef for cooking, and this might account for the fact that in women infection was four or five times as common as in men

Dr NAPIER said that in the U S A the infection rate with *Trichinella spiralis* was higher than in this country Light infections, which were not clinically obvious, might immunise against subsequent reinfection

Dr R C MAC KEITH described an infection of the conjunctiva of a child with *Enterobius vermicularis*, and he mentioned instances of abnormal location of this parasite in the fallopian tubes and elsewhere

Brigadier J S K BOYD said it had been established that in the recent Wolverhampton outbreak of trichinellosis uncooked meat in sausages was the source He thought that giardia infections were not invariably harmless, but that they might cause diarrhœa Tissue invasion by *E histolytica* might be precipitated not only by recognised pathogenic bacilli, such as shigella, but by such organisms as *Bact coli* which were not invariably pathogenic Dr VERE HODGE was firmly of the opinion that giardia could give rise to diarrhœa in children

Mr P L LE ROUX, D SC, discussed the helminthiases from the veterinary aspect, and stated that helminths might produce manifestations not solely by themselves but as agents for the introduction of various pathogenic bacteria He thought that closer integration of human and veterinary medicine and of the public health authorities would be a powerful factor in controlling parasitic infestations

Colonel W H HARGREAVES agreed that bacterial organisms could facilitate the invasion tissue of *E histolytica*, control of these organisms antibiotics would lessen the invasive tendencies of protozoan parasite Dr A R D ADAMS mentioned difficulties in the diagnosis of an *E histolytica* infec He was unable to differentiate between vegetative *E histolytica* and vegetative *E coli* on morphol he regarded sigmoidoscopy as of no great value in diagnosis of amœbiasis, since in mild attacks of amœbic dysentery no lesions might be seen, and he deplored use of the so called provocative emetine dosage, which had no justification either in theory or in practice

RADIOLOGY

President Dr J S FULTON

Some Aspects of Bronchiectasis

Dr J C H MACKENZIE pointed out that there are reported statistics of the incidence of bronchiectasis in community and went on to quote figures from the Leicester Isolation Hospital and Chest Unit The showed an incidence highest in children up to the age of 15—the greater proportion of them being females. The incidence in Leicester school children was 2 9 per 1000 but communities differ according to social factors, the efficiency of isolation of tuberculous parents from children and the efficiency of chemotherapeutics and antibiotics The main ætiological factors are, he thought, either mechanical or infective Congenital bronchiectasis though it may occur, is rare and so not important He quoted Lander and Davidson's work showing the traction forces within a collapsed segment produce dilatation of the bronchi, and Lander's later work suggesting that, in an incomplete bronchial stenosis the collapse is peripherally situated and the bronchus dilated, but that dilatation may also take place in complete obstruction, from secretory pressure

Dr Mackenzie regarded infection as the main ætiological factor and discussed infections producing dilatation of the bronchi under the headings of acute, subacute and chronic Acute destruction of lung tissue is seen in Friedlander's pneumonia, non specific suppurative pneumonitis, and certain virus diseases associated with secondary infection Subacute destructive changes take place in tuberculosis, when the upper lobes are usually involved, but most cases of bronchiectasis are due to chronic infection and begin with atelectasis of the lower lobes either from an inflammatory cause or from glandular pressure, particularly tuberculous hilar adenitis

Dr F WHITWELL said that in reviewing about 4 operation specimens of bronchiectatic lungs he found broadly speaking, three pathological types

The *follicular* type is seen in children, usually as a sequ to measles, whooping cough, or influenza, and is really a chronic interstitial pneumonic type Microscopically, the bronchi are thickened, the alveoli become solid, and there a surrounding chronic interstitial pneumonia Fib develops as a later stage following collapse

The *saccular* type, in which the dilatation of the bronchi greater occurs in older patients and does not seem to be related to previous illness It arises as a chronic mu bronchitis in which the larger bronchioles become thicke the smaller lateral bronchioles become obliterated, and the end result is an elongated sac which may become filled w pus This infection causes a dilatation and so the saccular formed

Atelectatic bronchiectasis occurs as a result of obstruction usually due to hilar adenitis causing blockage of the m bronchus and so collapse of the lung It is commonest on the right side and may revert to normal if the cause of the obstruction is removed If there is fibrosis, bronchiectatic changes will develop

Dr Whitwell found that nasal sinus infection is common sign in the follicular and saccular types but rarely seen in the atelectatic bronchiectasis

ie maximum resolution in relation to living tissues ed

A. S McFARLANE said that with electron micro resolution was far greater than with any other od the limits being in the region of 5–10mμ. Dr arlane referred to work on muscle structure, iatozoa the retinal rods and insect viruses illustrat- s remarks with a series of very fine lantern-slides

cal Pneumonia

a joint meeting with the section of medicine C H STUART HARRIS described the subject of cal pneumonia as confused Despite the apparent sity of causes, the cases were clinically similar eomycin' was sometimes effective, but its very l action called for well-controlled clinical trials if mation of value was to be obtained

of. S P BEDSON F.R.S recalled that psittacosis was the first causative agent of the group to be nised Severe cases of psittacosis were not at all atypical pneumonia, but mild cases were quite indis- ishable and psittacosis or ornithosis probably accoun or about 10–12% of all examples of the syndrome rate diagnosis was essentially a laboratory problem although ideally the virus should be isolated more lly diagnosis depended upon complement-fixation s The antigen prepared from the virus was common he LGV psittacosis group and consequently the test only group-specific results must therefore be rpreted in the light of the clinical findings Absorption eriments had shown that a specific reaction could be ained and heterogenous viruses excluded Such hods however, were not practicable for routine use fessor Bedson referred to the use of skin tests in the gnosis of infections of the psittacosis-ornithosis group l presented results which suggested that such tests ght have some practical value

Dr THOMAS ANDERSON presented a series of cases ich might have been labelled atypical pneumonia which were shown, on further investigation, to be mples of interlobar effusion tuberculosis, or lung cess He suggested that too great readiness to ign a case to the benign group of atypical pneumonias ght result in more serious disease being overlooked

Dr JANET NIVEN said that despite some broad ilarities, the various types of human infection differed m each other in detail. In material from a fatal e of Q fever it had been possible to demonstrate kettsia both intracellularly and extracellularly

Dr M. G. P STOKER gave a short account of Q fever Europe. In this disease due to a rickettsial infection gnosis, as with psittacosis depended upon the oratory a complement-fixation test being employed lation of the causative agent was again the ideal but s not easily achieved. Cold agglutinins were not ally present in high titre and the Weil-Felix reaction negative In the United Kingdom Q fever was nd in endemic foci in Kent, for instance, examina- n of sera from blood donors gave evidence of previous ction in 13 out of 80 whereas in a series of 200 sera n East Anglia no positive results were obtained endemic areas much of the raw milk could be shown contain the causative organism

nal Failure

Mr. R SHACKMAN, who referred particularly to post- rative renal failure affecting the normal kidney said t local vasodilatation or constriction of the glomerular rioles might play an important part in the response the kidneys to unfavourable conditions Severe ular failure left the patient in a condition almost ivalent to that after nephrectomy If such a patient ld be kept alive, the tubular cells regenerated. The nerated cells resembled infantile ones in that they e incapable of effectively concentrating the glomerular ate

Prof J H DIBLE showed a series of slides illustrating the pathology of tubular damage in renal failure In tubular failure the earliest changes were at present ill defined, since little material from such cases had been available for study Broadly, the histological appearance in tubular necrosis could be classified according to the presence or absence of pigment Such a division reflected the ætiology for example cases arising after intra- vascular hæmolysis showed this pigmentation, whereas renal failure cases following surgical shock or severe burns did not

Dr E M DARMADY said that despite the clinical and histological similarity of cases showing this syndrome, there were about seven possible ætiological groups into which they might fall These were (1) surgical shock (2) disturbance of water or electrolyte balance, (3) hæmolysis (4) allergy (5) chemical nephrotoxins (6) infection general or local and (7) obstetric When more than one of these causes was operative the prognosis was correspondingly poorer

Dr G M BULL analysed 50 cases of acute tubular necrosis of varying ætiology with special reference to effective treatment Renal failure of the tubular type showed four stages First there was the onset, when the damage was initiated Here the urine volume fell rapidly and the blood urea rose This soon passed into the second phase of oliguria or anuria where tubular damage was maximal and renal blood flow was reduced In the past most deaths in this phase had resulted from the administration of excessive amounts of water It was vital that the fluid intake should exactly balance the insensible loss—it should be exactly 1 litre plus the volume of any urine secreted. A mineral free and protein free diet should be given and the necessary high caloric value should be provided by carbohydrates and fats. Diuretics were useless at this stage and could do nothing but harm The third and fourth stages were the early and late diuretic and corresponded with tubular regeneration Here there was a return of urine flow with at first very poor tubular function The urine was an almost unaltered glomerular filtrate Thus there was a great loss of essential substances, and in particular water and salt This loss must be made good Potassium loss was less severe and might be readily overcome by the use of a diet providing plenty of fruit The diuretic phase lasted, as a rule for the same period as the preceding anuria

In opening the *Pathological Museum*, Professor SHEEHAN made one of the briefest speeches of the entire meeting All credit for the arrangement of the museum should he said, go to Dr R C Nairn and other members of the pathology department and he added that it had taken him four hours to go round the museum

The exhibits were placed in nine groups usually representing the special branches. The pædiatric section contained demonstrations of congenital abnormalities of the newborn and of infants and a fine series of colour photographs. The gynæcological and obstetrical section included a series of specimens illustrating radical surgical procedures, and an exhibit of the modern classification of pelvic types. The neurology section presented a series of pots in the classical style set against a mural scheme of electro-encephalograms. A combined bacteriological and pædiatric demonstration dealt with the clinical and laboratory aspects of toxoplasmosis in a way that would prevent anyone from regarding the problem as being academic and unimportant In the section of orthopædic surgery a demonstration of skeletal abnormalities induced in the developing chick embryo by the injection of insulin aroused considerable interest. The surgical section besides some uncommon surgical conditions and recent operative procedures had a demonstration of hydronephrosis induced in rats Pathology and bacteriology in a combined exhibition showed several series of teaching specimens amongst which that on bone pathology was perhaps outstanding Research in progress was also illustrated.

(to be concluded)

older patients properly at home They wanted more help and advice from consultants, which was often not available except in certain areas They lacked facilities for physiotherapy which would allow rehabilitation after illness, adequate treatment of chronic rheumatic disease, and proper management of patients with a hemiplegia This last point was heavily underlined by a film which Dr MARJORY WARREN showed, demonstrating the technique she has evolved for dealing with such cases While simple to carry out in hospital, it would be most time consuming for any general practitioner on his daily round Another lack felt was the need for a pathological service outside hospitals, so that blood counts and other simple tests could be carried out on domiciliary visits

There was also considerable agreement among those who have to care for elderly patients in hospital Dr C T ANDREWS, of Truro, produced statistics showing the increasing number of old people needing the hospital services of Cornwall On one day recently, over 40% of the hospital cases in his area were over sixty years of age When the district nursing services were investigated, half the visits were paid to patients in this age group These figures were very similar to those produced by Dr W E FITZGERALD, M O H for Southport, under whose auspices a determined effort has been made to produce a coordinated geriatric service for the town Clubs, clinics, social welfare activities, and hospital beds are being closely linked in a promising attempt to meet the needs of the old folk who are a peculiar problem in such seaside areas The importance of such a linkage between hospital services, welfare authorities, and the general practitioners was stressed by several speakers, and in particular by Dr E B BROOKE, of Carshalton In his opinion, the centre of gravity in geriatrics was the home of the patient and not the hospital unit The family doctor must steer the ship, aided and abetted by the physician to the elderly, the district nurse, the home help, and welfare workers Before admission to hospital of any old person there should be a medical and social assessment of his needs Otherwise beds would be blocked by cases which could be nursed at home This practice, which is in operation at Bradford, should also be amplified by the organisation of outpatient clinics Thus, and thus only, can be avoided the long, meaningless waiting list, which the practitioner dreads Geriatrics is essentially team work, not merely another specialty in medicine Unless the family doctor is a member of the team, both in hospital wards as well as in the homes of his patients, those patients will suffer In country districts, the cottage hospitals could play a larger part in the care of old people than they do There is need for central geriatric units to create a ring of subsidiary wards and clinics around them in order to serve the old folk effectively, and to help the family doctors more than they do at present

Diagnosis and Treatment

But it is not enough to ease the burden of harassed relatives by admitting the aged sick to hospital at an earlier stage of their illnesses It is necessary to provide better methods of diagnosis and treatment for those who present themselves This was the theme of Dr LOUIS CARP, of the Goldwater Memorial Hospital in New York In a most inspiring address on surgical treatment of elderly patients, he stressed again and again the difference of mortality between emergency operations and those of election Quoting statistics from several clinics, he demonstrated how preoperative correction of anæmia nitrogen imbalance, and fluid lack paid dividends Improved methods of anæsthesia and the right psychological approach to the patient also cut down mortality very appreciably Apart from his wide technical scope, Dr Carp was of great service to those attending the meetings of this section by telling them of the developments in the United States, especially on the care of those suffering from mental changes in old age His that Britain led the world in geriatrics came as a tribute to his hosts

The clinical and pathological themes were dev by Dr VISCHER, of Basle, who referred to the of necropsy on a series of 1826 cases from his and by Dr HIRSCH, of Brussels, who discuss problems of arterial disease in the aged Both authorities thought that arteriosclerosis was the cause of a shortened life span and "the scourge of temporary humanity" Degenerative pulmonary in the aged with pulmonary fibrosis was the dearest to the heart of Dr ROBERT EVANS, of Live Prevention and early treatment by antibiotics antispasmodics could do much to reduce the mor in this group of complaints As in other patholo conditions of old people, it was delay and half hea therapy which produced infirmity to fill hospital with chronic cases These were too frail for their relat to accept back home with open arms, even after recovery Unless more hostels were forthcoming receive these patients, they would create a pro which might conceivably upset both hospital and gener practice aspects of the National Health Service. He early diagnosis, prompt treatment, coöperation general practitioner and consultant, and coördination nursing and welfare services with the hospital facili are all essential this was the unanimous verdict

PATHOLOGY AND BACTERIOLOGY

President Prof H L SHEEHAN

Recent Advances with New Methods of Microscopy

Dr ROBERT BARER, who opened this sympos said that when using simple lens systems to exam unstained living tissue, very little fine detail could be made out, owing to the transparency of the tissue This difficulty could in some measure be overcome by using ultraviolet light, but further complications at once arose, for microscopes designed for use with ultra violet light required special lenses of quartz or fluorite and these had certain inherent disadvantages. Achromatic lenses made to satisfy these conditions could corrected for only a single wave length, and there was difficulty in focusing the image A mirror unlike a lens, was free from chromatic aberration This illustrated one of the advantages of the reflecti microscope, the magnifying system of which consists entirely of mirrors so that an object focused with visi light would remain in focus for ultraviolet light further advantage was the greatly increased distance, compared with optical microscopes, giv the same final magnification In a purely reflecti microscope the mirrors must be, not spherical, but of more complex curvature, but spherical mirrors co be used successfully in a system which embodied pa reflecting and partly refracting principles Micros of this type had been adapted to provide a mean investigating the ultraviolet absorption patterns of objects such as minute crystals and single cells. T method could provide valuable information about disposition of the chemical constituents of cells. Furth modification of the same instrument, using a differe recording system, enabled analysis to be carried out at t infra red end of the spectrum The absorption patte produced in this region, while very complicated, w also very characteristic, they were the "fingerprint the molecules"

Dr A F HUGHES showed a time lapse cine f illustrating the appearance of various cells in t culture Films of this type emphasise dramatically limitations of knowledge of the living cell

Mr R KING speaking in place of Mr S SMIT observed that by ultraviolet light the potential resolv power of the microscope could be approximately doub

DISCUSSIONS

the Sympathetic Nervous System in the Genesis of ar Hypertension and its Effect upon the Eye

F H ADLER (Philadelphia), the opening speaker l out the need to identify the main factor respon or that peripheral vasoconstriction which is so ntly associated with hypertension Theoretically libre of the vessels might be narrowed by nervous es acting upon their walls whether directly or tue of some chemical activator Such a substance alternatively produce its effect through the iediation of the medullary centre It would appear humoral substance influencing the actual vessel affords the most reasonable explanation The on then arises why we should ever expect sympa mv to alleviate hypertensive damage According ofessor Adler, relief is attained through a flattening "pressure peaks" When the average level of ire is abnormally high, a relatively slight change e cardiovascular adjustment may precipitate a during which the retina may suffer damage, or ps a fatal outcome may ensue High *average* ire levels may be tolerated unexpectedly well, but n increments are dangerous

S SCHIFF-WERTHEIMER (Paris) drew attention to umber and variety of the influences jointly respon for regulating the pressure level The endocrine m, with all its intricate interaction, is a factor ult to assess and apt to be neglected Ophthalmo y often enables us to differentiate between the ssible and irreversible phases of hypertension, but tailed prognosis cannot properly be given on the of fundus findings alone

r HEDLEY ATKINS emphasised that hypertension become almost as great a scourge as cancer He rds the retinal changes of malignant hypertension n earnest of essentially similar processes afflicting idneys With regard to the rival operative methods, Atkins came out in favour of the Smithwick pro ire and he emphasised how much the symptoms be alleviated in wisely chosen cases not over the of 55 years Relief of headache is perhaps the most king benefit, even among those patients who fail to ibit any lasting fall in the blood pressure after ration

r A J BEDELL (U S A) deprecated the use of the ming adjective ' malignant" in describing severe ances of the disease He prefers to designate them fulminating' cases Dr L S TASSMAN (U S A) erlined the importance of emotion, and Dr P LLIART (Paris) emphasised that fragility and per bility of the vessel walls were of greater significance i the vascular calibre

ical and Social Aspects of Heredity in Ophthalmology

ais discussion was opened by Prof LAURENCE H DER (U S.A.), Miss IDA MANN (Australia) and Prof 'PANCESCHETTI (Geneva) Professor FRANCESCHETTI ribed researches pursued with the help of D KLEIN, 'ORNI, and J BABEL upon neuro-ophthalmological corneal inherited diseases Professor SNYDER spoke ie overlapping of heredity with environment in the uction of various ocular defects Miss MANN des d some of her animal experiments and emphasised many cases of inherited disease could be prevented neans of frank individual explanation to married les contemplating parenthood

OTHER FUNCTIONS

i Sunday July 16, Professor NORDENSON laid a th on the memorial tablet to Sir William Bowman at ames s Church Piccadilly

To us in Britain, said Sir STEWART DUKE ELDER nan was in every sense the founder of our special branch fgery, just as he was the first president of our Ophthalmological Society But renowned as he was throughout the world as a scientist who made immense contributions to our knowledge, respected as a surgeon a physician, and a teacher unequalled in this country in his time he is remembered still far beyond the boundaries of this country, for his kindliness his sincerity and the warmth of his personality '

On July 18 Mr Aneurin Bevan Minister of Health, received congress visitors at the Tate Gallery on behalf of the Government Receptions were also given by the Royal College of Surgeons, the British Medical Association, and the Royal Society of Medicine Sir Cecil Wakeley, F R C S conferred honorary fellowship of the Royal College of Surgeons on Dr Bailliart and Dr Derrick T Vail (Chicago) Dr A J Ballantyne (Glasgow) received the Nettleship medal from Mr Maurice Whiting president of the Ophthalmological Society of the United Kingdom

At the official banquet of the congress, held on July 20 there were nearly a thousand diners, and the chief guests were Mr LEWIS W DOUGLAS, the American ambassador and Mrs Douglas

In his closing speech to the congress Professor NORDENSON spoke warmly of its success, and said that the venue of the 1954 congress would be decided later Brief speeches were also made by representatives from the various continents—Prof L GUGLIANETTI (Europe) Dr G STUART RAMSAY (North America), Prof M E ALVARO (South America) Dr N F AYBERK (Asia), Dr R C J MEYER (Africa), and Dr W J HOPE-ROBERTSON (Australasia) Sir STEWART DUKE ELDER thanked all his helpers, and particularly Mr Frank Law the secretary general He assured the guests of his delight at their presence and his eager anticipation of seeing them again in 1954 if not before

Special Articles

ECONOMY IN DRUGS AND DRESSINGS

Sir John Charles, as chief medical officer of the Ministry of Health, has addressed a personal letter to members of the staffs of hospitals,[1] in which he quotes the following observations made by the medical advisory council of the Liverpool Regional Hospital Board

X ray Films—In view of the high and increasing costs of films both for inpatients and outpatients economies should be sought wherever possible and particularly in

i *Serial films*
ii *Barium meals* Medical staff should specify in which cases it is unnecessary to continue after say six hours (The cost of films for barium meals ordinarily varies from 10*s* to 25*s* according to the number used)
iii *Tomograms* Medical staff should suggest which layers are essential and which are probably unnecessary (Cost of a set of 8 tomograms 12 × 15 in is 21*s*)
iv *Pyelograms* (Cost of dye for an intravenous pyelogram is 5*s*)

It is also recommended that all requests for films by house officers except in emergencies should be countersigned by a registrar

Investigations—It would appear that there is considerable scope for economy by restricting investigations to those the results of which seem likely to influence the treatment of and so be of ultimate benefit to the patient

Drugs—(1) The tendency for expensive drugs to be used empirically and for several such drugs to be combined on the chance that one or other may be of value should be avoided. (2) There is considerable scope for saving in such drugs as penicillin and other antibiotics These drugs should be given only where there is a clear indication for their use, and in such cases the dosage should be carefully considered and frequently reviewed, preferably by senior members of the hospital medical staff. All cancellation of treatments should be made on the treatment sheet and notified to the pharmaceutical department immediately (Cost of penicillin is 4*s* 4*d* per mega unit Cost of streptomycin is 4*s* per gramme) (3) The extravagant use of vitamins and stimulants which are too often given as a routine, should be avoided

1 It was incorrectly stated last week (p 147) that hospital doctors were receiving the same letter as general practitioners

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY

A MESSAGE of encouragement from the King and Queen, patrons of the Congress, was read by the Duke of GLOUCESTER when he opened the 16th International Congress of Ophthalmology in London on July 17 More than a thousand members, together with several hundreds of associates from 64 different countries, converged on London for this memorable week of activity The assembly was addressed by Prof J W NORDENSON (Stockholm) president of the International Council of Ophthalmology, who has now been succeeded by Sir STEWART DUKE ELDER, chairman of this Inaugural addresses were also given by the fi representatives of different continents Dr E HARTMANN (Europe), Dr JOHN H DUNNINGTON America), Prof R ARGAÑARAZ (South Ameri JAMSHEDJI DUGGAN (Asia), Dr ABDEL FATTA TOGBY (Africa), and Dr J RINGLAND (Australasia) Dr H Arruga (Barcelona) then the Gonin medal from Professor Nordenson, by of his eminent services to ophthalmology

PRESIDENTIAL SPEECH

Sir STEWART DUKE ELDER said that modern ophthalmic surgery dates from the achievement of Jacob Daviel, oculist to Louis XV, who introduced his operation for cataract in 1747 and communicated his method to the Academy in Paris in 1752 But if modern ophthalmic surgery is approximately 200 years old, 1950 marks the centenary of ophthalmology as an independent specialty, for on Dec 6, 1850, Hermann von Helmholtz first demonstrated his ophthalmoscope to the Physical Society of Berlin It is true that three years previously, in 1847, Charles Babbage, an English mathematician—one of whose other claims to fame is that he invented the first calculating machine—invented a similar and indeed more efficient instrument But since Babbage allowed his ophthalmoscope to lie in his desk for seven years, to Helmholtz must go the honour of revealing to the world the mysteries of the inner eye and of making ophthalmology an exact science

Of course the discovery of the ophthalmoscope did not in itself revolutionise ophthalmology we must look upon Helmholtz's achievement in its proper setting For the decade centred upon 1850 was the most productive and the most exciting in the whole history of medicine Charles Darwin, Claude Bernard, Carl Ludwig, Virchow, Bright, Addison, Pasteur, Lister, Morton, and Simpson in 1847 were contributing their new ideas, and the whole edifice of medieval medicine was going up in flames

In ophthalmology the new world opened by Helmholtz was explored with enthusiastic zeal, and the first decade saw the work of Bowman and others on the minute anatomy of the eye, of Donders on refraction and the prescribing of spectacles, and of a host of others on new techniques in surgery

> "In the hundred years which have followed, I think it can be said that we have been reaping the fruitful harvest of this prodigal sowing consolidating and expanding, but adding little that is fundamentally new The only great revolutionary concept that has been added to the techniques of surgery is the treatment of detachment of the retina by Jules Gonin"

For further advances, new techniques are needed

> 'I think it may be that we are starting a completely new chapter and entering upon another revolution We do not yet have the background or perspective to say whether this resurgence of medical thought is related to a more widespread and general stirring of the human spirit among the nations, but it coincides with a time when the material power in the hands of man has seen the prodigious revolution of atomic energy From the structural point of view, instead of Virchow's microscope, we are now equipped with the electron microscope, which is opening out a new and more intimate universe within the cell From the functional point of view we can follow metabolic processes with radioactive elements through all the intricacies of metabolism The age of biophysics and biochemistry has dawned and instead of merely describing and mourning over the structural ruins which disease has left behind it, the change in outlook today, as I see it is to probe more deeply, to examine the more subtle nature of the initial defect, to pass from cellular path intracellular chemistry"

Ophthalmology, said the President, is leaving its century of adolescence and is entering its second its adult life, when it can begin to formulate an integrative philosophy based on a knowledge of first principles of health and disease

SCIENTIFIC PROGRAMME

A series of visits to Edinburgh, Glasgow, and var provincial teaching centres in England was arrange parties of visiting ophthalmologists during the w immediately preceding the congress The week of t congress itself demanded unceasing activity on the of those who wished to avail themselves of the ophthal logical feast Three concurrent sessions, whose num increased to five on one occasion, were needed in o to permit the delivery of more than 140 communicat exclusive of the opening papers for the two main cussions Numerous physiological and patholo demonstrations were staged at the Institute of Ophthalm logy, whose main departments were open to inspect throughout the week The programme also includ over 60 ophthalmological films, operative sessions, a demonstrations in radiotherapy, physiotherapy, colo television for surgery, and orthoptic methods The lat devices for fitting of artificial eyes and of contact glas were also displayed

Elaborate preparations had been made to assem material for a series of museums, so that it was poss to see, separated by distances of only a few yard wealth of clinicopathological items, including first-c histological specimens, coloured fundus photogra case records, and investigatory devices One exhibi was devoted to the principles of illumination, on historical books, and another to the evolution of specta and surgical instruments, together with various o objects of historical interest The exhibition dealing social and industrial ophthalmology contained a ma carefully sifted information about miner's nystag and a wide range of protective devices for wor dangerous occupations

The work of St Dunstan's and of other organis concerned with the welfare and rehabilitation of b people was carefully set forth Gone are the days loss of sight limited the victim to a few monoto tasks Granted the necessary training and encour ment, blind people can make their choice from enormous range of skilled occupations Indeed are numerous important jobs for which they greater aptitude than the average possessor of no sight

Ample space for all these exhibitions was avail at the London School of Hygiene and Tropical Medi and the Wellcome Medical Foundation At St Pan Town Hall there was an attractively organised dis of books, drugs and surgical and ophthalmolo instruments

In England Now

Witty Commentary by Peripatetic Correspondents

Boycott used to say that of all men histologists are most idle They sit on tall stools they puff pipes and they twiddle the handles of their micro- Do they meditate on the function of the neuroglia, innerness of Bielchowsky's stain or on their of a legacy from Aunt Agatha? Or do perhaps mes of xylol induce dreams of houris in robes with rose bengale and alizarine? Our vistas of the iscious are few and far between and these are ons whose answers we never hoped to learn We herefore an extraordinary debt to the American who has printed a translation[1] of an apologia from on of the late Pio del Rio Hortega, down of those ollowed Ramon y Cajal What de Quincey did e victims of the poppy this Spanish savant r the devotees of the stain pots the foetid imbed- ven, and the sacrificial razor He made no bones it, the histologist is a creative artist That his may have "useful results that he may establish hing which will pro tem pass as a working hesis for 'truth' does not influence his claim cannot be a virtuoso of histology without being former Every still unsolved problem of biology asically a technical one, and he who delegates work to the technician seldom devises a new nique He who devises no new technique rarely nces the science which he professes And the reward e true histologist lies in the creation of nous mulacrum of an entrancing reality unseen by any previous eye That person has not the makings of a histologist, after being stirred emotionally before a perfect oscopic picture does not look for someone of a lar sensibility with whom to share it like a child fully showing his new toy Thus did Hortega lift rner of the curtain and we wonder at our past dness Histology is a cult which binds a secret herhood. Looking at our colleagues we recognise indoctrinati and the neophytes. Is that pink stain he left forefinger an initiation mark? They have ples. redolent of paraffin wax and strong tobacco e's which the curious may learn in 'Bolles Lee a language entirely of their own Montague James told some stories which should warn us against uisitive prying into the mysteries young men should ink twice or more before they take the plunge The estigator's spirit burns, without being consumed in amp of three flames the many-coloured flame of stic sensibility, the bright white flame of eagerness discover new truths and the blue flame whose tex soars upwards and seeks eternity' We would ise those who have any doubts to stick to a rocker rotome and "H and E.'

* * *

t was late afternoon and the last few donors were ig bled on couches by the windows which overlook old Roman bath. The concert-room rose high above, ighteenth-century magnificence, outside, the rain- n faces of the Roman Emperors gazed in stony martial entry across the bath in which the goldfish swam v below, for it was a warm spring day at the end March, which, very correctly, was going out like a b

t length, all was done The swing doors had swung ind the last folded stretcher as it was carried out to packed in the lumbersome three-ton lorry which had ted outside through the hot afternoon The doors amed and the great vehicle roared as it moved slowly y from the doors of the Bath Room P-mp (Your ion, madam, the Pump Room B-th) The lady er, with the male orderly seated beside her, elected convenience to drive out under an old arch on to the n street, and not to turn back by the way she had ered earlier in the day As Leviathan approached the it became apparent that clearance at the roof if e were any, would be slight Lorry and arch drew rer, and lorry edged underneath The male orderly gazed aloft with soft anxious eyes All was well the balmy air of B-th filled a clear nine inches between the respective roofs Yet *subito!* a sudden jarring crash stopped the triumphal advance The orderly looked up expectantly awaiting the fall of masonry, but to his surprise the arch was further away than before But alas the gain above had sadly been offset by a subsidence below and looking behind he saw the wheels up to their axles in Roman pavement

On either side of the area were shops with cellars below In one of the cellars an old man storing merchandise was surprised at the sudden fall of light followed by a pair of lorry wheels A crowd of B-thers (B-thomans? B-lneans?) gathered and also a superintendent of police the city engineer a breakdown team another breakdown team and then reporters and a photographer from the local press Here the orderly (to whom Kipling would have warmed because he was a man of considerable resource and sagacity and for all I know, best beloved suspenders) showed himself equal to the occasion. He held a quick press conference at which he stressed the need for blood and made a moving appeal for more donors Meanwhile the first breakdown team had done considerable damage and there was danger of the shops on either side collapsing Breakdown team no 2 had a go

A dance had been arranged in the Pump Room that night and people began to arrive for it The dance committee canvassed the crowd of many hundreds that surrounded the lorry and so successfully that all the tickets were sold and the B-th Cycling Club looked like having the most successful and remunerative dance of its long existence As a mark of gratitude all the members of the blood transfusion service were invited in and given a free supper

Late that night the second breakdown team got our poor lorry out and it drove off leaving behind it a couple of hundred pounds worth of damage, and a B-th which sorely needed a plug

And so to bed

* * *

The derationing of petrol seems not to have increased the accident-rate in our parts but what has struck me very forcibly of late is the danger of attending school No fewer than six little boys in today's fracture clinic had been injured while pursuing their lawful occupation —pushed off walls, trodden on by bigger boys or (shameful to say) hit by a stone thrown by a girl P T too claimed some victims True there were a few odd grown-ups who had dropped billets on their toes in the steelworks or caught their leg between tubs down the pit but 6 schoolboys out of the 20 new patients shows that school is definitely a hazardous occupation And there is no question with them of compensation or sickness benefit—not even of wanting a doctor's note Just a curt remark from the orthopædic registrar that an arm in plaster does not prevent one from using one's head, and back they go to their life of trial and tribulation.

* * *

Lines inspired by Dr G Catherine Evans's speech at Southport

The Cons and the Specs
Draw whacking great cheques,
Mr Chairman. Let's not pity *those*
It's the poor old G.P.s
Who get the hard cheese
And the hardworking Shmos and Jhos

Those emergency jobs
Aren't all done by the nobs.
Where are they at weekends? God knows.
And who fills the gaps?
Why the G.P.s. poor saps
And the downtrodden Shmos and Jhos

Some think Mr Newell
A regular jewel
I can't say that I'm one of those
It's the lonely G.P
Who is my cup of tea,
And the put-upon Shmos and Jhos.

1. *Texas Rep Biol Med* 1949 7 363

Referring to the use of proprietary preparations, Sir John Charles suggests that, save in exceptional cases, doctors should seriously consider, before ordering a proprietary preparation, whether the alternative standard drug could not be ordered without detriment to the patient's condition "At consultative clinics it is desirable that drugs prescribed should be according to the *National Formulary* where comparable, since prescriptions issuing thence must often become almost obligatory on the general practitioner when the patient returns to his care"

"None of us," he adds, "will wish to cause the Health Service to cost more than is necessary I shall greatly value your help in effecting in this field the substantial economies we believe to be possible"

Parliament

The Medical Bill

IN committee in the House of Commons on July 18, debate continued on Dr CHARLES HILL's amendment to secure that any complaint referred to the penal cases committee of the General Medical Council must be supported by a statutory declaration A practice had lately grown up, Dr Hill said, under which the Ministry of Health sent certain papers to the G.M C but did not put in any statement of complaint For example, a case had recently been heard by the National Health Service tribunal and the practitioner found not guilty, after which the Ministry of Health sent the papers to the G M C in case they were interested The point of his amendment was that a Government department should not be freed from the obligation of appearing and making a complaint, and being questioned about it, any more than anyone else

Mr ANEURIN BEVAN said he was now prepared to give an assurance that, where a doctor had been acquitted by the tribunal set up under the National Health Service Act, the Ministry would not send the papers to the council However, he must make it clear that the decisions of the tribunal were published, and that the G M C might take cognisance of them and might start proceedings themselves If in such a case they asked for the papers, these would have to be supplied

In view of the Minister's assurance the amendment was withdrawn

Lieut Colonel WALTER ELLIOT moved an amendment with the object of discussing with the Minister a point arising out of the Spackman case Under the Bill, a finding in a High Court or Court of Session of the United Kingdom or the Republic of Ireland that a practitioner had been guilty of adultery with a certain person was to be taken as conclusive Colonel Elliot agreed that much could be said for the argument that the G M C should not re try a case, but nevertheless new facts might become evident in a hearing before the council Secondly, why should this ruling apply only to cases where a doctor had been found guilty of adultery? Surely there were other offences of which he might be judged guilty involving the stigma of infamous conduct in a professional respect, such as slander or a bastardy order In the past it had been held that an investigation held in the courts for one purpose should not be taken as more than prima-facie evidence that there was a case for inquiry before another court

Mr BEVAN thought it was generally agreed that it would be quite wrong for the G M C to re try a case which had already been tried by a court of high standing Therefore it could be taken for granted that in the case of adultery the decisions of the court would be accepted by the G M C But in other cases—e g, the case of an affiliation order—the G M C might feel that it was open to them to reconsider the decision

After a lengthy debate Mr Bevan eventually agreed to look at the matter again But he said it must not be inferred that the language of the sub section could be altered

Mr RICHARD FORT moved that the period which a doctor could lodge his appeal to the Council should be increased from 28 days to 3 Mr BEVAN said he could not accept an which would allow a medical man to continue to for 3 months after the gravest doubts had been as to his professional capacity The medical societies and the B M A. had suggested 21 amendment was negatived without a division

VISITORS OF MEDICAL SCHOOLS

Mr I J PITMAN moved an amendment from inspection any place of instruction which the direction of any body which at any time d preceding six years had received a grant from funds through the University Grants Committee procedure proposed in the Bill was, he said, principle, and unwise, because it divided resp between the universities and the G M C The to medical schools would be inspectors ther inspect the qualifications and ability of the staff t the curriculum, and hours of teaching, and even part methods of instruction Did the G M C really take this responsibility? The best method w visiting committee which was invited into the univ by the teaching university

Mr BEVAN said he was surprised to see this amend for the provisions in the Bill followed the tions of the Goodenough Committee So far as he k they had received the unanimous support of the univ authorities, at least no objection to them had raised If the G M C inspections were vexatious to university authorities, they could make representa to the Privy Council to alter the directions He certainly inquire whether the universities were about this matter, but he could not promise that substantial alterations could be made to the clause

The committee stage was concluded

QUESTION TIME

Analgesia in Childbirth

Mr PETER THORNEYCROFT asked the Secretary of St for Scotland how many domiciliary confinements in Glasgow area during 1949 were attended by midwives on and in how many of such cases gas and-air analgesia administered for the purpose of relieving pain—Mr H McNEIL replied In Glasgow 4690 domiciliary confinem were attended by midwives alone during 1949, and in of these was gas and air analgesia administered

Mr THORNEYCROFT asked how many gas-and-air mach were available in Glasgow on Dec 31, 1949, and how m of such machines were on order at that date—Mr McN replied None for domiciliary midwives was available order at Dec 31, 1949 since then 6 machines have be available and 24 more are on order

Mr THORNEYCROFT asked why, during the year 194 woman confined in her own home and attended only midwife received gas-and air analgesia in Berwick, Lothian, Kincardine, Kirkcudbright, Midlothian, Or Peebles, Roxburgh, West Lothian, Zetland, Clyde Coatbridge, Dunfermline, Falkirk, Glasgow, Hamilton caldy, and Rutherglen and what action he proposed to remedy this situation—Mr McNEIL replied in each area was either that the necessary arrangem the training of the midwives were not far enough adv or that gas and air machines were not available I asked the local health authorities in all these areas speed review the position as quickly as possible

Tuberculosis Patients in Swiss Sanatoria

Mr D T LLEWELLYN asked the Minister of Health wh he was aware that there were at present 1000 beds in Swiss sanatoria that there are 8000 notified cas tuberculosis in Great Britain waiting for proper tre and therefore spreading infection, that the cost of tre in sanatoria need not exceed a basic 30s a day, and wh he would now make sufficient currency available in c tation with the Chancellor of the Exchequer, with to enabling tuberculous patients to fill empty beds in sanatoria—Mr ARTHUR BLENKINSOP, parliamentary se to the Ministry of Health replied There is no pos provide or pay for treatment under the National H Service Act outside this country

In England Now

ning Commentary by Peripatetic Correspondents

Boycott used to say that of all men histologists ie most idle They sit on tall stools, they puff pes, and they twiddle the handles of their micro- Do they meditate on the function of the neuroglia, innerness of Bielchowsky's stain, or on their of a legacy from Aunt Agatha? Or do, perhaps, mes of xylol induce dreams of houris in robes ith rose bengale and alizarine? Our vistas of the scious are few and far between, and these are ons whose answers we never hoped to learn We erefore an extraordinary debt to the American who has printed a translation[1] of an apologia from n of the late Pio del Rio Hortega, doyen of those ollowed Ramon y Cajal What de Quincey did e victims of the poppy this Spanish savant the devotees of the stain pots, the fœtid imbed- ven, and the sacrificial razor He made no bones it, the histologist is a creative artist That his may have "useful" results, that he may establish hing which will, pro tem, pass as a working hesis for "truth," does not influence his claim cannot be a virtuoso of histology without being former" Every still unsolved problem of biology isically a technical one, and he who delegates iwork to the technician seldom devises a new nique He who devises no new technique rarely nces the science which he professes And the reward e true histologist lies in the creation of no simulacrum of an entrancing reality, unseen by any previous eye That person has not the makings of a histologist after being stirred emotionally before a perfect oscopic picture, does not look for someone of a lar sensibility with whom to share it, like a child fully showing his new toy" Thus did Hortega lift orner of the curtain and we wonder at our past iness Histology is a cult which binds a secret herhood Looking at our colleagues we recognise indoctrinati and the neophytes Is that pink stain he left forefinger an initiation mark? They have ples, redolent of paraffin wax and strong tobacco, ets which the curious may learn in "Bolles Lee," a language entirely of their own Montague James told some stories which should warn us against uisitive prying into the mysteries, young men should nk twice or more before they take the plunge "The estigator's spirit burns, without being consumed, in amp of three flames the many coloured flame of stic sensibility, the bright white flame of eagerness discover new truths, and the blue flame whose tex soars upwards and seeks eternity" We would ise those who have any doubts to stick to a rocker rotome and "H and E"

* * *

t was late afternoon, and the last few donors were ig bled on couches by the windows which overlook old Roman bath The concert-room rose high above, ighteenth-century magnificence, outside, the rain- n faces of the Roman Emperors gazed in stony martial erity across the bath in which the goldfish swam y below, for it was a warm spring day at the end March, which, very correctly, was going out like a b

t length, all was done The swing doors had swung ind the last folded stretcher as it was carried out to packed in the lumbersome three-ton lorry which had ted outside through the hot afternoon The doors amed, and the great vehicle roared as it moved slowly y from the doors of the Bath Room, P–mp (Your ion, madam, the Pump Room, B–th) The lady er, with the male orderly seated beside her, elected convenience to drive out under an old arch on to the n street, and not to turn back by the way she had ered earlier in the day As Leviathan approached the it became apparent that clearance at the roof, if e were any, would be slight Lorry and arch drew ter, and lorry edged underneath The male orderly gazed aloft with soft anxious eyes All was well, the balmy air of B–th filled a clear nine inches between the respective roofs Yet *subito!* a sudden jarring crash stopped the triumphal advance The orderly looked up expectantly, awaiting the fall of masonry, but to his surprise the arch was further away than before But alas, the gain above had sadly been offset by a subsidence below, and, looking behind, he saw the wheels up to their axles in Roman pavement

On either side of the arch were shops, with cellars below In one of the cellars an old man storing merchandise was surprised at the sudden fall of light, followed by a pair of lorry wheels A crowd of B–thers (B–thonians? B–lneans?) gathered, and also a superintendent of police, the city engineer, a breakdown team, another breakdown team, and then reporters and a photographer from the local press Here the orderly (to whom Kipling would have warmed because he was a man of considerable resource and sagacity and for all *I* know, best beloved, suspenders) showed himself equal to the occasion He held a quick press conference at which he stressed the need for blood, and made a moving appeal for more donors Meanwhile, the first breakdown team had done considerable damage, and there was danger of the shops on either side collapsing Breakdown team no 2 had a go

A dance had been arranged in the Pump Room that night, and people began to arrive for it The dance committee canvassed the crowd of many hundreds that surrounded the lorry, and so successfully that all the tickets were sold and the B–th Cycling Club looked like having the most successful and remunerative dance of its long existence As a mark of gratitude all the members of the blood transfusion service were invited in and given a free supper

Late that night the second breakdown team got our poor lorry out, and it drove off, leaving behind it a couple of hundred pounds worth of damage, and a B–th which sorely needed a plug

And so to bed

* * *

The derationing of petrol seems not to have increased the accident rate in our parts, but what has struck me very forcibly of late is the danger of attending school No fewer than six little boys in today's fracture clinic had been injured while pursuing their lawful occupation —pushed off walls, trodden on by bigger boys, or (shameful to say) hit by a stone thrown by a girl P T, too, claimed some victims True, there were a few odd grown ups who had dropped billets on their toes in the steelworks or caught their leg between tubs down the pit, but 6 schoolboys out of the 20 new patients shows that school is definitely a hazardous occupation And there is no question with them of compensation or sickness benefit—not even of wanting a doctor's note Just a curt remark from the orthopædic registrar that an arm in plaster does not prevent one from using one's head, and back they go to their life of trial and tribulation

* * *

Lines inspired by Dr G Catherine Evans's speech at Southport

The Cons and the Specs
Draw whacking great cheques,
Mr Chairman. Let's not pity *those*
It's the poor old G P s
Who get the hard cheese,
And the hardworking Shmos and J'hos

Those emergency jobs
Aren t all done by the nobs
Where are they at weekends? God knows
And who fills the gaps?
Why, the G P s, poor saps,
And the downtrodden Shmos and J'hos

Some think Mr Newell
A regular jewel
I can't say that I'm one of those
It's the lonely G P
Who is my cup of tea,
And the put-upon Shmos and J hos

[1] *Texas Rep Biol Med* 149 7 363

Letters to the Editor

SIGNIFICANCE OF THE DISCOVERY OF THE EFFECTS OF CORTISONE

SIR,—Professor Pickering's analysis fails to do justice to psychosomatic medicine, because he separates genetic and environmental influences as if they had no bearing on each other An environmental stress can easily be shown to produce different effects on individuals of different physique and as easily be shown to produce different emotional response in people of different character and temperament Over simplification of causation has been one of the great temptations and curses of medicine Selye's thesis has been briefly and rather refreshingly criticised by Meiklejohn [1], but there is, of course, no reason why an adrenal adaptation mechanism should not play a major part in psychosomatic disease, and many reasons to make this a good working hypothesis

Nobody could deny that "alarm," however induced, has an emotional effect The question raised is whether the emotion experienced is the result of physiological disturbance caused by the injury or alarm stimulus, or whether the emotion itself provokes disturbance This is the old and insoluble problem of the hen and the egg, but it is certain that the capacity to experience emotion must exist for certain stimuli to be appreciated at all

We can accept "character formation" by external influences as an explanation of personality, but not as the whole explanation Inherited constitution is the matrix on which education operates, and we cannot simply shut our eyes to the evidence for inherited features in character because we cannot influence them but can influence the environment Professor Pickering says that because "a single mental state" (e g, anxiety) is associated with a variety of disease entities, the psychosomatic conception is invalidated I suggest that this completely ignores everyday experience Of a party of children submitted to an exciting experience, the majority are perhaps pleasurably elated, but one vomits, another has diarrhœa, another asthma, another perhaps migraine, and another wets the bed another may even have an epileptic fit I suppose these symptoms to be often, or even usually, constitutional body-patterns of response to emotional experience, the psychosomatic conception involves a deduction, as a working hypothesis, that such responses may produce structural changes and that these are not always reversible The mechanism of bodily response in particular syndromes has been little studied and presents numerous lines of research

Professor Pickering gives as a second reason for rejecting the psychosomatic conception that "psychotherapy seldom produces dramatic or repeatable effects in these diseases" (This is rather odd phraseology, a disease is either cured or it is not, and if you need to repeat the treatment it is not cured) But there was no need to doubt the association of tubercle bacilli and phthisis before we had streptomycin, nor is streptomycin the cure we hope for Psychopathology is a young science compared to morbid anatomy, and the two terms are comparable Psychotherapy, like other therapies has been the economic basis for research in psychopathology, it has had its occasional cures down the centuries, and with better understanding and technique, its useful range has increased, like that of surgery It has its quacks and its orthodox blunderers like any other branch of medicine Freud, least of all, expected it to become a panacea The effect of his work on medicine can be compared to Harvey's or Pasteur's—work which led us to understand some part of the mechanism of vascular disorders and infections We do [illegible] their work because we have waited a long time [illegible] penicillin and the anticoagulants as partial a[illegible] medical problems We look, in fact, for slow [illegible] in the understanding of psychosomatic disease [illegible] "dramatic effects" from psychotherapy, and [illegible] spicuous and slowly accumulated understan[illegible] prevention

In medical practice we must, perforce, make [illegible] limited conceptions, as of organ disease and causes, but I find it depressing that profe[illegible] medicine should become, in the justifiable p[illegible] technical understanding and equipment, divorced [illegible] a philosophy of medicine I rejoice with Pr[illegible] Pickering that the fashion of "explaining" all [illegible] of diseases as due to focal sepsis has waned, b[illegible] is not to deny that local suppuration can cause widespread bodily disturbance We might well say of causation in medicine what Croce has said of philosophy—the[illegible] are mostly right when we affirm, mostly wrong when we deny But perhaps we do best merely to keep [illegible] open mind

Bickley, Kent DUNCAN LEY[illegible]

SIR,—In his interesting lecture published in your issue of July 15, Professor Pickering refers to several causes of disease and mentions three etiological influences which have been claimed as responsible, not only for the rheumatic diseases, but for a much wider field of physical disorder He might also have mentioned the attempt to incriminate "malnutrition," vitamin and mineral deficiencies, and other defects of feeding as causes of so large an area of disease as to include, for example, dental caries and delay in labour

It is inevitable that these attempts to unify the apparently various factors of etiology should occupy the thought of workers in medical research and practice because they are expressions of a deep desire of man to resolve chaos and disarray into organic order The tendency to such unity or unification can be traced through all the works of the artists, indeed without unity there is little art, whether the medium be music, painting, or the written word Whereas it is of absorbing interest to ponder upon the function of the idea of reality of unity in human satisfaction, this is not the purpose of my letter

It is true that "focal sepsis" is quite discredited as a cause of any group of diseases, or even of any definite disorder such as arthritis As time passed during the early phases of enthusiasm for dental extraction and other efforts to remove centres of infection, accumulating experience, often unwillingly accepted, showed that there was no causal association between the septic tooth and the painful creaking knees In short, the greater the experience of the practice of the theory of focal sepsis, the less was the evidence of its truth It is, however, that what is called "psychosomatic etiology" is totally different from focal sepsis in its relation to disease, because, if for no other reason, clinical [illegible] gives increasing confirmation of its truth Prof[illegible] Pickering dismisses the psychosomatic hypothesis as [illegible] the same value as that of focal sepsis and lists [illegible] objections which would appeal to the "simple minded" student as valid for rejection of the theory He would indeed be simple minded if he found in these objections any cogent argument against a very close association of physical disorder and states of mind and feeling!

Now, most modern specialist physicians are biochemists and manipulators of various engines of diagnosis, and it is not easy for them to realise, until the evidence arises from their own personal selves, that the [illegible] personality is one indivisible unity of mind with emotions and the physical body The two are inseparably married, they are one This apparently dogm[illegible]

1 Meiklejohn A. P Brit med J July 15 1950 p 164

nt will be questioned by many, but I believe
v own and other clinical experience of the whole
—not just the level of his blood chemical sub
—that there are two entities combined in our
ersonality, and that therefore a stress affecting
l provoke an adaptation reaction in both moieties
nly is the development of firstly 'functional
ance" and later the secondary organic lesion
h very many cases of peptic ulcer and of pelvic
ions in women) associated with mental and
mal states beyond the grasp of chance, but also,
ommonly observed, certain visceral reactions, such
rt beat (and even contractions of the non pregnant
) are an immediate result of sudden strong
onal stimuli The mind can scarcely think or the
t" feel but there is some answering physical
ise It is already recognised by almost all, if not
micians that some diseases are so closely related
ntal states that the "psychic" ætiology is not
oned Thyrotoxicosis gastric spasm of peptic
a very large amount of all varieties of menstrual
bance in the young, and inertia of the uterus in
r are all examples of conditions which would
pear from civilisation could it be relieved of ever
asing tension, anxiety, and fear
present we are studying the results of the established
ise, mostly without a thought for the whole per
lity, 'temperament," and domestic and social
-ground But when the physiologists begin to teach
relation of emotional states to physical reaction, and
far this will lead to disturbance of function and
mic changes, we shall have a more solid foundation
the study of the ætiology and treatment of an
widening range of disease
icreasing experience of the theories of focal sepsis
certain nutritional defects as causes of disease found
n wanting, but most of us who see sick people,
n to them talk, and examine and treat them, are
vinced that "psychosomatic" ætiology is indeed a
ent factor If fear could be weighed and measured,
re would be little reluctance to place it and other
otions in their proper place in ætiology, but, as
tony said, "There's beggary in love that can be
koned" I ask myself 'can the completely happy
r be ill?" or "can the permanently miserable ever
well?" These are theoretical questions which might
answered in heaven and hell, but not here Never-
less we have come to associate the buoyant, exalted
id with exuberant health, and the anxious, tensive,
ring temperament with constant ailing complaint

ondon W 1 ALECK BOURNE

ACCURACY IN RED-CELL COUNTS

IR,—Your leading article of July 15, may, I fear,
lead the clinician of small experience into regarding
red cell count as virtually valueless But as he
ws in experience he will realise that one function of
clinician is to *select* those data that are useful for
purpose of diagnosis and treatment When he has
nt to do this he will, I think, find the red cell count
ntains the value that the experienced clinician persists
ttaching to it
he statisticians have done a service to medicine
ut their choice of terms is sometimes unfortunate
instance they refer to 'minimum" error and
robable limit of error" In a red cell count of 5,000,000
minimum error may be nearly half a million, and the
bable limit of error nearly a million The clinician
small experience may infer that the red cell count
has recently received from the laboratory *must* be
east half a million out, and *probably* a million
o confound him I append the blood counts of a
ent with pernicious anæmia taken over a year
During that period her clinical condition showed a slow but steady improvement, which is reflected in the blood counts

Date	*Red cells (thousands per c mm)*	*Hb %*	*C I*
April 14 1949	4000	85	1 06
Oct 5 1949	4300	96	1 12
Oct 31 1949	4600	100	1 08
Jan 16 1950	4650	102	1 1
Feb 18, 1950	4400	98	1 11
May 27 1950	5200	100	0 95

If during this period 20 counts, instead of only 6, had been made, then it is likely that a count with an error of ± 16% might have appeared—e g, a count on Oct 30, 1949, might have given 5,360,000 (or 3,840,000) red cells—assuming Berkson's probable limit of error of ± 16% If such a count had appeared the physician's clinical sense would have questioned its validity

I seem to recall a radio story by A J Alan, in which he accompanies a mathematical friend on a safe breaking expedition The safe had a combination lock, and the mathematical (and somewhat criminal) friend knew that the *possible* combinations were extremely numerous, but, by saying every few minutes "I propose to ignore those results," he quickly found the right answer, and the safe was opened That in effect is what the clinician does—he ignores certain results The method, of course, demands care in its application It can usually be applied safely to a series of counts But if in doubt the clinician can usually repeat a questionable count —e g, a count of 5,360,000 on Oct 30, 1949, would be followed on Oct 31 by one of 4,600,000

The single isolated count is more likely to mislead —the count that appears in response to the request for "a complete blood count please" from a clinician who has not the haziest idea what his patient is suffering from, but hopes that the pathologist (or the radiologist) will make the diagnosis for him If your article does anything to restrict that type of demand I am sure all clinical pathologists will be grateful

Wolston near Coventry G CAMPBELL

ACTION ON TUBERCULOSIS

SIR,—Dr Ball and his colleagues, in their article of July 22, urging that cases of open tuberculosis should be admitted into the wards of general hospitals state "Tuberculous wards in general hospitals can but lead to a revival of interest in this common disease Tuber culosis must be brought back into the main stream of medicine" I feel sure that this will be the unfortunate result They state "Tuberculosis wards in a general hospital are an essential part of sound tuberculosis administration, and lead to efficiency both in preventive and in curative medicine"

Have we any proof of the latter statement? Some forty years ago I took part in an active anti tuberculosis campaign under the leadership of that pioneer in public health, the late Sir John Robertson We gave the contrary advice, and emphasised the need for improve ment in the standard of living, better housing, and provision of sanatoria for segregation associated with complete physical rest and mental tranquillity It would appear from the steady and progressive decline in the number of deaths in England and Wales from pulmonary tuberculosis (40,766 in 1916, 30,108 in 1926, and 18,798 in 1948) that these measures have been rewarded with very considerable success The fact that the graph shows that this encouraging decrease throughout the 20th century was only checked during the two great war periods of 1914–19 and 1939–42 lends support to this In these periods the standard of living and housing degenerated and people were forced to live and work under conditions which we know favour the develop

ment and spread of tuberculosis—i e, in dark, damp, ill ventilated, and overcrowded rooms, subjected to protracted fatigue with insufficient nutritious food, warm clothing, and medical care of the chills and colds which these conditions created

The number of deaths from pulmonary tuberculosis in the slums of Birmingham and other large centres at the time of our campaign was three or four times the number in the better housing areas Dr Ball and others state that "it is a grave reflection on national administration that, throughout Britain, thousands of phthisical patients are left for months in unsuitable homes" yet later in the same column they state "The empty beds are maintained by the discharge of patients as soon as they have reached a stage when adequate care and attention can be given in their own home" We have not the beds or nurses or other staff to treat all the cases of tuberculosis, we have 6000 empty beds in sanatoria because we have not the nurses

It is proved that the girls who nurse tuberculosis are subjected to considerable infection, even in sanatoria designed for the treatment and cure of pulmonary tuberculosis, and while we admire the training which permits Dr Ball and others to give an indication of reduced infections, we must think of the possibility of infection which may cause a reduction in the nurses in general hospitals We know that living in hospitals does appear to increase susceptibility to respiratory infections, including tubercle

The amount of infection from known and unknown tubercle is great In animals, though it has been possible for many years to apply detection and eradication more completely than we can in man, we have not stamped out tubercle We have not the means to provide more and more radiography, more and more sanatoria, more and more beds in general hospitals (the Scottish report[1] states that the larger teaching hospitals should be excluded), more and more chest surgeons which our enthusiasts tell us are desperately needed The excuse for more radiography is that the undiagnosed case of tuberculosis in the general ward is one of the chief sources of infection, yet Dr Ball and his colleagues state "With all patients, particular stress is laid on the need to stop coughing," and "delay in diagnosis is still a major problem and one that mass radiography cannot solve"

The propaganda of fear which speaks of the need for desperate measures fails to convince us of success when these demands are met, for those who have been lucky, or unlucky, enough to be considered sufficiently interesting to be successfully, or unsuccessfully, treated must return to the conditions which rendered them susceptible, probably now worsened by the long absence and the confirmed stigma As the Brookins Research Institute report stated "Standard of living has a greater effect on health than quantity of medical care" While success with the measures so desperately advocated is unlikely, we know it would follow progressive improvement in the standard of living and housing, the teaching of simple hygiene in schools, and better facilities for the family doctor to treat his patients at home

Birmingham JAMES F BRAILSFORD

SIR,—Much is being said at the moment about tuberculous patients who cannot get into a sanatorium, and the shortage of nurses is always mentioned as a major cause of their plight At the two sanatoria at which I have been matron since 1939, it has been possible to staff all beds, and I know of other sanatoria where beds have not been closed for lack of nurses I think too much is being made of the nurse shortage problem, especially in places where it does not actually and so attention is being diverted from the additional wards Many plans for new wards been drawn on paper, but so often building and financial considerations have prevented them being put into effect

With 400 people dying every week from tu and hundreds more becoming infected, it seems that the position should be treated as an If it were treated with the same energy and was the need for providing beds for expected casualties at the start of war, even the crudest for shortening waiting lists would be given consi

If a "tuberculosis emergency state" could be I would like to put forward these two schemes

1 The erection of summer wards Since we lack money and the time needed for the construction of buildings, let us have quickly-erected prefabricated with fronts wide open to the weather, for use from October It would be cruel to put patients into such quarters in the winter, but they would help to shorten of the waiting lists during summer

2 In the sanatoria where beds *have* been closed for of nurses, some of the women's wards might be opened selected early cases which, apart from supervision Sister, would receive no nursing attention

The physician in charge would need to select pat who could go to the toilet and bathroom and make their own beds (beds provided with spring mattresses do not have to be turned) Despite having to do all to help themselves these patients would get 22 or 23 hr bed rest out of the 24 At present many a homes waiting for a bed in a sanatorium, simply cannot (lack of full time help in the home) take the rest might save her life—especially if she has children

MARIE A SIMPSON
Sanatorium Matron.

1 Tuberculosis Service in Scotland *Brit med J* July 8 1950 p 61

LARYNGEAL VERTIGO

SIR,—In your interesting leading article of July you do not mention the prolonged expiratory of crying which in some children may end in la spasm, and is then called a "*breath holding* attack"

This designation is unfortunate because it wrongly that the attack is purposely induced by child, who is accordingly rewarded with harsh ment It is true that the sharp stimulus of a or a douche of cold water will end the spasm, but reason for giving it must be clearly explained to parents so that psychological difficulties may be avo

London S E 26 JOHN BURKINSH

TORSION OF THE GREAT OMENTUM

SIR,—May I reply to Mr Michael Smyth's lett July 15, and his remarks regarding my article of Ma In the first place, I did not neglect the British litera I only included in my bibliography those authors evidence supporting my conclusion that my case be regarded as one of primary torsion of the omentum Originally, I had concluded my bibliogr by saying "I am also indebted to many other aut too numerous to be cited," but this remark was out of order by the Editor In his letter, Mr Sm seems to deny that torsion of the whole omentum entity yet in his article, to which he refers, he that "the whole omentum may undergo tors I consider that when the torsion extends to the inf border of the transverse colon, or the greater curva of the stomach, it is justifiable to consider it a of the whole omentum Primary torsion of the omentum is so rare as to warrant publication presenting symptoms and signs are neither constant well known These cases are almost invariably diagn as an acute abdomen, and, first things being first

y acute appendicitis However, so long as the n is recognised at operation and properly treated ion of the mass, a surgical cure will be achieved

ton General Hospital R REJTHAR
orthumberland

STIMATION OF PROTHROMBIN-TIME

—I was most interested in Dr Lehmann's letter 17 (p 1133), in which he ascribed the irregular obtained in the estimation of prothrombin times use of soapless detergents for cleaning the glass This has also been noted by several investigators ng myself, working in different laboratories in ited States and employing a variety of thrombo preparations—e g, 'Maltine Chilcott,' 'Difco', pley's placental thromboplastin [1] In our labora ve have excluded soapless detergents for cleaning assware which is to be used in coagulation studies ierefore welcome the attention which Lehmann awn to this important source of error His findings e further study in regard to their theoretical ations

Tork Medical College A L COPLEY

THE ALEXANDER LIBEL ACTION

—I read Dr Barlow's article, in your issue of with the greatest interest I should like to draw eaders' attention to two passages in his account of ion

'rof Samson Wright dealt carefully with this point established that what Alexander was referring to as primary control' has nothing whatever to do with ms s concept of the *Zentralapparat* which refers to es in the brain stem "

Summing up on this point, the Appeal Judges said The expert witnesses called for the defence say that nder s knowledge of these subjects is very limited and of them suggest that he never read any description of ms s experiments but was given a second hand account em which he did not understand ' "

ve had an intimate association with Mr Alexander se on twenty two years and have been with him he was reading the account of Magnus's experi as described in THE LANCET over twenty years nd when he was reading the account given in the lectures Further, I was at least one person who um " a second hand account of them " inasmuch rovided him with a translation from the original an in which Magnus wrote his book *Körperstellung*, ive him what I considered to be the meaning of the ges on p 619 I understood these passages as bing the anatomical foundations of a central ating apparatus, its manner of operation, and ice of operation in the operation of the cerebro sensory motor, and muscular mechanisms of the l as a whole within the range of animals on which is had experimented.

m claim no expert standing as a German scholar ay have been responsible for laying Mr Alexander o a charge that he relied upon a person who was not tent to guide him May I suggest that a reliable ation of these passages should now be made in that their meaning in English may cease to be a r of dispute ?

reasons for this suggestion are that F Matthias nder, the late Rudolph Magnus, and the late Coghill, all working quite independently, all ng experimentally, and, by the nature of their s and education, working largely without pre ptions about the subject with which they worked to the conclusion that they could demonstrate they variously called a ' primary," " central," or iordial and indigenous " integrating guidance and direction of the living " psycho physical " or " psycho organismal " whole In his work with living persons, Alexander has transcended the work of Magnus and Coghill by providing a technique whereby a person may make use of primary control and may thus guide and control the manner of the performance of his reactions in the best possible way

Alexander may appear to stand quite alone in making his experiments and in drawing his conclusions from these experiments, but it is possible, as I contend, that he would not be quite alone were the words written by Magnus about *Zentralapparat* translated without prejudice

Bolton MUNGO DOUGLAS

1 Copley A L *Science* 1945 101 436

SUPPLY OF HEARING-AIDS

SIR,—The recent statement in the House of Commons [1] that the delay in issuing of the 'Medresco' aids is largely due to inability of technicians to fit them fast enough certainly gives a very erroneous impression of what is the actual fact in certain hearing aid distribution centres One to which I am attached had the supply of aids suddenly reduced, a month ago, to almost exactly half the number per month, which meant a heartbreaking rearrangement of appointments for issue The only benefit noticed has been the increase in time available to the technicians to attend to the enormous number of minor repairs necessary for the mass produced instruments

One accessory for which there is a great delay was not mentioned the individual plastic moulds for the inserted earpieces are not being produced nearly as quickly as the demand requires

London W 1 IAN G ROBIN

INTRAVENOUS PROCAINE AND ANTI-HISTAMINE DRUGS IN BRONCHIAL ASTHMA

SIR,—In 1941 Dos Ghali, Bourdin, and Guiot [2] reported that procaine administered intravenously had proved effective and safe in the treatment of bronchial asthma I report here on the treatment of 12 cases of severe asthma and 21 of severe asthmatic bronchitis with intravenous procaine and an anti histamine drug

Of the 12 cases of asthma, 7 had status asthmaticus, 2 having been in bed for over a month The 12 patients included a child aged 7 years, and 4 aged about 15 years The remainder comprised 4 women and 3 men in their twenties, each with a history of recurrent attacks of asthma since childhood Most of these patients were confined to bed when first seen, owing to the severity of the attacks ephedrine, adrenaline and theophylline with ethylenediamine had been tried either by other doctors or by myself before starting the new treatment which was applied only where these had proved unsatisfactory Each patient was thoroughly examined and his chest was radiographed, and in each case stools were examined for parasites In 7 of the 12 cases of asthma no underlying organic case was found

The patients were submitted to a skin test for sensitivity to procaine, and thereafter were given up to 10 ml. of 1% procaine hydrochloride (without adrenaline) intravenously Immediately after the injection the patient feels light headed—a sensation which lasts for a few minutes and is followed by a sense of relief and well being The spasm is much decreased but not totally abolished He is then given 0 2 g of 'Neoantergan' by mouth, and the drug is continued in a daily dosage of 1 g, in four divided doses, for a week, after which the dose is gradually reduced to a maintenance level In only 2 cases was it necessary to give a second injection of procaine, on the day after the first

In the 7 cases of asthma where no cause was apparent the attacks became mild and infrequent, the remain

1 See *Lancet* July 15 1950 p 113
2 *Bull Soc méd Hôp Paris* 1941 *Pr méd* 1943

ing cases benefit, though slighter, was still evident In the 21 cases where the asthma was secondary to bronchitis, this combined treatment gave equally satisfactory results No ill effects from the procaine injections were noted Neoantergan in initial doses of 1 g daily was much less satisfactory when given during the attacks, unless these were first arrested with procaine, and with this heavier dosage there were no ill effects apart from slight nausea and "drunkenness"

Kasr-el-Ainy Hospital Cairo S M TALAAT

CLINICAL PATHOLOGY IN THE N H S

SIR,—No doubt many clinical pathologists will have read Dr Dyke's article of July 15 with satisfaction at seeing their own view expressed so clearly

Some of his points deserve underlining His plea, not for extreme centralisation, but for centralisation within the group, or even within a super group made up to two or three groups, is important A scheme whereby technical personnel may, without difficulty or formality, be transferred for periods from one laboratory to another, so that every technician spends some time at the group or central laboratory, should ensure that techniques are progressive and moderately standardised

Of even greater moment is the light which Dr Dyke throws upon what is in effect a quiet revolution—namely, the development of a National Service in Clinical Pathology The value of the service as now conceived is threefold By enabling general practitioners directly and quickly to obtain simple but important laboratory investigations, and thus establish diagnosis, and, in certain cases, institute and control treatment, it

1 Saves working people's time and health

2 *Maintains the practitioner's interest in both his patient* and his art (The tendency was for the former to disappear in hospital, and the latter consequently to languish)

3 Saves beds

The clinical pathologist should regard it as an important part of his function to collaborate, genuinely and effectively, with the general practitioner Though domiciliary visit fees are no longer paid, few whole time pathologists will on that account deny their consultative services, which may be helpful to the practitioner and which certainly enliven their own routine bench work

Dr Dyke's article gives the sort of guidance required for this experiment in a National Clinical Pathology Service

Blackburn Lancs M. S SPINK

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis in the week ended July 15 numbered paralytic cases 152 (139), non paralytic cases 60 (73), total 212 (212)

The figures for the previous week are shown in parentheses With identical total figures for the two weeks, there was an increase of 13 in the paralytic cases offset by a reduction of the same size in the non-paralytic cases

The disease is still most prevalent in Warwickshire, but notifications there are on the decline as the following figures show

Week ended	Cases Paralytic	Non paralytic	Total
June 24	43	2	45
July 1	39	8	47
July 8	37	4	41
July 15	32	6	38

In Lancashire, where there has been some prevalence of the disease, there was a small increase of 6 paralytic cases to a total of 18 and a decrease of 1 in the non-paralytic type to a total of 4 In Worcester there was a material fall from 16 paralytic and 6 non-paralytic to 10 paralytic and 1 non-paralytic In Lo[illegible] there was a decided fall from 15 to 4 paralytic to 4 non-paralytic cases

Food-poisoning in co Durham

The outbreak of salmonella infection at [illegible] which we described last week (p 147) is now over There has been one death, in a woman who had eaten the pork sandwiches A post-mortem examination has been done, on the coroner's instr[illegible] but the bacteriological findings have not yet been received The organism has been isolated from the interior of a portion of the infected pig's carcass from its intestinal wall

The June Quarter

In England and Wales the numbers of both still-births and deaths of children under 1 year of age [illegible] in the second quarter of this year were the lowest record for any June quarter[1] There were 4175 still-births giving a rate of 22 5 per 1000 total live and still-births These figures compare with 4470 and 22 7 in the period a year ago, and 6639 and 38 9 in the June quarter of 1938 Deaths of children under 1 year of age numbered 5026, representing a rate of 28 per 1000 related births In the second quarter of 1949 there were [illegible] giving a rate of 30, while in the same quarter of [illegible] there were 8006 with a rate of 50 The number of live births registered was 181,784, giving a rate of [illegible] per 1000 total population, compared with 17 6 in [illegible] 18 6 in 1948, and 21 9 in 1947

There were 120,746 deaths registered, giving a rate of 11 1 per 1000 total population, compared with 11 0 [illegible] 10 2 in the second quarter of the two preceding years

1 Registrar General's Return for the week ended July 15. [illegible] Stationery Office Pp 20 6d

Births, Marriages, and Deaths

BIRTHS

BLOOM —On July 16 the wife of Dr Harold Bloom—a son.
BURY —On July 13 in London the wife of Dr J D Bury—[illegible]
CASPERS —On July 12 at Cirencester Glos the wife of Dr Ant[illegible] Caspers—a daughter
HOLLINGS —On July 18 at Warrington Lancs the wife of A H Hollings—a son
ISSERLIS —On July 13 the wife of Dr K P Isserlis—a son
KASSMAN —On July 17 in London to Dr Sheila D Mos[illegible] wife of Mr Alec Kassman—a daughter
KLEFT —On July 13 at Worplesdon Surrey the wife of Dr Kleft—a son
MACCARTHY —On July 13 the wife of Dr Dermod Mac[illegible] —a son
NELIGAN —On July 11 at Newcastle upon Tyne the wife [illegible] Gerald Neligan—a daughter
STRUTHERS —On July 15 at Bristol the wife of Dr G Str[illegible] —a son
SWEET —On July 19 at Oxford the wife of Dr A M [illegible] —a son
THOMAS —On July 6 at Taplow Bucks the wife of Dr [illegible] Thomas—a daughter
WENGER —On July 16 at Burslem Staffs the wife of Mr [illegible] Wenger F R C.S —a daughter

MARRIAGES

ARTHURTON—EDMONDS —On July 15, at Banstead Surrey [illegible] William Arthurton M R C P to Evelyn Florence Edmo[illegible]
FREELAND—EVANS —On July 16 at Ilford Essex, [illegible] Freeland B M to Patricia Evans
JOHNSON—OLIVER —On July 15 in London Francis Johnson M B to Patricia Eva Oliver
MAYCOCK—DESCH —On July 22 in London James [illegible] Maycock M B to Marie Louise Desch
WATKINSON—VELDHUYZEN —On July 15 in London [illegible] Watkinson M B to Ellen Veldhuyzen M B
WHITE—LOSEBY —On July 8 in Hong Kong Charles [illegible] White B.M to Diane Jeannette Loseby
WILSHERE—WELLS —On July 15, in London Basil [illegible] Wilshere M R C S to Anne Wells

DEATHS

GOLDIE —On July 17 Edward Alexander Marie Joachim M C M B Lond
MALAHER —On July 18 at Reading Bruce Malaher [illegible] major R.A M C. retd aged 62
PRICE —On July 24 in London Ivor Isaac Price M.B Lond.
STEVENSON —On July 14 at Cambridge Claude Maberly St[illegible] M D Camb
WILLIAMS —On July 17 John Cadwaladr Williams M[illegible] aged 90

Notes and News

ROYAL MEDICAL BENEVOLENT FUND

e annual general meeting, held on July 11, Lord hnson was re-elected president, Dr C Luther hon treasurer, and Mr Victor Riddell hon secretary atteson, in producing his report for 1949, said that d had been able to distribute £37,202, which was ore than in any previous year and left a deficit of Despite State action, many people still depended on le societies for the necessities of life, and to supply cessities some of the Fund's grants were now at the £3, £4, or even £5 a week Some of those thus were members of the medical profession, old and with none to care for them, who needed large grants estic or nursing care, others were elderly widows hters who were in great distress, and young widows ildren to educate and maintain

anked especially those subscribers who had responded ppeals to sign a seven year deed of covenant for the s showed £5333 income tax recovered under deeds gure includes one year s claim and also part of another "Once more,' he said, "I ask all those who have set their signature to a deed to communicate at once he office (1, Balliol House, Manor Fields, London,) who will send the necessary paper for signature ct that the deed is signed does not mean that it costs bscriber more, but it does mean that it benefits the m being able to reclaim income tax" Various ways ich the Fund could be helped and the office work d were (a) by using a banker's order (the Fund's rs are Westminster Bank, Hanover Square, W 1), sending cheques early in the year, (c) by signing a year covenant, and (d) by remembering the Fund in —taking care to give its correct title and address

THE VIM SYRINGE

-srs Henry Milward & Sons have lately sent us one of latest 20 ml 'Vim' syringes, through their agents s Chas F Thackray Ltd This is of the glass and metal having a ground glass plunger but a metal nozzle ed to the glass barrel with a high melting point cement eatures of this syringe are sturdy construction, excellent plunger to barrel, clear graduations (in ml) which are into the glass and are therefore presumably permanent e provision of a "luer" mount—in this instance fitted lly It would be a great advantage if the luer t were used for all syringes, since it is robust and its bore is suited for the transmission of viscous fluids nanufacturers have incorporated a flat surface on the at the end of the syringe barrel, to prevent it from g on an inclined surface The only point to criticise flimsy wire attachment which is supposed to prevent plunger from falling out of the barrel if it should be ted The syringe can be sterilised by boiling if the er is oiled before assembly and the syringe placed in soft water which is then brought to the boil Alterna , dry sterilisation can be used, provided that a tempera of 160°C is not exceeded, beyond this temperature the nt attaching nozzle to barrel might melt It is pleasing d a British made syringe whose workmanship will stand arison with that of any similar foreign product

COUNTRY DOCTOR

ntry Doctor a film strip devised by Dr Stephen Hadfield, ut pictorially a typical day in a country doctor s life strip together with the script that accompanies it d be especially useful for showing to older school children s been produced as one of the "Men at Work" series, mmon Ground Ltd Sydney Place, London, S W 7

ersity of Manchester

part 2 of the examination for the D.P.M., J T Leyberg lfred Model have been successful

of F C Wilkinson is retiring from the chair of dental ry, and the deanship of the dental school on Nov 1

ersity of Leeds

A F Maloney has been appointed to the new post of er in neuropathology Dr B W Wyke has been nted lecturer in physiology, and Dr R N Tattersall al lecturer in medicine

University of Oxford

In a congregation on July 15, the following degrees were conferred

D M—*W D Brinton

B M—D J Goldsmid C N Watson J D Cairns G C R Morris John Taylor J G Armstrong J M L Gilks G E D Morrhall W W Slack W A Openshaw J R W Gleave, R F Brown M J Evans J L Galbraith Margaret E H Warwick Margery P S Woolf *M J Rosenthall *Jean M Shanks, *Anne S Fowkes

* In absentia

On July 25, the honorary degree of D C L was conferred on Viscount Addison, M D, and the honorary degree of D SC on Prof G W Corner, M D

University of London

The following have been successful in recent examinations

D M R D—W E Craddock Joan M T MacCarthy William Smith W R R Thursfield C D Wilson Sharp

D M R T—E W Emery Frances A Fouracres Basil Strickland

Dr E R Boland has been elected dean of the faculty of medicine for 1950–52

The title of professor emeritus of surgery has been conferred on Prof C A Pannett, on his retirement from the chair of surgery at St Mary's Hospital Medical School, which he has held since 1922

The title of professor emeritus of obstetrics and gynæcology has been conferred on Prof James Young, on his retirement from the chair of obstetrics and gynæcology at the Post-graduate Medical School of London, which he has held since 1934

University of Birmingham

On July 1 the honorary degree of doctor of science was conferred on Dr Leonard Colebrook, F.R S, and on Prof H M Evans (University of California) The following degrees were also conferred

M.D—R G Record (with honours) C R Lowe A G W Whitfield

M Ch—C P Nicholas

Ph D—C N Hand

M B Ch.B—Pamela M Moody G W Thorpe J A Williams (with second-class honours) Dorothy S Alabaster Patricia J Barnes J D Baston Pamela Beal Betty N Brain Mary Cooksey H G Cooper Cyril Dexter A F Dukes Cathleen M Elliott, N W J England M J Everton Amy M Fawcett D F Ferrington John Fredoun Daphne M Hampton, P F Harris R S Harris A R Harrison R J Hetherington J S Howell J P Lavender Gwladys N McCoach J M Park J W Parkin J R Pearson B W Petty F L Richardson Nancy G S Roberts W R Roberts G J R Soutter J M A C Stewart H J S Waldeck J M Walker W L Whitehouse W E S Whittingham Rosalinde J Hampton (in absentia)

Dr R Schneider has been appointed lecturer in experimental therapeutics in the department of pharmacology The following have been appointed university clinical lecturers

Dr A L Deacon (obstetrics and gynæcology) Dr G M Holme (radiology) Dr C W Taylor (clinical pathology), Dr A C Crook (endocrinology) Dr M Sim (psychiatry) Dr R W Tibbetts (psychiatry) Dr Margaret L A Galbraith Dr Helen Scott Mason Dr Margaret J Mills Dr Doris J Wall Dr Janet R Welsh Dr Helen M Wood (anæsthetics)

University of Edinburgh

On July 19, the following degrees and diplomas were conferred

M D—‡‖D M Blair, ‡H M Brown ‖J H F Brotherston ‖Joseph Collins Mary A J T Douglas, Frances M Earle, Audrey L Ferguson †D C Haig S P Hall Smith Morag L Insley (née Henderson) †Mary E Lothian (née McLaren), *I F Sommerville †Thomas Sommerville ‡J A Tulloch †John Wallace *G M Wilson

D.Sc—T F Ogilvie M D

Ph D—F H Sims, M B

M B Ch B—J G Abercrombie W T C Adamson A A Akiwumi D S Alexander, Jean M. Arkieson Natalie H F Armstrong J D Arthur T A Ballingall, Rosemary A Begg (née Kemp) Sheila M. Black Jennifer P Bland Raymond Bliss D W Bookless Elizabeth S Brown (née Bennett), J R Brown L S Brown Janet C Bryce, Patricia M Burke, I D Campbell J C Cape R A Caulfield, John Chalmers I M Clark I L Clark Agnes A Cochrane J F J Collins I A Colville, N M J Cowan F J Darby, A H Darling A S Dawson R M Dean, Inderjit Dial G M Dobbie C G B Downie R W Downie, J J Drever Catherine W Drysdale Robert Edmond A E Elliott D J Erskine G S Fiddler J W Fisk J I M Forsyth G D Forwell Margaret C Galloway W A S George J M C Gibson Deirdre M M. Gillies Elsie M Glennie, T M. Goodall A B Goorney J G Gray G J Green D C Greig S C C Grieve R E Gristwood A A Gunn G K M Hall A M Hall Gardiner W A Hanna John Harkness Joan Harper Ball D M. Hastings, R E Haworth, Daphne E A Healey Ethna E R Henderson Jean M. Higgins, John Hill, G F A Howie Richard Hutchinson Margaret Jackson F D Johnston W T Jones Victoria K. Kelly D S. S Ker C O R King §M R King J R Kirkpatrick A W Laing §Anne T Lambie, I H Lawrence Barbara Leach, F H Lockwood J R A Luckas Ronald McAdam J S M Macaskill R H McClure

P W McCormick F I MacDonald J D McDonald J S Macdonald Jill MacDonald (nee Russell), Annie M McDougall J B Macfarlane P S MacGibbon A D McIntyre, Patricia C Mackay, C L MacLeod D C McNutt, A I MacPhail, Margery A Macpherson Frances E A McVey D H McVie W L Marshall, J A M Martin M C Maw, A W Maxwell Douglas Maxwell Norman Mendick G L Minter Jean S H Mitchell Logan Mitchell Pamela A Moncreiff, B M More Donalda M Morgan, J A J Morrell Hilary L Morss Mary W Moss J R Munro Danuta Oktawiec L L Ostrowski I V E Owen, J C Paterson Joan Pears David Penman W A Penman N B Peterkin A F Phillips, J T Rabie B A Rapier I D Reid L R Roberts J G Robertson, Elizabeth Rose W R Ross §G F M Russell, I A Ruthven Stuart J D St Clair T F Sandeman, P J Scally D G Scott, G A Scott R G Scott Kathleen J C Shaw W C Shepherd F O Simpson W T Simpson §A W M Smith S M Smith Yvonne R Sneddon John Spence, J F Stephen W I Stuart, Pamela M Sutherland Elizabeth M Sweet Margaret F Taylor William Taylor Boodhun Teelock Andrew Thomson W G Thomson Priscilla E Turnbull D H Vaughan Margaret A Walker W C Walker W G Walker J J Wallace, A S Watson, Alison A P Watson A St J Wilding A K Wilson G C Wilson Pauline I M Winn H I Woodliff D G Wray, A C Wright M J Wright Sheena M Yule

B Sc—‖P N Edmunds (first-class honours)

D P H—M D B Ahmad, A M Allan Doris M Beaton Gerald Dison G A F R Gibson Ronald Lwin, Phyllis F Lyne, Joan M McWilliam J M Neilson, C I Phillips I C Wilson

D T M & H—W L Barton A R Duff Agnew Laing G S C Nzegwu W T Thom, A V Wells

D M R D—R J Bruce M A Caldwell Nichols Richard Cuthbert J C Duncan Gerald Goodall Copestake

D M R T—V R Naidu

D Psychiat—Helen C S MacLean

The Cameron prize in practical therapeutics was awarded to Prof R A Peters, F R S, in recognition of his discovery of dimercaprol The Ettles scholarship and Leslie medal for the most distinguished medical graduate of the year were awarded to Anne T Lambie

* Medal for thesis † Highly commended for thesis
‡ Commended for thesis § With honours ‖ In absentia

Royal College of Physicians of Edinburgh

At a meeting of the college held on July 18, with Dr W A Alexander, the vice president, in the chair, the following were elected fellows

Kalla K V Rao R L Langley E L Thomson

The following were elected members

John Gillies J B Caylor G I H Braine Zbigniew Godlowski, R P Leake D R Huggins, Leonard Cromo I S Meredith A T M Myres B F H Koch R W B Scutt Betty E A Magill R J Cuthbert, Nan Wan Low Dina N Banerjee, R L Amolls R A Burston J McC Murdoch E V C Dawson R C W Lowe A D Muir, L S Smith R W Morris Mary Patten Isaac Cohen

Mr Leonard Jolley, librarian of the Selly Oak Colleges, Birmingham, has been appointed librarian of the college in succession to Mr T H Graham, who has retired

Royal College of Surgeons of Edinburgh

At a meeting on July 19, with Mr W Quarry Wood, the president, in the chair, the following were admitted fellows

S O Awolyi A S Badger A N Cameron Lazar Ganz S P Jain F R C Johnstone, N R Mackay K G Malcomson J R Moffat R F Mulligan J G Murray, K K Murthy J A O Carra E H Rees W A T Robb D I Roberts Kenneth Rostron Edward Sarfati J H S Scott Harmel Singh J J W van Zyl S P Wanchoo I B Watson R B C Welsh

Royal Society of Medicine

The council of this society has decided to create a section of general practice, which "will concern itself solely with additions to and applications of medical knowledge under the conditions of general practice," and "will strictly avoid any suspicion that its discussions embrace any matters concerned with the political and ethical as distinct from the technical and scientific aspects of general medical practice" If within three months no objections are received from fellows, the new section will ipso facto be established

Harveian Society of London

The summer meeting of this society was held on July 19, at the Papworth Village Settlement, where Dr R R Trail medical director of the settlement and president of the society, explained the principles on which Papworth worked There were, he said, three main objects—active treatment rehabilitation, and resettlement He pointed out that no child born at Papworth during the 32 years of its existence had developed pulmonary tuberculosis Visits were paid to the X ray department, where demonstrations were given and to the industries where patients were seen at work making leather goods, furniture and motor car bodies and engaged in printing and book binding

Edinburgh Post-Graduate Board for Medicine

On Monday, July 31, at 3 30 P M in the anatomy theatre of Edinburgh University, Dr A J Rhodes on Poliomyelitis and Poliomyelitis like Illnesses.

British Medical Association Prizes

The Sir Charles Hastings clinical prize (50 g. offered by the association for an essay, by a member in general practice, which "must include personal tions and experiences collected by the candidate practice" The Charles Oliver Hawthorne clinical pr be awarded as a second prize Inquiries should be to the secretary of the association, B M A House, Square, London, W C 1

Weekend Course on Rheumatic Diseases

A weekend course on the chronic rheumatic di to be held at the rheumatism unit of St Stephen's London, S W 10, on Saturday and Sunday, Oct The course will be opened by Lord Amulree, who on the social and economic aspects

Institute of Ophthalmology

On Oct 4 Dr Russell Brain, F R C P, will deli inaugural address of the new session at 4 30 P M institute, Judd Street, London, W C 1 The annual of the institute will be held the same evening at at Claridges Hotel To both of these functions past of the institute and of Moorfields Westminster and Eye Hospital are invited Tickets for the dinner be had from the secretary of the institute

Royal Appointment

Surgeon Captain G F Abercrombie has been app an honorary physician to the King in succession to Captain C C Elliott

Appointments

CHIVERS, MABEL M B Cape Town, D A consultant anaes mainly hospitals in No 8 (Pontefract and Castleford) h management committee group

COATES D M., M B Manc D.M.R.D consultant radio Stockport and Buxton group of hospitals

CUBIL G M M B Glasg D P.H & M O H, Wallsend upon Tyn

FRIDLAND, C M M B Cape Town D.A consultant anaest hospitals in No 14 (Halifax) hospital management group

HALL, JEAN, M B Leeds D.A consultant anaesthetist hospitals in No 2 (York A) hospital management com group

HAMILTON A D M M B Belf, D I H tuberculosis M O Liverpool area

LAING STEPHANIE M R C S D C H asst county M O Nort Kent

LEESE, ARTHUR M A M D Camb M R C P consultant in medicine mainly hospitals in No 21 (Leeds A) h management committee group

LYALL, THOMAS M B Aberd asst venereologist venereal clinics in Birkenhead Wallasey and Liverpool

McCANDLESS ANNE M D Lpool M R C P consultant pedi certain hospitals in Liverpool

MORGAN FREDERICK M D Brno asst venereologist v disease clinics in Liverpool

NICHOLSON R S M R C S tuberculosis M O, Ormskirk a

REDDING J H, M B Belf, F R C S E consultant ort surgeon Walton Hospital Liverpool

REES D F M R C S D A consultant anaesthetist ho No 11 (Dewsbury Batley and Mirfield) hospital m committee group

ROTH MARTIN M D Lond M R C P, D P.M director o research Crayfingwell Hospital Chichester

SCARR J B L M S S A D A consultant anaesthetist Bar district group of hospitals

ZACHARIAS F J M D Lpool M R C P consultant p Clatterbridge General Hospital Cheshire

Hospital for Sick Children Great Ormond Street, London

BRIDGES MARGARET M B Lond junior resident a registrar

BRIERLEY LORNA M B Brist D C H registrar depar psychological medicine

BROWNE MARGARET M B Ldin resident anaesthetic r

GREAVES J L M D Lond M R C P resident asst (senior registrar)

HOPEWELL J P M B Lond F R C S house surgeon registrar grade)

JACKSON A D M M D Lond M R C P D C H asst registrar

MILLICHAP J G M B Lond M R C P D C H house (junior registrar grade)

MONTGOMERY J N M B Belf M R C P D C H house (junior registrar grade)

ROUTLEDGE R T M B Lond house surgeon (junior grade)

SWYER I R M A M B Camb M R C P, D C H asst registrar

ONATAL DIARRHŒA AND VOMITING

UTBREAKS IN THE SAME MATERNITY UNIT

ALAN C KIRBY
M B Lpool, M R C P, D C H
MEMBER OF THE SCIENTIFIC STAFF OF THE MEDICAL RESEARCH COUNCIL

EDWARD G HALL
B Sc, M B Manc
BIOLOGIST, ALDER HEY CHILDREN S HOSPITAL, LIVERPOOL

WILLIAM COACKLEY
F I M L T
n the Department of Child Health University of Liverpool, and Alder Hey Children s Hospital

\ 1945 the association of a particular serological e of *Bacterium coli* (var *neapolitanum*) with infantile tro-enteritis was noted (Bray 1945, Bray and Beavan 8) Similar observations have since been made by s and Sangster (1948), Giles et al (1949), Holzel et al 49), and Taylor et al (1949), the last authors calling strain *Bact coli* D 433 Our purpose here is to cribe two outbreaks of neonatal diarrhœa and vomiting different clinical types One was associated with a ain of *Bact coli* serologically identical with that ntioned above, and we shall refer to it as *Bact coli* 433

During a long term investigation of cases of infantile stro enteritis admitted to Alder Hey Children's ospital, in which special attention was being paid to e occurrence of *Bact coli* D 433, it was noted that a vere case, with this organism in the stools, had been mitted within five days of discharge from a Liverpool aternity unit (A) When this unit was visited by one us (A C K) on Feb 24, 1949 2 babies in the premature by unit were found to be ill with diarrhœa and vomiting ich had been attributed to parenteral infection, though local focus could be found Rectal swabs from ese two infants gave profuse growths of *Bact coli* 433, and we therefore decided to make detailed vestigations

Maternity Unit A consists of the main block (approximately 100 beds) and the premature unit (12 cots), parated by approximately 150 yards of open ground In the main block normal newborn infants are kept in its at the foot of the beds of their respective mothers in ree wards of 25 beds each Attached to the wards is large nursery to which these infants are taken for thing and weighing—procedures usually though not ways carried out by the nurses from the babies' own ards Infants who are immature, who are suffering from nor infections, birth injuries and other abnormalities, who require test weighing, and infants whose mothers e ill, are kept in the nursery Babies with minor fections are separated from the rest in one corner The rsery has its own nursing staff, but its nurses not requently assisted in bathing and weighing the normal ants from the wards

Leading from the nursery is a corridor on to which en the feed kitchen and four separate cells each ntaining one cot, where infants suffering from more ious infections are nursed So far as possible the duty nursing these infants was discharged by a nurse who d not come into contact with any other babies, though derstaffing sometimes made this impossible

As soon as the outbreak of infection was recognised was decided that normal babies should be bathed and ughed in their respective wards, and those infants who uld normally have been put in the nursery were left th their mothers thus the number of infants in the rsery was kept at a minimum until there was no dence of new cases occurring For one week only, admission to the maternity unit was limited to abnormal obstetric cases requiring expert care

The premature unit, which has its own nursing staff and feed kitchen, consists of two wards, of 6 and 4 cots, and two rooms containing 1 cot each It was the practice to keep the premature infants in the main nursery for twelve to twenty four hours before transferring them to the premature unit For three weeks after the outbreak of gastro enteritis was recognised this transfer of prematures was suspended

COURSE OF THE INVESTIGATION

The investigation developed along the following lines

1 Infants in whom diarrhœa and vomiting was suspected or had developed were isolated as far as practicable and rectal swabs were taken immediately

2 All infants in the maternity unit had rectal swabs taken As the first 2 suspicious cases had been found in the premature unit, all in that unit were swabbed immediately, and thereafter every seven days During the first week, in addition to any showing suspicious features, all who were for discharge from the main block were swabbed on the day of leaving From the eighth to the eleventh days, inclusive, of the epidemic, specimens were taken from every infant in the main block Swabbing of infants on discharge, and of suspicious cases, continued daily for a further fourteen days after this

3 All hospitals in the city to which cases of infantile diarrhœa and vomiting are admitted were asked to inform us of the admission of any infants who had recently been discharged from Maternity Unit A This arrangement was continued for several weeks after the outbreak had apparently ceased

4 Further observations were made on the following groups of infants who were apparently well on discharge from the maternity unit

(*a*) The 12 who had rectal swabs positive for *Bact coli* D 433 on discharge

(*b*) A group of 43 selected at random from those discharged with rectal swabs negative for *Bact coli* D 433 Of these, 25 had a further bacteriological and clinical examination Of the remainder 13 who did not attend were contacted by letter or through the maternity and child welfare service The remaining 5 could not be traced.

(*c*) A second group of 28 also selected at random from those bacteriologically negative on discharge, was followed up by letter Of these we failed to trace 4 only

(*d*) The 2 infants at risk in the premature unit who were discharged well and bacteriologically negative

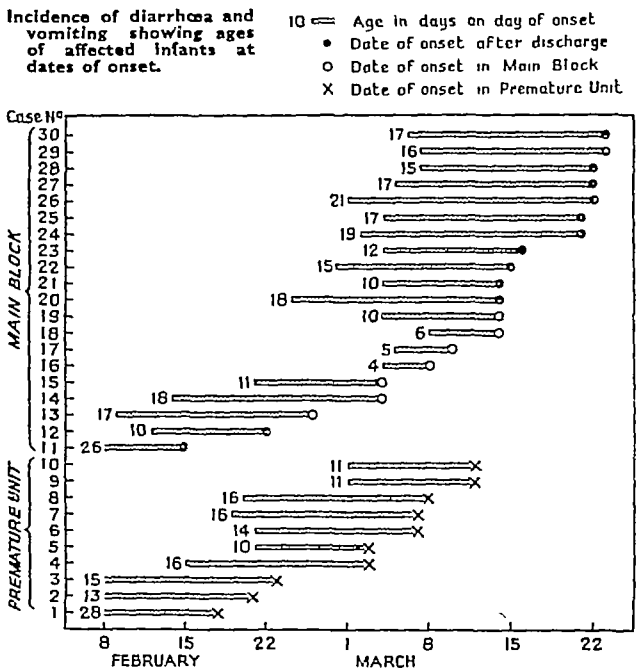
A decision that the infants in (*b*) (*c*), and (*d*) were unlikely to develop diarrhœa and vomiting was not made until they had been discharged from the unit at least fourteen days This period of fourteen days was taken since it was thought probable that it was the maximum incubation period of the disease, and that diarrhœa and vomiting later than this was therefore unlikely to be due to infection acquired in the maternity unit In actual fact all the infants in these groups remained well for at least a month

5 All infants in the maternity unit nine weeks after the beginning of the outbreak had rectal swabs taken No further cases had occurred in the unit during the previous five and a half weeks

6 Another Liverpool maternity unit (B) of about 100 beds, in which no cases of diarrhœa and vomiting had been noted over a long period was investigated bacteriologically during the intervening time In this survey 191 infants were examined

INCIDENCE OF DISEASE AND *Bact coli* D 433 IN MATERNITY UNIT A

From the time the first cases of neonatal diarrhœa and vomiting were recognised in Maternity Unit A,



until the first part of the investigation was completed three weeks later, the total number of infants at risk was 144 12 of these were in the premature unit and 10 of them became ill Of the 132 in the main block, 7 became ill.

Premature Unit

At the time the first 2 infants in the premature unit were found to be sick there were 7 others at risk, and during the next five days 3 more were admitted, making a total of 12 The accompanying chart shows the dates of the onset of illness in this group As all these infants had spent twelve to twenty four hours in the nursery of the main block before being transferred to the premature unit, it is possible that the infection was contracted in the main block But it is equally likely that one or more of the early cases was infected in the main block and carried the infection into the premature unit It will be seen from the chart that cases occurred at a fairly regular rate until March 12, by which date the 2 babies who remained well had been discharged A profuse growth of *Bact coli* D 433 was obtained from all the 10 infants who developed diarrhœa and vomiting The 2 who remained well were both negative

As the infants were swabbed only at intervals of approximately seven days, accurate correlation between the onset of the disease and the time at which the stools

TABLE I—SICK INFANTS IN PREMATURE UNIT RESULTS OF EXAMINATION OF RECTAL SWABS FOR *Bact coli* D 433 IN RELATION TO ONSET OF ILLNESS

Case no	Age at onset of illness (days)	Result of swab before onset		First swab after onset	
		Days*	*B coli*	Days*	*B coli*
1	28	Ill before investigation began		+6	Pos
2	13	Do		+3	Pos
3	15	Do		+5	Pos
6	14	−7	Neg	+2	Pos
7	16	−7	Neg	+2	Pos
8	17	−8	Neg	+1	Pos
4	16	−3	Pos	No swab obtained†	
5	10	−3	Pos	Do †	
9	11	−3	Pos	+4	Pos
10	11	−3	Pos	No swab obtained‡	

*Days counted from day of onset of illness reckoned as 0
†Died before next swabbing of unit.
‡Removed by parents on day after onset

became positive for *Bact coli* D 433 is not [illegible] However, as indicated in table I, 6 were found at intervals varying from one to six days after Further positive swabs were obtained in all these Of these 6, 3 had been swabbed previously and negative, the interval between swabbing and the of disease being seven days in 2 cases and eight days the other The remaining 4 were all found positive [illegible] days before the onset of diarrhœa and vomiting

The 2 infants who remained well spent sixteen [illegible] twelve days in the unit Two rectal swabs were taken from each and all were negative for *Bact coli* D 4[illegible] The last were taken three days before discharge and the day of discharge respectively

The Main Block

During the investigation 7 infants in the main [illegible] became ill, all having been in the nursery from birth Of these cases 4 occurred between Feb 26 and March [illegible] when the nursery was closed to further admissions The other 3 occurred between March 8 and 18 after which no infants remained who were not already ill Between Feb 26 and March 18, 28 infants had been at risk in the nursery None who had been nursed in the ward with their mothers during this period became ill while in hospital

Rectal swabs, taken after the start of symptoms (table II) from all the 7 infants who became ill in the nursery, were positive for *Bact coli* D 433 Of these only 2 had been swabbed previously and these had been found negative one day and seven days before the illness

TABLE II—SICK INFANTS NURSED IN NURSERY OF MAIN BLOCK RESULTS OF EXAMINATION OF RECTAL SWABS FOR *Bact coli* D 433 IN RELATION TO ONSET OF ILLNESS

Case no	Age at onset of illness (days)	Result of swab before onset		First swab after onset	
		Days*	*B coli*	Days*	*B coli*
13	17	Ill before investigation began		11	Pos.
14	18	Ill before swabbed		1	Pos.
15	11	Do		1	Pos.
17	5	Do		2	Pos.
18	6	Do		2	Pos.
16	4	−1	Neg	2	Pos.
19	10	−7	Neg	Day illness started	Pos

*Days counted from day of onset of illness reckoned as 0

On discharge 12 healthy babies (8 in the nursery and in the wards) had positive rectal swabs, but, as will be shown later, 7 of these became ill at home Negative rectal swabs were obtained on discharge from [illegible] infants who had remained well, 58 of them had been swabbed twice Of the 112, 107 were finally swabbed on the day of discharge and 5 at intervals up to five days before discharge (Mean age 10 7 days range [illegible] days) No growth was obtained from the swab of other infant at discharge (see below)

INCIDENCE OF DISEASE AND *Bact coli* D 433 AFTER DISCHARGE FROM MATERNITY UNIT A

Of the 12 infants discharged with rectal swabs positive for *Bact coli* D 433, 7 became ill within nine days [illegible] all but 1, who died at home three days after discharge were reswabbed and again found positive The other remained well during the follow up period

Two infants who had been discharged from the nursery of the main block before the start of the investigation became ill at home and were admitted to the Hey Children's Hospital, where rectal swabs, taken within ten minutes of admission, were positive for *Bact coli* D 433

Of the 62 infants contacted personally or by [illegible] 25 had rectal swabs taken on attendance at clinic

a period between four and thirty four days (16 the tenth day) after discharge Of these, 2 had e positive, but neither they nor the other 23 ped any signs of illness The twin (case 29) of one 2 positive infants was ill with diarrhœa and ng and was admitted to Alder Hey Children's tal where he was found to be positive for *Bact coli* 3 His swab on discharge was the one which had

III—NUMBER, DISTRIBUTION, AND MORTALITY OF CASES

sult	Sick in main block	Sick in premature unit	Sick after discharge	Total
	3	5	5	13 (43 5%)
ered	4	5	7	16 (53 3%)
nown	—	—	1	1 (3 0%)
al	7	10	13	30 (100 0%)

aced no growth and he had not been included in the ifants selected at random None of the remaining the control group developed any illness

the group of 51 infants who were not followed up, re admitted to hospital with diarrhœa and vomiting within eight days of discharge from the maternity Of these, 2 were admitted to Alder Hey Children's pital (cases 20 and 29), and rectal swabs taken immedi y after admission were positive The other 2 (cases and 25) were admitted to an isolation hospital in city, and rectal swabs taken one and three days ectively after admission were also positive *

hough it is possible that several others discharged ative for *Bact coli* D 433 might have become positive, think it unlikely that any admitted to hospitals gastro enteritis were missed Furthermore, in the up that we could not follow up, 4 (out of 51) became which is a higher proportion than was found in the trol group (none out of 62)

o summarise Of the total of 37 infants who were nd to have rectal swabs positive for *Bact coli* D 433 ring this part of the investigation, 30 became ill ble III) and none of those with negative swabs did so e 62 infants picked at random from the 112 discharged h negative rectal swabs remained well for at least urteen days after discharge Of these 62, 25 had further tal swabs taken, 2 were found to be positive but ther of these infants became ill Of the remaining 50 o were negative on discharge, 3 became ill and were nitted to hospital where they were then found to re rectal swabs positive for *Bact coli* D 433 One int with no growth on discharge later became ill and found to be positive also The 2 who did not develop rrhœa and vomiting while in the premature unit ained well after discharge

VEY OF INCIDENCE OF *Bact coli* D 433 IN MATERNITY UNIT B

During a period of four weeks, 210 rectal swabs were en from 191 infants (Mean age 7 4 days range 4 days) Of these, 4 infants in different wards were nd to be positive They developed no illness while in pital nor during a fourteen day follow up There no gastro enteritis in this unit either during, or for month before and after, the swabbing

everal months before, there had been sporadic bbing of newborn infants in this maternity unit infants (mean age 8 2 days range 4–18 days) had n swabbed, and none had been positive There was diarrhœa or vomiting in the unit

bles summarising the particulars of each case have been multi graphed and are obtainable on application to THE LANCET Office 7 Adam Street, London W C 2

SURVEY OF INCIDENCE OF *Bact coli* D 433 IN MATERNITY UNIT A AFTER A DISEASE FREE INTERVAL

All the 55 infants in the main block five and a half weeks after the last case of diarrhœa and vomiting had occurred in the unit were swabbed (Mean age 6 9 days range 1–23 days) All were negative for *Bact coli* D 433 At the same time the babies in the premature unit were swabbed Of the 11 infants in the unit at the start, 5 who had been kept there for twenty six days or more were positive During the following seven weeks the infants in the unit were reswabbed twelve times 4 others became positive before the organism finally disappeared, two and a half weeks after swabbing was resumed The total number swabbed in this period was 25 and all remained well while in the unit and for fourteen days after discharge

FEEDING AND INFECTION

Of the 144 infants ill or at risk during the investigation, 110 were fully breast fed except for small amounts of glucose saline during the first twenty four hours, in the remainder the child was fed partly or entirely on pooled expressed breast milk or dried milk (table IV(*a*)) Of the breast fed, only 5 (4 5%) became ill, whereas 23 (68%) of the 34 who did not receive their feeds directly from their own mothers developed diarrhœa and vomiting

Of the 28 infants in the nursery (table IV (*b*)), 11 were fully breast fed and only 3 (27%) became sick, but of the 17 who were fed by other methods, 11 (65%) developed the illness It should be noted that 13 (82%) of the latter

TABLE IV—INFECTION IN RELATION TO METHOD OF FEEDING

Feeding method	Total	Well	Sick	*Bact coli* D 433 positive
(*a*) *Complete Maternity Unit A*				
Breast fed	110	95 5%	4 5%	8 2%
Other methods*	34	32 2%	67 8%	77 0%
(*b*) *Main Block Nursery*				
Breast fed	11	72 5%	27 5%	45 5%
Other methods	17	35 3%	64 7%	82 5%

*Breast milk plus dried milk 14 breast milk plus expressed breast milk 7 dried milk 5 expressed breast milk 8

group became positive for *Bact coli* D 433, but only (45%) of those fed directly from the breast

CLINICAL FEATURES

Of the 30 infants who became ill, 14 were 5 lb 8 oz or under at birth, and only 6 of these were fed directly from the breast The clinical picture varied from that of a mild illness, with little constitutional disturbance, to an illness of great severity Of the moderately severe or severe cases in which the child neither died nor was treated with aerosporin, the average duration was twelve days (shortest eight and longest twenty five days) The characteristic first symptom was an unexplained failure to gain weight, or even a loss of weight Each of the 17 infants who developed the disease while in Maternity Unit A lost weight, either continuously from birth, or for one to five days before the onset of diarrhœa and vomiting Reluctance to feed was noted in 11 of the 17 infants before diarrhœa and vomiting commenced, but all had anorexia once the disease was fully developed

Diarrhœa and vomiting started simultaneously in 11 cases diarrhœa preceded the vomiting by twelve to twenty four hours in 11 and vomiting came first in 8 The stools, which were generally watery, varied in colour from bright yellow to green, the presence of mucus was fairly constant A seminal smell was common but not invariable (Beavan 1944) In the severe cases dehydration

developed rapidly, and sometimes it preceded diarrhœa and vomiting All the severe cases became listless and apathetic, with greyish pallor, early in the illness—more so than could be accounted for by dehydration alone These features were regarded as a "toxic" manifestation Pyrexia was inconstant

When the infants received intravenous therapy they usually showed considerable improvement, but they tended to relapse when again given milk by mouth, they became reluctant to take a feed and their vomiting and diarrhœa, with dehydration, recurred Reluctance to feed was deemed a significant prognostic feature for two reasons (1) that so long as it persisted there was a definite risk of relapse, indicating that the disease process was continuing even if diarrhœa and vomiting had abated, and (2) that its cessation—usually suddenly in twelve hours or so—was an almost certain sign that the illness had run its course and that the infant had entered the convalescent phase It will be shown in a later paper that in infantile (including neonatal) gastro enteritis a "toxic" appearance, a tendency to relapse, and a reluctance to feed have been almost always associated with the presence of *Bact coli* D 433 in the stools, they were rarely found in cases of diarrhœa and vomiting from which this strain was not isolated

Evidence of a local infection was present at the onset in 7 infants (umbilical sepsis 1, ophthalmia 1, paronchyia 1, and oral thrush 4) A secondary infection occurred during the course of the illness in 7 cases (thrombophlebitis of veins used for intravenous therapy 4, acute suppurative otitis media 2, mastoiditis 1, and paronchyia 1) One infant developed a hæmorrhagic tendency which ceased when 'Synkavit' was given Of the 30 infants who became ill, 13 are known to have died (43%), of the 14 premature infants (4 were in the main block nursery), 50% died, and of the 15 who were full term, 40% died The remaining infant, whose ultimate fate is unknown, was sufficiently ill for intravenous therapy to be thought necessary, but his mother refused hospital treatment and we failed to make further contact

There is little difference between the death rates of the mature and premature infants in this series Aerosporin was given to 7 infants 2 died but the other 5, who received it two to twelve days after the onset of diarrhœa and vomiting, showed striking improvement within twenty four hours Of the 13 fatal cases death was attributed directly to gastro enteritis in 8 and to secondary infection as a complication of gastro enteritis in 3 The complications were as follows aspiration broncho pneumonia and septicæmia 1, mastoiditis 1, and septicæmia following thrombophlebitis 1 The other 2 infants died suddenly after aspiration of a feed or vomit

There was no significant illness in the mothers or staff during the course of the outbreak

PATHOLOGICAL FINDINGS

Necropsy was performed by us on 5 of the 13 infants who died (cases 2, 4, 14 22, and 24) In 4 cases no gross change was found in the intestine, apart from mucosal congestion, but in the 5th case (no 22), where there had been much abdominal distension before death, the small intestine (especially the ileum) was grossly dilated, the mucosa showing many areas of necrosis and hæmorrhage, with numerous gas vesicles in the submucosa and muscularis

Bact coli D 433 was isolated from stomach and intestine in 4 of these cases, the negative one had ceased to have diarrhœa and vomiting two days before death, but had developed a thrombophlebitis and septicæmia, and had aspirated regurgitated stomach contents into the lungs Mesenteric lymph nodes were either normal or slightly enlarged and congested The middle ear clefts were abnormal in only 1 case (no 24), both cavities contained pus from which *Strepto* and *Bact coli* D 433 were isolated The livers were normal macroscopically, microscopically limited to slight congestion and (in 1 case) slight portal lymphocytic infiltration It has often that since plasma and protein hydrolysates have used in the treatment of infantile gastro enteritis, fatty infiltration of the liver has been found commonly Changes in the brain were limited to congestion of the pia arachnoid vessels and œdema of meninges There was no evidence of lesions like described by Christensen and Biering Sorensen (19

SECOND OUTBREAK OF DIARRHŒA AND VOMITING MATERNITY UNIT A

During September and October, 1949, another break of neonatal diarrhœa and vomiting occurred Maternity Unit A, but it was remarkably different

TABLE V—PRINCIPAL FEATURES OF THE TWO EPIDEMICS

Features	1st epidemic	2nd epidemic
Fully breast fed	20 0%	50 0%
Initial weight loss or failure to gain	100 0%	100 0%
Diarrhœa	100 0%	100 0%
Vomiting	90 0%	15 5%
Anorexia	90 0%	1 5%
Toxic ' appearance	90 0%	0 0%
Relapse	Very common	None
Average duration of illness	1° days	5 days
Mortality rate	43 0%	0 0%
Bact coli D 433 in stools	100 0%	0 0%

the previous one (table v) There were 16 cases and deaths

As in the first outbreak, the presenting symptom was an unexplained failure to gain weight, or an actual loss This was followed after a day or so by the passage of relaxed or watery stools, occasionally but not often with mild vomiting The diarrhœa lasted for two to three days, and only in 2 cases for as long as five days The infants remained bright throughout and never looked "toxic", only 2 were reluctant to take feeds and these caused no anxiety Intravenous therapy was required by 4 babies for one to two days, after which they made satisfactory progress Of the remaining 12, 3 had glucose saline by mouth for twenty four hours and were able to continue normal feeding After this, graduated feeds consisting mostly of diluted expressed breast milk, caused rapid gains in weight, it was common to see an increase of 10–12 oz in five days Only 2 infants were slow to respond The average duration of the illness was five days and no case relapsed

Rectal swabs were taken from 12 of the 16 infants in the illness, and *Bact coli* D 433 was never isolated There was no notable illness of any sort in the staff or mothers at the time In contrast with the first epidemic, breast fed babies (8) were affected as often as artificially fed

PATHOGENICITY OF *Bact coli* D 433 IN ADULTS

Two experiments were undertaken with adult volunteers who had not handled *Bact coli* D 433 The organism used had been isolated eleven months previously from a severe case of infantile gastro enteritis and had been used for the preparation of the agglutinating serum employed throughout the investigation We had two subcultures derived in different ways strain A was taken from subcultures kept for long intervals on agar plates at room temperature, while strain B was a fresh recent subculture of the refrigerated agar slope stock culture

Before ingestion, all strains were grown for three days subculturing each day, in 0 05% agar, incubated at 37°C in 10% CO. The dose administered in 0 2 ml

agar was approximately 2000 × 10^6 organisms
1 eighteen hour culture

xperiment

) volunteers were divided into three equal groups
) I were given a dose of strain A
) II were given a dose of strain B
) III (controls) were given a similar volume of
lated incubated medium

1 case the dose was given in milk one to two hours
inch and the volunteers were kept in ignorance of
rouping Of group I, 2 suffered mild abdominal
fort late the same evening, 1 having several loose
, but on the following morning all 3 had diarrhœa
bdominal discomfort, the stools numbering from
o eight There was mild anorexia but no vomiting
oms abated during the afternoon and the volun
were back to normal next day The fæces of all
volunteers showed profuse growths of *Bact coli*
3 twenty hours after taking the culture, and 2 were
ositive on the next day, the last positive in this
(I) was at four days None of group II developed
oms 2 had positive swabs four days after the
but not thereafter The control group (III) was
ive throughout
um agglutination tests were performed in each
with sera from all the subjects), against living and
l suspensions of *Bact coli* D 433, and again two
s later with serum from those that were ill In all
nces the titre was less than 1 in 10

id Experiment

e second experiment was on similar lines but used
rent persons Strain A was taken by 3 volunteers
the other 6 took two different strains of typical
l *Bact coli* that did not show any serological or
nemical relationship to *Bact coli* D 433 Of the 3
took strain A, 1 was ill, the symptoms resembling
e in the first experiment but with vomiting in
tion The other 2 and the 6 controls remained
ctly well

cause of the shortage of suitable volunteers we were
ble to amplify these experiments, but we are investi
ng possible differences between strains A and B

DISCUSSION

he term neonatal diarrhœa and vomiting is applied to
mber of syndromes differing in their clinical manifes
ons and probable ætiology A review of the literature
gests that there are at least six main groups

Outbreaks due to accepted pathogens such as dysentery or salmonella organisms

Epidemics in which the mortality-rate is high, and the spread of the disease rapid, among the infants at risk, but adults are unaffected The clinical picture in these outbreaks has been remarkably similar—namely, pronounced loss of weight, anorexia, toxæmia, diarrhœa and vomiting, severe dehydration, and a tendency to relapse (Craig 1936, Frant and Abramson 1938, 1947, Ormiston 1941, Sakula 1943, Gairdner 1945, Stern 1947) Our first outbreak seems to fall into this group

Outbreaks in which diarrhœa is the dominant symptom and vomiting is uncommon In these the infants rarely appear ill, there is no toxæmia, anorexia, or tendency to relapse, and intravenous therapy is seldom required (Baker 1939, Lembcke et al 1943) Our second outbreak belongs to this group

Those in which diarrhœa has also affected adults In the outbreak described by Ensign and Hunter (1946) there was a high mortality-rate in the newborn, and *Pseudomonas aeruginosa* was implicated The outbreak reported by Brown et al (1945) also affected adults, but the disease was mild, with a low mortality-rate in the infants, a virus infection was suspected.

Epidemics of neonatal diarrhœa and vomiting associated with an influenzal type of illness in the mothers and nursery staff (Lyon and Folsom 1941) The outbreak of this nature described by Colvin and Emory (1941) had a high mortality rate among the infants, and necropsies on them revealed hæmorrhagic pneumonia

6 The outbreaks investigated by Buddingh and Dodd (1944) also involved adults as well as the newborn infants and there was stomatitis, of characteristic type, besides the diarrhœa These authors produced experimental evidence suggesting that a virus was responsible

The bacteriological findings in group 2 have been diverse A large number of organisms have been implicated but in most of these epidemics the bacteriological examination of patients, and especially of contacts and controls, has been inadequate In at least one group of outbreaks, however, strong evidence of virus ætiology has been produced (Light and Hodes 1943, 1949) In the outbreaks described by Giles and Sangster (1948) and Taylor et al (1949), a close association between the illness and *Bact coli* D 433 in the stools was demonstrated

Early in our investigation of the association of *Bact coli* D 433 with cases of infantile diarrhœa and vomiting admitted to Alder Hey Children's Hospital it became apparent that the severe and toxic type of case, with its habitually to relapse, rarely occurred without *Bact coli* D 433 being present in the stools This did not hold true for other clinical types of diarrhœa and vomiting, and in fact severe diarrhœa and vomiting which responded rapidly and permanently to intravenous therapy within two days was uncommonly associated with this strain In other words, a clinical syndrome which can be recognised as a separate entity (whether parenteral infection is present or not) had a very close association with *Bact coli* D 433 The clinical picture of the severe cases encountered in our first epidemic, and, for the most part, of those discussed in group 2, is similar to this

In our first epidemic all the 30 cases were associated with *Bact coli* D 433 and none of the 109 infants who remained negative developed diarrhœa or vomiting It is notable that only the 2 healthy babies in the premature unit were negative, and that the 10 ill babies were all positive It is true that 7 infants who were infected with the strain never became ill, but, even if we assume that the total number of symptomless positives was twice as large, the ratio of sick to well (though positive for *Bact coli* D 433), would be 2 1 which is by no means an unusual finding in salmonella outbreaks Thus Irvine and Galvin (1949) found during an outbreak of paratyphoid fever that of 13 persons infected with *S paratyphi* B 6 never developed symptoms of the disease and Rubbo (1948), investigating an outbreak of infantile gastro enteritis due to *S derby*, found 21 apparently healthy carriers to 47 clinical cases

It seems unlikely that *Bact coli* D 433 is a normal commensal in the neonatal or infant population as a whole for Taylor et al (1949) could not find it in 79 healthy non-contact newborn babies, and we found it only 4 times in 224 Similarly, investigating healthy non-contact infants under the age of one year, Giles et al (1949) and Taylor et al (1949) have between them found this organism in less than 2% of approximately 370 infants and we failed to isolate the strain from the rectal swabs of over 380 It might be argued that *Bact coli* D 433 was a commensal in the unit at the time of the outbreak but, if this was so and if 100% of the sick infants carried the strain, far more than 6% of the remainder should also have been carrying it It could also be postulated that the organisms existed in small numbers in the guts of healthy infants, and that they were excreted in numbers sufficient for recognition only when diarrhœa started, but profuse growths of the strain were obtained from the rectal swabs of the 11 infants examined

before any diarrhœa (table I) had occurred Furthermore, the strain was never found, even in small numbers, during the second outbreak, and as stated in the bacterio logical appendix we were able to recognise, on primary plates, scanty numbers of colonies likely to be *Bact coli* D 433 among large numbers of *Bact coli* colonies which were not of this serological type

We regard these facts as circumstantial evidence that *Bact coli* D 433 was not only closely associated with diarrhœa and vomiting in the first epidemic but was probably responsible for it, either alone or in close symbiosis with some other agent It should, however, be noted that during the postepidemic period, when the babies in the premature unit were repeatedly swabbed, 9 of the 25 in the unit became positive for varying periods without any sign of illness It might therefore be suggested that the disease was caused by an intimate symbiosis between *Bact coli* D 433 and some other agent, which was eliminated in the postepidemic period But in other outbreaks where *Bact coli* D 433 was found there has been no evidence of an associated bacterium or virus (Giles and Sangster 1948, Taylor et al 1949) We are not in a position to confirm these findings, apart from noting the complete absence of salmonellæ and shigellæ, and a lack of correlation between the disease and organisms of the paracolon group Though experi mental evidence is scanty, it has often been suggested that outbreaks of disease are associated with phases of enhanced virulence of the causal organisms (Topley and Wilson 1946a) Variation in virulence of a given salmonella strain is discussed, as regards infants, by numerous workers—e g, Angrist and Mollov (1946), Mackerras and Mackerras (1949), and Mackerras and Pask (1949) Similar variation in virulence might occur with *Bact coli* D 433 or similar strains, and, as Mackerras and Pask (1949) said of salmonellæ, "we suspect that pathogenicity is associated either with dosage of infection or, more probably, with selection by passage of virulent mutants"

Our experiments with adult volunteers suggest that this organism may produce diarrhœa when ingested in a dose comparable to that required with *S typhi murium* (Hormaeche et al 1936)

We were unable to study the mode of spread of the organism, but table IV shows a high degree of correlation between diarrhœa and vomiting and the presence of *Bact coli* D 433 on the one hand and methods of feeding (other than breast milk direct from the breast) on the other Infants fed with expressed breast-milk were just as liable to develop the illness as were those having artificial feeds The disease did not break out in the wards where the infants were wholly breast fed, even though initially they were bathed and weighed in the nursery and not infrequently by the nursery staff It can, of course, be argued that infants in the nursery formed a more susceptible population, all being there primarily because they were not completely normal But as can be seen from table IV(*b*) the incidence of illness and *Bact coli* D 433 in breast fed infants in the nursery is very much lower than in those partially or entirely fed by other means

SUMMARY AND CONCLUSIONS

Two outbreaks of neonatal diarrhœa and vomiting are described In the first, 30 cases were recognised, and *Bact coli* D 433 was recovered from the rectal swabs of all The case mortality rate was 43% The second outbreak involved 16 babies without a death

The clinical syndromes encountered in the two out breaks were quite different The one associated with *Bact coli* D 433 was characterised by diarrhœa and vomiting, anorexia, toxæmia, and a liability to relapse, but the outbreak not associated with this organism was of a relatively mild illness with diarrhœa and little vomiting, no evidence of toxæmia, and no to relapse

The incidence of the organism in 224 healt contact newborn controls was less than 2%, and in 350 healthy non contact infants less than one it was nil

Ingestion of the organism by adult volunteer comparable illness

It is suggested that the first outbreak was caus *Bact coli* D 433—possibly in symbiosis with some agent—and that other epidemics with similar features may well be due to the same serological of *Bact coli* or a similar one

The syndrome should be recognisable not on seen in epidemics but also among the welter of infantile diarrhœa and vomiting treated in a hospital.

We gratefully acknowledge indebtedness to all who helped us in particular to Prof Norman B Capon Prof A W Downie for their encouragement and criticism, to Dr H H MacWilliam and Dr F P medical superintendent and pædiatrician respectively hospital where the epidemics occurred, and to Dr Bell (senior assistant medical officer i/c maternity and welfare, Liverpool), Dr J F Swan (medical officer Bootle), Dr J G Hailwood (divisional medical Lancashire), and Dr A B Christie (medical Fazakerley Fever Hospital) for assistance with information about infants discharged from the maternity unit Dr Taylor and Dr C Giles kindly supplied sera, and cultures the organisms isolated by them

Especially would we like to express our thanks to nursing staffs of all the hospitals concerned, but for help this work could never have been done

Bacteriological Appendix

TERMINOLOGY

The sera used in this investigation were prepared from strain of *Bact coli* isolated from a fatal case of infant gastro enteritis in Alder Hey Hospital This strain (Stock and "OK" and "O" antisera prepared from it by method of Kauffmann (1944), gave complete reciprocal tion with a strain of "*Bact coli neapolitanum* type supplied by Dr C Giles, and its corresponding similarly prepared This organism is said by Giles to identical with the strain of *Bact coli neapolitanum* by Bray (1945) Though the identical antigenic structur Stockton and a strain of '*Bact coli* D 433" supplied Dr Joan Taylor was not established by similar cross-ab tion until the investigation was almost completed, we h preferred to use this noncommittal term to avoid the some 'specific serological type of *Bact coli* var *neapolita* Furthermore we know that other serologically different str coming within the biochemical definition of *Bact coli* r *tanum* occur, and should they in the future be found to h clinical significance, difficulty with nomenclature would

ISOLATION OF *Bact coli* D 433

All specimens, taken by rectal swab moistened wi glucose broth, were plated out as soon as pos MacConkey agar and desoxycholate-citrate agar At start of this investigation we had decided to give attention to *Bact coli* D 433, and because of limited time, neither microscopy of specimens nor special med salmonellæ, monilia, staphylococci, or streptococci were Desoxycholate plates were examined at 18 and 48 h non lactose fermenting colonies were picked off for f examination the number of colonies depending on the n of different colonial forms MacConkey plates were ex with a hand lens after 18 hours incubation and slide a tinations were carried out on all types of lactose ferm colonies using a D 433 'OK" serum. We have fo possible on our MacConkey medium to recognise pr colonies of *Bact coli* D 433 with considerable accuracy 18 hours' incubation, they are in general of smaller with a more regular edge a finer texture and a pale colour, than negative colonies From each plate four colonies were tested including if present, at least two we considered on colonial appearances not to be *Bact* D 433 Occasional colonies of the type mentioned

LE VI—DISTRIBUTION OF NON LACTOSE FERMENTING BACILLI IN GROUPS SWABBED

s d	Place and time of swabbing	Cases in which non lactose fermenters were isolated		
		Para colon bacilli	Proteus group	Others
ell	Maternity unit during epidemic	29	5	*Bact alkaligenes* 1 *Ps pyocyanea* 1
1	First swab obtained after start of illness	5	2	0
ell	Control maternity unit	5	8	*Bact alkaligens* 4 *Ps pyocyanea* 1
ell	Main block of maternity unit after outbreak	9	0	0
ell	Premature unit after outbreak	3	5	0

d negative on slide agglutination, but colonies of other never proved positive

m each plate giving positive or doubtful slide agglutina a pure culture from two colonies was examined for ity in 6 hour peptone water culture, for indole pro on, and for fermentation of sucrose salicin and dulcite ier slide agglutinations from agar slopes were also d out Afterwards at least one colony from each t was examined further biochemically and serologically

CIFICITY OF PRIMARY SLIDE AGGLUTINATION REACTION

177 colonies giving a positive or doubtful primary slide ion 163 when examined as mentioned above gave the iemical reactions of *Bact coli* D 433 and a clear-cut slide itination from an agar slope with the ' OK " serum The r 14 were negative in both respects In the course of other : 150 colonies giving a negative primary slide reaction carried through in the same way all were negative

FURTHER IDENTIFICATION

urther biochemical tests were made on 57 strains—at 1 from each infant with a slide positive stool culture ose glucose maltose, and mannitol were fermented, acid and gas production, within 24 hours Other sugars more variable raffinose requiring 1-3 days, dulcite 2-4 sucrose 1-5 days and salicin 2-6 days for fermentation nite was not changed after 8 days All strains were non ile citrate and V.P negative and indole and M R positive he 57 strains were tested by tube agglutination at 37°C 20 hours (a) living against the ' OK ' serum, titre 1/640, (b) after boiling for $2^1/_2$ hours against the " O ' serum 1/5120 All strains were agglutinated to titre by both - Absorption of the ' OK " serum was carried out with living strains All reduced the titre to less than 1/40, inst the homologous and absorbing strains

PROFUSENESS OF *Bact coli* D 433

n all cases the fæcal cultures at the beginning of the ess showed profuse growths of *Bact coli* D 433 Growth of organism from swabs taken either before the illness ted or from the few positive infants who remained well often as profuse as at the beginning of the illness.

INCIDENCE OF COLIFORM BACILLI

he incidence of coliform bacilli in the rectum of newborn dren has recently been investigated by McFarlan et al 9) For purposes of comparison the following figures te only to infants in the age range 3-11 days all fully ist-fed at the time of swabbing

ernity unit during epidemic	98% of 93 infants
ernity unit after epidemic	100% of 44 infants
trol maternity unit	82% of 133 infants.

here was no difference in the isolation rates of coliform illi during and after the epidemic in Maternity Unit A, there is a significant difference between the isolation rates he two units investigated. ($\chi^2 = 19.5$ n=1, P = <0.001) ie of the infants in Maternity Unit A had received ose saline during the first 24 hours The comparable res in the series of McFarlan et al (76% of 28 infants) e well with our control figure of 82% of 133 infants The erence in incidence of diarrhœa and vomiting between infants fed directly from the breast and those fed by other means was not related to the total incidence of coliform bacilli

INCIDENCE OF NON LACTOSE FERMENTING COLIFORM BACILLI

No organisms of the salmonella or shigella groups were isolated during this investigation. Table VI shows the incidence of other non lactose fermenting bacilli Though in the maternity unit investigated both during and after the outbreak paracolon bacilli were more frequent than in the control series their distribution was not related to the distribution of diarrhœa and vomiting

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TRANSVESICAL SUPRAPUBIC PROSTATECTOMY WITH CLOSURE OF THE BLADDER

REVIEW OF 40 CASES

B E CRAWFORD STANLEY

M.B Lond , F R C S

ASSISTANT, SURGICAL UNIT, ST MARY'S HOSPITAL, LONDON

THE prostatectomies reviewed here were done by two surgeons for benign enlargement of the prostate The patients were consecutive admissions to the surgical unit of a London teaching hospital and are unselected, except that there was no blood urea level higher than 112 mg per 100 ml in the series The average age of the patients was 69 8, the youngest 54, and the oldest 82

All the cases have been followed up for six to eighteen months after operation

OPERATION AND POSTOPERATIVE MANAGEMENT

The operation used is a simple one Under general anæsthesia a suprapubic subumbilical incision is made and the bladder opened at the fundus The prostate is enucleated as for a Freyer's operation, and the cavity immediately packed with gauze A retractor of the type shown in fig 1 is inserted into the bladder With the tip of the retractor depressing the bladder base, the packed prostatic cavity is compressed against the symphysis pubis (fig 2) Pressure is maintained for three or four minutes and, when the packing is removed, it is found that the ooze of blood from the prostatic cavity is considerably diminished Any tags of mucosa round the internal urinary meatus are then trimmed, and

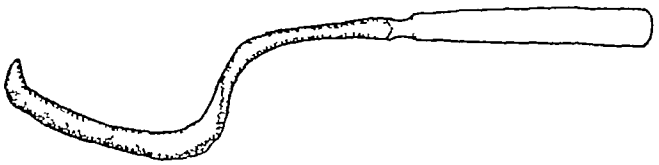

Fig 1—Retractor used in transvesical suprapubic prostatectomy 1/3 actual size

obvious and easily accessible bleeding points ligated with fine catgut or coagulated by diathermy Much time is not spent on this manœuvre A 22 (F) McCarthy catheter is passed along the penis into the bladder The catheter is depressed posteriorly with a retractor, and two or three plain catgut sutures are inserted to approximate the anterior part of the lateral borders of the internal urinary meatus Each stitch takes a bite of about half an inch of tissue These stitches do not pass as deeply as the anterior stitch described by Harris (1930,1934) Sufficient are inserted to make the edges of the internal urinary meatus fit snugly round the catheter (figs 3 and 4) At the conclusion of the manœuvre adequate hæmostasis is obtained

The catheter is then adjusted so that no eye lies in the prostatic cavity, and is fixed to the anterior wall with Esmay buttons The bladder wall is sutured in two layers, a small drain is left in the cave of Retzius, and the parietes are closed

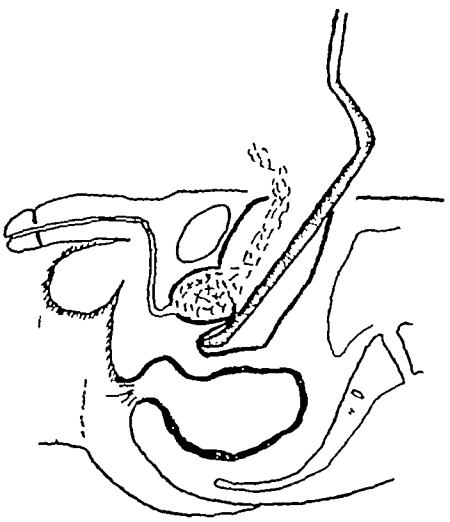

Fig 2—After enucleation of prostate hæmostasis is achieved by depressing the base of the bladder and compressing the packed prostatic bed against the symphysis pubis

After operation, tap-water is given per rectum by Murphy's method to combat shock. For irrigations through the catheter no hard and fast rule is laid down, it is left to the judgment of the nurses Irrigations of one or two ounces of sterile saline solution are required hourly for the first few hours and subsequently at longer intervals The catheter is left in situ for five to seven days, and the patient discharged soon after These patients are not hurried out of hospital

All the patients receive 250,000 units of penicillin twice a day and sulphadimidine from the time of operation until twenty four hours after the catheter has been removed

CONDITION TREATED

29 patients were admitted for a planned operation 7 were admitted with acute retention, 4 of these were operated on immediately without passage of a catheter, and the other 3 treated with catheter drainage for from two to five days before operation 4 patients had a suprapubic cystotomy some time before

In addition to the prostatectomy, stones were removed from the bladder of 1 patient, three sacculi from the bladder wall of 1 other, and 2 other patients had papillomata of the bladder fulgurated

RESULTS

1 patient died, on the fourth day after a cerebral thrombosis either during or immediately after operation Postoperative complications are summarised as follows

Clot Distension of Bladder—There was no case of this condition demanding more than the use of a bladder irrigator in the ward

Suprapubic Fistula—Suprapubic fistula developed in 3 cases after the removal of the urethral catheter healed in three, four, and eight days

Secondary Hæmorrhage—Slight secondary hæmorrhage occurred in 3 cases Of these 1 demanded no treatment the other 2 were treated by replacement of the catheter three days

Epididymo-orchitis—In this series vasotomy was not done In spite of the administration of penicillin and sulphonamides 16 patients developed epididymo-orchitis

The results six to eighteen months after operation were

General Health—30 patients reported feeling fitter than before the operation, 8 admitted to no noticeable change, and 1, who had post-prostatectomy obstruction, was not so well

Micturition—8 patients reported that they did not rise at night to micturate, 9 rose not more than once, 20 rose not more than twice, and 2 rose three times 35 patients reported that they passed a stream of urine as freely as they did when young, 3 said they micturated comfortably but not with great force, and 1 (post prostatectomy obstruction) said that he micturated only with straining 23 patients had less than one ounce residual urine, 14 between one and two ounces, and 2 more than two ounces

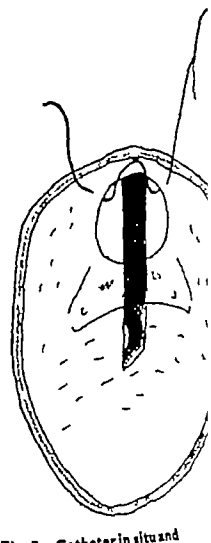

Fig 3—Catheter in situ and of first stitch.

Urine—Of 16 patients with sterile urine before operation 15 had sterile urine at follow up The urine of the 1 gave a moderate growth of coliform bacilli, but the functional result was very satisfactory Of 23 patients who had infected urine before operation, 12 had sterile urine at follow up The remainder were still infected

Late complications were seen in two cases

Post prostatectomy obstruction followed an operation in which the anterior prostatic capsule had been torn through in the enucleation of a very adherent prostatic portion of the capsule had been removed with the prostate A hole about an inch in diameter with very ragged edges had to be repaired

A slight *meatal stricture* occurred which required dilatation on three occasions after the patient had left hospital

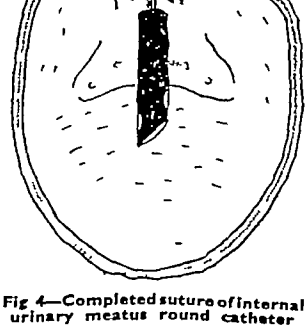

Fig 4—Completed suture of internal urinary meatus round catheter

DISCUSSION

This small series shows that a transvesical resection of the prostate, with insertion of two or three anterior hæmostatic sutures and closure of the bladder, gives satisfactory results

The only unsatisfactory feature is the occurrence of epididymo orchitis shows that, in spite of antibiotics and

y, vasotomy is still needed to prevent this cation

extravagant claims are made for this operation is simpler technically than that of Millin (1947) n easily be performed without special instruments ilities It also has the advantage that it allows manœuvres within the bladder—e g, fulguration pillomata that are inaccessible to the cystoscope, moval of saccuh—to be done at the same time

explanation of the success of this treatment t lie in the operation itself, because, in the history ostatic surgery, operations involving closure of the er have been fraught with disaster, and it is only the advent of chemotherapy and antibiotics closed operations have been widely practised It these agents that its success must be attributed

SUMMARY

cases of closed transvesical suprapubic atectomy were done with satisfactory results

e administration of penicillin and sulphonamides iot prevent epididymo orchitis in 16 of 39 patients suggests strongly that vasotomy should have done

y thanks are due to Prof C A Pannett director of the ical unit, St Mary s Hospital, for permission to include is series 21 cases on which he has operated It was at uggestion that this operation was given a trial

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CQUIRED IDIOSYNCRASY TO SODIUM *p*-AMINOSALICYLATE

JAMES CUTHBERT
M.D Glasg, F.R.F P S, D.P H
DEPUTY MEDICAL SUPERINTENDENT, BAGULEY SANATORIUM, MANCHESTER

HE toxic effects of sodium *p* aminosalicylate en for long periods in pulmonary tuberculosis are tunately rare Most workers agree that, apart from ld loss of appetite, nausea and vomiting, or occasional rrhœa there are few other dangers, but a few tances have been published of sensitisation developing h continued administration of the drug Rashes, h or without high pyrexia have been mentioned, and, ely, albuminuria or crystalluria The following case wed high pyrexia, an extensive rash followed by nplete desquamation, enlarged tender superficial nph glands, albuminuria, temporary suppression of ne, and *jaundice*, which I have not seen previously orted

CASE RECORD

' married woman, aged 28, was admitted to the sanatorium Sept 12 1949 with pulmonary tuberculosis There was istory of allergy

reatment—After a period of rest in bed an icial pneumothorax was induced on 26 but it was abandoned on Nov 22 Jan. 3, 1950, the erythrocyte sedimenta rate (E S.R.), which had been 14 mm hour in the previous month, rose to mm in 1 hour The patient was apyrexial he had been since admission, and her ght had increased by 11 lb A course of um P.A S 20 g in divided doses daily for days in each week, was begun on Jan 5 absence of nausea and vomiting was rkable

rogress—On Feb 4 the patient had a t rise of temperature (see figure) and symptoms of a cold in the head with ng limbs and back suffused face, and throat Since the pyrexia continued, was given intramuscular aqueous penicillin 50,000 units t d s She was ill, flushed, listless, and aching all over Chest radiography on Feb 10 showed no essential change

Feb 13 the patient had a rigor and projectile vomiting, and lumbar puncture produced clear cerebrospinal fluid not under pressure and containing 4 leucocytes per c mm and protein 20 mg per 100 ml A mild erythematous rash developed all over the face, neck, and extremities Penicillin was withheld but not the P.A S A blood count showed white cells 7900 per c mm (polymorphs 64%, lymphocytes 32%, monocytes 1% eosinophils 3%)

Feb 14 a Widal test was negative for the salmonella group and *Brucella abortus* Two consecutive blood cultures had been sterile The erythematous rash vanished and the patient felt better, her temperature falling to 98·4°F in the evening

Feb 15 jaundice appeared and steadily deepened Pyrexia returned P.A S was discontinued Calomel gr 2 was followed in six hours by mag sulphate gr 180 A fat-free diet and glucose in copious drinks were given In the forenoon a rash like sudamina developed on the arms and neck, this changed by the evening to an intense maculopapular rash

Feb 17 there was conspicuous jaundice, with an itching raised maculopapular rash all over the body, behind the ears, on the scalp and hard palate, and in the external auditory meati, where it caused a purulent discharge The rash was worse on the shins and absent from the palms, soles elbows, and buttocks The glands on each side of the neck and in the axillæ and groins were enlarged and tender The white cell count was now 17,900 per c mm (polymorphs 40%, lymphocytes 49%, monocytes 2%, eosinophils 9%) 'Benadryl' 50 mg t d s was given.

Feb 18 the rash more intense and the glands were still tender and palpable The patient had pains in the back and was acutely ill

Feb 20 Wassermann, Paul Bunnell, and Hess's tests were negative Thymol turbidity was 4 2 units per 100 ml The jaundice was less severe The patient s face was puffy and she still had pains in the back Examination with dark ground illumination of a fresh catheter specimen of urine showed no *Leptospira icterohæmorrhagiæ*, and the inoculation of guineapigs was likewise negative Fouchet s test for bile pigment was positive The urine contained pus cells a few red cells, and hyaline and granular casts

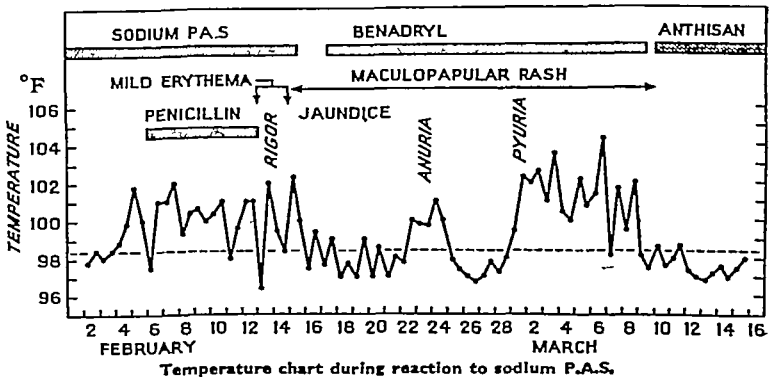
Feb 22 albuminuria was present, and examination of the blood showed Hb 100%, and white cells 18 600 per c mm (polymorphs 48%, lymphocytes 24%, monocytes 11% eosinophils 17%) The pyrexia had been decreasing since the icterus had developed on Feb 15 Jaundice was not detected in the conjunctivæ now The temperature rose again in the evening to 100°F

Feb 23 pyrexia was still present and there was œdema of the legs and arms The rash was less extensive but becoming exfoliative The liver was palpable three inches below the subcostal margin Anuria suddenly supervened in the morning and no urine was obtained by catheterisation from 4 A.M to 5 P M then incontinence of urine began and small quantities were passed The patient was extremely ill and not expected to survive Deep infra red irradiation was applied to the loins and lumbar region all day, and tinct scillæ 10 minims in water four times a day, was given until March 12

Feb 24 blood urea 18 63 mg per 100 ml

Feb 25 the temperature had fallen to normal, and the patient felt better

Feb 27 a blood count showed Hb 94%, red cells 4 730,000



Temperature chart during reaction to sodium P.A.S.

per c mm, and white cells 19,800 per c mm (polymorphs 24%, monocytes 10%, lymphocytes 61%, eosinophils 5%) The urine was acid and scalding on micturition Pot cit and sod bicarb were given regularly

Feb 27 and 28 the patient had diarrhœa, which was controlled by mist cret and kino

March 1 the patient's evening temperature was 102 4°F, and her rash was desquamating all over her body (loss on the palms and soles) The underlying maculopapular rash had gone There were still pains in the loins, but the general condition had improved The patient had been continent of urine for three days The urine contained albumin, no bile salts, no sugar, no bile pigment, many pus cells, scanty red cells, and no casts, its reaction was neutral

March 2 the rash was profusely desquamating and the patient had low back pain but felt much better in spite of her pyrexia The white cell count was 21,400 per c mm (polymorphs 63%, lymphocytes 25%, monocytes 4%, eosinophils 8%)

March 5 none of the superficial lymph glands were now enlarged Desquamation was almost completed on head, trunk, and limbs, but was starting on palms and soles

March 6 a blood count showed Hb 74%, red cells 3,780,000 per c mm, white cells 15,000 per c mm (polymorphs 71%, lymphocytes 20%, monocytes 4%, eosinophils 5%)

March 7 pyrexia was still present, and the blood urea level was 20 35 mg per 100 ml

March 9 the skin had almost finished peeling, and the maculopapular rash was returning Benadryl was discontinued, and 'Anthisan,' two 0 1 g tablets t d s, was given There was no evening rise of temperature

March 13 there was no pyrexia, the patient felt drowsy but much improved, urine was being passed freely, and all œdema of face, arms, and legs had vanished The arms and abdomen were blotchy A patch test with sodium P A S and a control was negative The dosage of anthisan was reduced to two 0 1 g tablets daily

March 17 anthisan was discontinued 'Nivea' cream was given, with benefit to the generally dry skin

March 20 there were slightly erythematous and itchy areas on the forearms and anterior aspects of the elbows A patch test with sodium P.A S on the front of the right thigh was now strongly positive after twelve hours' contact, the area covered by the patch being swollen and itching, with weeping of the skin. A control test without P A S was negative, and similar P.A S tests on other patients not receiving P A S therapy were negative

March 25 the evidence of the positive patch test was still visible as a scaly area The urine was free from pus cells and red cells, and had only a trace of albumin There were no loin pains or urinary symptoms Tests for sensitivity to penicillin and aspirin were negative

Desensitisation —On April 4 desensitisation was begun by the method used by Madigan et al (1950) After the first day slight itching erythema developed in the elbow flexures and round the site of the positive patch test, but this soon subsided, and the dosage of sodium P A S was continued The white cell count was 13,700 per c mm (polymorphs 59%, lymphocytes 24%, monocytes 7%, eosinophils 10%) The urine now contained no albumin, red cells, or casts

DISCUSSION

Unfortunately we did not watch the blood P A S levels By the time the rash and jaundice had developed and we suspected an idiosyncrasy to P A S, the veins, poor at any time, could not be induced to yield sufficient blood for estimation However, idiosyncrasy to P A S can be acquired without a high blood P A S level (Hemming and Stewart 1949) It is noteworthy that during the thirty days of P A S therapy before the onset of pyrexia the patient had no upset of appetite, diarrhœa, nausea, vomiting, or any other toxic disturbance We have gained an impression from a study of blood P A S levels in other cases that vomiting and diarrhœa tend to keep those levels low, whereas they rise in the absence of vomiting and diarrhœa

At the outset of this illness penicillin was given for eight days The same penicillin caused no ill effects in any other patients in the hospital, and later the present case showed no evidence of penicillin sensitivity

Erdei and Snell (1948) saw no toxic reaction cases of pulmonary tuberculosis treated with P they think that such reactions described may be impurities remaining in commercial not to the P A S itself.

The sodium P A S used in the present case stock solution and caused no upset apart from nausea, vomiting, and diarrhœa in any of other cases That a patch test done with sodium was so strongly positive in the present case in control patients shows that this was a case sensitivity Published reports of severe toxic to P A S therapy are scanty

Madigan et al (1950) studied 64 cases who had of sodium P A S daily with pot cit as required to urine alkaline, 32 patients had nausea and 22 had diarrhœa, and vomiting Three cases of to P A S were reported two of them showed temperatures but no skin rash, the third generalised itching skin rash followed by desquam Patch tests in this case, unlike ours, were aspirin but not for P A S The same workers, side effects of P A S, say that about half the develop some intolerance to fatty foods

Kierland and Carr (1949) reported two cases fever and pruritic erythematous eruptions due to the reactions being so severe that the drug had to discontinued They had seen two other patients skin reactions but without fever

Horne (1949) describes a case with pyrexia, face and conjunctivæ, intractable cough, and an itch erythematous blotchy rash Small doses of P.A.S. elicited the same effects, but a patch test was to P A S, and there was no eosinophilia. The pa case showed none of the intractable coughing described by Horne or by Hemming and Stewart (1 in one of their cases Horne effected successfully by increasing the doses of sodium P from 0 1 g five times a day to 15 g daily

Hemming and Stewart (1949) report a case with generalised skin irritation but no rash This patient extremely ill with fever, photophobia, nausea, heada and restlessness It was thought to be a true case acquired idiosyncrasy Their second patient had loidosis, but, under treatment with sodium P.A.S daily, excreted, after four weeks, an increased amount urinary protein, with a few red cells and numer hyaline and granular casts in the urine, and had oc transient œdema After withdrawal of the P.A.S excretion of urinary protein slowly decreased became stabilised at 10–12 g daily In some 40 patients treated with P A S the urine occasio contained red cells, but it was not necessary to discon P A S treatment Hemming and Stewart think it that the glomeruli were affected in some way increased filtration of protein

Nagley and Logg (1949), analysing 37 cases with P A S, state that in their experience P.A remarkably free from toxic effects and can be without interruption for many months without untoward results Four of their cases developed hæmaturia and albuminuria, with a deposit of crystals in the urine They cleared on treatment alkalis and withdrawal of P A S for a few days, further effects when treatment was started again

The present case exhibits some unusual fea Pyrexia and a maculopapular rash followed by desquamation were outstanding Anuria (which I not seen mentioned previously) lasted thirteen It is impossible to say whether this was due to action or to blockage by swollen renal epithel Jaundice in such circumstances does not seem to been described before, nor has the presence of enlarged lymph glands in the neck, groins, and

aphasised previously There was no infective in the hospital or immediate neighbourhood at e The jaundice could have been obstructive, g a general thickening of skin and mucose in the reaction On the other hand, both the jaundice renal damage could have been a toxic side effect A S We have insufficient evidence to be certain atient was extremely ill and on the point of death ime Knowing what I now do, I would stop the erapy and substitute anti histamine drugs on the 1 of pyrexia in the absence of intrapulmonary or emonstrable cause, or on the first sign of a rash t of scarlet fever Desensitisation can be done er date, and I think it should be done because of easing use of drugs with a salicylic acid derivation ight possibly precipitate a return of the alarming ms at a later date

anks are due to Dr H. G Trayer, medical superinten guley Sanatorium, for permission to publish

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MEIGS'S SYNDROME

D BERESFORD
) Wales, M.R C P
EDICAL REGISTRAR

R AIDIN
M D Dubl, D C P
MORBID ANATOMIST

SOUTHMEAD HOSPITAL, BRISTOL

ong ago as 1879 Cullingworth recorded a case in fibroma of the ovary was associated with ascites ydrothorax, and another was described by Tait 2 But a definite clinical syndrome was not shed until 1937 when Meigs and Cass reported ases (four of their own and three others)

es and hydrothorax have also been observed with s other than fibroma of the ovary Thus MacFee reported a case of cystadenoma of the ovary which ed a similar clinical picture, and Schenck and Eis and Anderson (1944) reported cases in which ant tumours of the ovary were responsible Meigs (1943) suggested that when these cases formed a enough group they should be included in the me which bears his name

following case is an example of papillary adeno oma of the ovary producing ascites and hydro : in the absence of secondary deposits in the neum or pleura

arried woman, aged 77, was admitted to hospital on 4, 1948, with three or four months' history of gradually ing abdominal distension

xamination she was obese and had not apparently uch weight There was moderate œdema of both mbs, but the neck veins were not distended, and the could lie flat in bed with very little distress The id not appear enlarged, the heart sounds were normal, o murmurs were heard The blood pressure was 0 mm Hg There was a moderately large pleural n on the right side The abdomen was grossly distended parently contained free fluid No mass was palpable abdomen, the spleen and liver did not seem to be d.

ations —Paracentesis abdominis was done soon after ion, 5 litres of yellowish fluid being removed. The contained occasional cells that could not be identified ertainty Paracentesis was repeated four times, the ts obtained varied from 2 to 4 litres and no cells were the deposit. No mass or enlarged viscus was discovered paracentesis The chest was aspirated soon after ion, a straw-coloured fluid free from cells being awn.

tigations —The blood proteins were estimated on two ns on Dec 17, 1948, the serum albumin was 4 16 g, and the serum globulin 2 80 g, per 100 ml, and on Feb 3, 1949, the serum albumin was 3 21 g and the serum globulin 3 11 g A Wassermann reaction was negative, and the urine contained only a trace of protein

Progress —The patient s general condition being fairly satisfactory, she was discharged on Feb 12, 1949, and readmitted at intervals for paracentesis abdominis

Readmission —She was readmitted on April 10, 1949, much worse She was cyanosed and extremely dyspnœic, and had large bilateral pleural effusions in addition to her ascites In spite of aspirations of the fluid her condition deteriorated and she died two days after admission

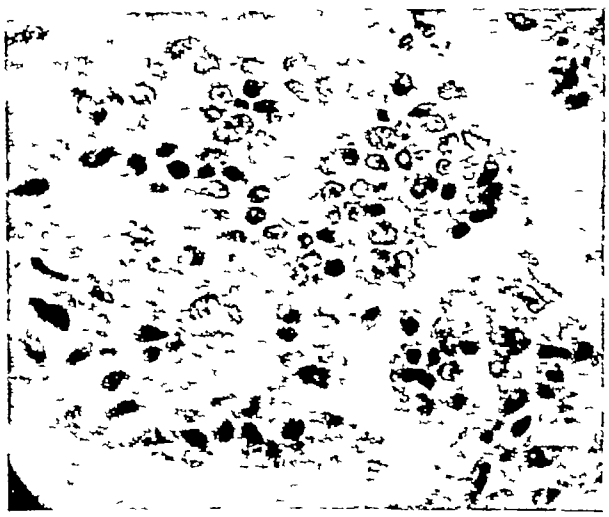
Necropsy twenty four hours after death showed that the peritoneal cavity contained 2–3 litres of serous fluid, and both pleural cavities a large quantity of amber fluid, the pericardial fluid was also in excess of normal The pericardium appeared normal The heart weighed 270 g and showed no abnormality Both lungs were greyish black and almost completely collapsed No secondary deposits were found in the lungs or pleurœ The liver weighed 1170 g and appeared normal The uterus was bulky and had a small submucous fibromyoma growing from the fundus The right ovary was normal, but the left was replaced by a cystic tumour measuring 60 × 40 × 40 mm It was covered by a smooth whitish membrane through which dilated venules were seen Attached to the main tumour was a smaller mass measuring 20 × 10 mm The pelvic colon was firmly adherent to the tumour, which was loculated and contained serous fluid and an irregular dark red friable growth Microscopy showed the growth to be a papillary adenocarcinoma degenerating in places Microscopy of the lung, pleura and peritoneum gave no evidence of secondary deposits

DISCUSSION

This case is reported as an example of Meigs's syndrome associated with a malignant neoplasm of the ovary Though it is generally known that the syndrome occurs with simple tumours of the ovary, its association with malignant tumours is less well known It is important to recognise the syndrome, because removal of the tumour is followed by disappearance of the effusions (Meigs and Cass 1937) As in the present case, because of their presenting symptoms these patients are often admitted to a medical ward with a diagnosis of congestive heart-failure or of cirrhosis of the liver, both of which can be associated with ascites and hydrothorax If the diagnosis is in doubt, peritoneoscopy should be performed, and, if necessary, exploratory laparotomy

The cause of the effusions is not known, and various theories have been brought forward to explain them

Selye's (1936) alarm reaction has been suggested as the mechanism responsible This hypothesis suggests that the effusions are the result of an irritant which produces a hypersensitive state (in this case a pelvic



Ovarian tumour showing adenocarcinoma. (× 400)

per c mm, and white cells 19,800 per c mm (polymorphs 24%, monocytes 10%, lymphocytes 61%, eosinophils 5%) The urine was acid and scalding on micturition Pot cit and sod bicarb were given regularly

Feb 27 and 28 the patient had diarrhœa, which was controlled by mist cret and kino

March 1 the patient s evening temperature was 102 4°F, and her rash was desquamating all over her body (loss on the palms and soles) The underlying maculopapular rash had gone There were still pains in the loins, but the general condition had improved The patient had been continent of urine for three days The urine contained albumin, no bile salts no sugar, no bile pigment, many pus cells, scanty red cells, and no casts, its reaction was neutral

March 2 the rash was profusely desquamating and the patient had low back pain but felt much better in spite of her pyrexia The white cell count was 21,400 per c mm (polymorphs 63%, lymphocytes 25%, monocytes 4%, eosinophils 8%)

March 5 none of the superficial lymph glands were now enlarged Desquamation was almost completed on head, trunk and limbs, but was starting on palms and soles

March 6 a blood count showed Hb 74%, red cells 3,780,000 per c mm, white cells 15,000 per c mm (polymorphs 71%, lymphocytes 20%, monocytes 4%, eosinophils 5%)

March 7 pyrexia was still present, and the blood urea level was 20 35 mg per 100 ml

March 9 the skin had almost finished peeling, and the maculopapular rash was returning Benadryl was discontinued, and 'Anthisan,' two 0 1 g tablets t d.s, was given There was no evening rise of temperature

March 13 there was no pyrexia, the patient felt drowsy but much improved, urine was being passed freely, and all œdema of face, arms, and legs had vanished The arms and abdomen were blotchy A patch test with sodium P A S and a control was negative The dosage of anthisan was reduced to two 0 1 g tablets daily

March 17 anthisan was discontinued 'Nivea' cream was given, with benefit to the generally dry skin

March 20 there were slightly erythematous and itchy areas on the forearms and anterior aspects of the elbows A patch test with sodium P A S on the front of the right thigh was now strongly positive after twelve hours' contact, the area covered by the patch being swollen and itching, with weeping of the skin. A control test without P A S was negative, and similar P A S tests on other patients not receiving P.A.S therapy were negative

March 25 the evidence of the positive patch test was still visible as a scaly area The urine was free from pus cells and red cells, and had only a trace of albumin. There were no loin pains or urinary symptoms Tests for sensitivity to penicillin and aspirin were negative

Desensitisation—On April 4 desensitisation was begun by the method used by Madigan et al (1950) After the first day slight itching erythema developed in the elbow flexures and round the site of the positive patch test, but this soon subsided, and the dosage of sodium P.A.S was continued The white cell count was 13,700 per c.mm (polymorphs 59%, lymphocytes 24%, monocytes 7%, eosinophils 10%) The urine now contained no albumin, red cells, or casts

DISCUSSION

Unfortunately we did not watch the blood P A S levels By the time the rash and jaundice had developed and we suspected an idiosyncrasy to P A S, the veins, poor at any time, could not be induced to yield sufficient blood for estimation However, idiosyncrasy to P A S can be acquired without a high blood P A S level (Hemming and Stewart 1949) It is noteworthy that during the thirty days of P A S therapy before the onset of pyrexia the patient had no upset of appetite, diarrhœa, nausea, vomiting, or any other toxic disturbance We have gained an impression from a study of blood P A S levels in other cases that vomiting and diarrhœa tend to keep those levels low, whereas they rise in the absence of vomiting and diarrhœa

At the outset of this illness penicillin was given for eight days The same penicillin caused no ill effects in any other patients in the hospital, and later the present case showed no evidence of penicillin sensitivity

Erdei and Snell (1948) saw no toxic [illegible] cases of pulmonary tuberculosis treated with [illegible] they think that such reactions described may [illegible] impurities remaining in commercial [illegible] not to the P A S itself

The sodium P A S used in the present case [illegible] stock solution and caused no upset apart from nausea, vomiting, and diarrhœa in any of other cases That a patch test done with [illegible] was so strongly positive in the present case and in control patients shows that this was a sensitivity Published reports of severe toxic to P A S therapy are scanty

Madigan et al (1950) studied 64 cases who had of sodium P A S daily with pot cit as required urine alkaline, 32 patients had nausea and 22 had diarrhœa, and vomiting Three cases of to P A S were reported two of them showed temperatures but no skin rash, the third generalised itching skin rash followed by [illegible] Patch tests in this case, unlike ours, were [illegible] aspirin but not for P A S The same workers, side effects of P A S, say that about half the [illegible] develop some intolerance to fatty foods

Kierland and Carr (1949) reported two cases fever and pruritic erythematous eruptions due to P [illegible] the reactions being so severe that the drug had to discontinued They had seen two other patients skin reactions but without fever

Horne (1949) describes a case with pyrexia, [illegible] face and conjunctivæ, intractable cough, and an [illegible] erythematous blotchy rash Small doses of P.A.S [illegible] elicited the same effects, but a patch test was [illegible] to P A S, and there was no eosinophilia. The case showed none of the intractable coughing [illegible] described by Horne or by Hemming and Stewart [illegible] in one of their cases Horne effected [illegible] successfully by increasing the doses of sodium P [illegible] from 0 1 g five times a day to 15 g daily

Hemming and Stewart (1949) report a case with [illegible] generalised skin irritation but no rash This patient extremely ill with fever, photophobia, nausea, [illegible] and restlessness It was thought to be a true case acquired idiosyncrasy Their second patient had [illegible] loidosis, but, under treatment with sodium P.A.S [illegible] daily, excreted, after four weeks, an increased amount urinary protein, with a few red cells and numerous hyaline and granular casts in the urine, and had occasional transient œdema After withdrawal of the P.A.S. excretion of urinary protein slowly decreased became stabilised at 10–12 g daily In some 40 [illegible] patients treated with P A S the urine occasionally contained red cells, but it was not necessary to discontinue P A S treatment Hemming and Stewart think it [illegible] that the glomeruli were affected in some way [illegible] increased filtration of protein

Nagley and Logg (1949), analysing 37 cases treated with P A S, state that in their experience P.A.S [illegible] remarkably free from toxic effects and can be [illegible] without interruption for many months without untoward results Four of their cases developed [illegible] hæmaturia and albuminuria, with a deposit of [illegible] crystals in the urine They cleared on treatment [illegible] alkalis and withdrawal of P A S for a few days, without further effects when treatment was started again.

The present case exhibits some unusual features Pyrexia and a maculopapular rash followed by [illegible] desquamation were outstanding Anuria (which [illegible] not seen mentioned previously) lasted thirteen [illegible] It is impossible to say whether this was due to [illegible] action or to blockage by swollen renal epithelium Jaundice in such circumstances does not seem to have been described before, nor has the presence of enlarged lymph glands in the neck, groins, and [illegible]

ing the case with which meningitis leptospirosa confused with other forms of lymphocytic is unless serological examinations are undertaken h in this country the meningitic syndrome to be more often attributable to *L canicola*, in ent case *L icterohæmorrhagiæ* was responsible rains of leptospira have been found pathogenic Continent It is not unknown for cases of is leptospirosa to be complicated by ocular nystagmus, optic neuritis, transverse myelitis, pheral neuritis (Scheid 1949) The possibility ision with syndromes caused by neurotropic vill therefore be appreciated

v be argued that the incidence of leptospirosis country is not great enough for serious con n, but, since the seasonal incidence is the same f poliomyelitis (July to November), and upwards of dogs in different towns are infected (Broom Intyre 1948), some cases of so called lymphocytic tis and poliomyelitis may possibly be leptospirosis

sh to thank Dr J C Broom, of the Wellcome ries of Tropical Medicine for his help in making ogical tests, and Dr E W Hart for permission to he case

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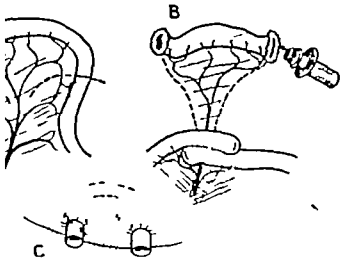
Preliminary Communication

IEF OF POSTOPERATIVE PAIN AND INTESTINAL MOTILITY

fact that morphine has a constipating action is own, and this important side effect has to be ed when the drug is used for the relief of post e pain It would therefore be useful to have gesic which would not interfere with normal al function, particularly after operations predis o distension or other undesirable gastrointestinal ations We present here the results of a quanti omparison of the effects of morphine, pethidine, idone ('Physeptone') upon the propulsive power ntestine in conscious dogs

operation has already been described (Streeten ughan Williams 1950) by means of which cannulæ rted into both ends of a "Thiry Vella" type of al loop A segment of gut, 4–6 inches in length, is resected, and the continuity of the intestine is restored by a side-to-side anastomosis (fig 1) The nerves and vascular supply of the resected loop are not interfered nd reach it via a pedicle of mesentery which is act Plastic cannulæ are then sewn into both the loop, and are brought out through separate ab incisions in the abdominal wall The end result g which leads a normal life, but from whose n protrude two cannulæ, one of which lies in en of the proximal, the other of the distal, end gment of intestine, which retains its normal ipply



A) Resection of loop
B) Anastomosis and annulation of loop.
C) Completed preparation

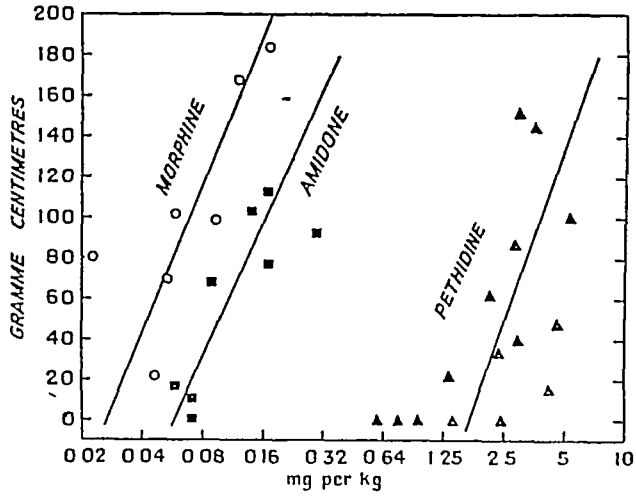


Fig 2—Ordinate total reduction of propulsive work caused by the drug Abscissa dose of drug, in mg per kg body weight on a logarithmic scale

Before experiments the dog lies quietly on its side, and watertight joints can be made between the cannulæ and recording apparatus Tyrode solution is then allowed to run at normal dog temperature into the upper end of the loop, which pumps it round and expels it from the lower end By means of three separate recorders tracings are made, on a smoked drum, of the contractions of the proximal end of the loop, of the contractions of the distal end, and of the rate at which fluid is expelled from the loop The movements of intestinal loops of this kind are usually recorded by means of balloons or boluses inserted into the lumen Neither can be said to be normal constituents of the bowel contents, and the present method, which employs Tyrode solution, represents an endeavour to imitate the physiological conditions normally existing in the small intestine, whose contents are, of course, fluid It is a development of a method recently described by Gregory (1950)

The pressure of the fluid entering the loop can be controlled, as can the height to which this fluid must be propelled before it can flow into the outflow recorder Thus the loop can be made to work under any conditions of pressure, and it has been our practice to keep the inflow pressure at a *lower* level than that of the outflow The amount of propulsive work done by the loop can thus be precisely estimated For example, if, in the course of five minutes, the loop raises 5 ml. of Tyrode, entering at a pressure of 6 cm water, to a height of 8 cm water, it has performed 10 g cm work—i e, is working at a rate of 2 g cm propulsive work per minute

Morphine, pethidine, and amidone all reduce the rate at which propulsive work is performed by these loops Two methods have been adopted for estimating their comparative potencies The first has been to determine the smallest dose of each drug which will just cause a significant reduction in the work done The second has been to plot, against the logarithm of the dose injected, the difference between the amount of work done after injection and that which would have been expected but for the action of the drug When a steady rate of work was established, the injection was made, and the total reduction of propulsive work before the original rate was re established was then calculated from the tracings In fig 2 the reduction of work is plotted against the logarithms of the doses of the three drugs

Morphine is the most powerful inhibitor of propulsive work, and the following figures give the relative potencies of the three analgesic drugs, as calculated by the two methods described above, in terms of the number

tumour), but it does not explain why only some pelvic tumours produce the syndrome

Pressure of the abdominal lymph channels by the pelvic tumour has been suggested by Schenck and Eis (1939) as the cause of the ascites The hydrothorax is explained by anaphylaxis and obstruction to the flow of lymph This hypothesis postulates a large tumour as the cause of the lymphatic obstruction, but not all the tumours are large, and, as in the case we report, some are quite small

Alteration in the blood protein levels is unlikely to cause the effusions, because a different clinical picture would be produced In the present case the blood-protein levels were normal on two occasions, and normal levels have been found by other observers

Dockerty and Masson (1944) observed that œdema of the tumour and/or the pedicle appeared to be related to the ascites, which was absent when there was no œdema They also pointed out that adhesions were present in 30% of cases with ascites, and suggest that the degeneration of the tumour produced the ascites Obstruction to the venous return by twisting of a pedicle may also be a factor in the production of ascites

The explanation of the hydrothorax is much more difficult Though Meigs et al (1943) demonstrated the passage of particulate matter through the diaphragm (probably through diaphragmatic lymph channels), they do not explain why all cases of ascites do not develop hydrothorax However, Marshall (1949) finds that all cases of ascites have some pleural effusion, and suggests that this can be adequately explained by passage through the diaphragmatic lymph channels He thinks that the size of the hydrothorax depends on the size and rate of formation of the ascites and the individual characteristics of the patient

Not all pathologists agree that some effusion accompanies all cases of ascites, and no attempt is made to explain why the hydrothorax is often unilateral Further, massive hydrothorax does not occur with ascites apart from this syndrome and some cases of cirrhosis of the liver, unless there is some obvious cause, such as heart-failure, nephritis, or carcinomatosis In these conditions there is very good reason for the hydrothorax, but further investigation is required to solve the problem in Meigs's syndrome

SUMMARY

A case of Meigs's syndrome associated with a papillary adenocarcinoma of the ovary is reported

The literature is briefly reviewed and various theories of the causation of the effusions are outlined

We wish to thank Dr P Phillips for permission to publish this case, and Mr G H Rogers for the photograph

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" If a new drug or combination of drugs, safe and highly effective in the treatment of tuberculosis, should be discovered in the year 1950, one might be tempted to assume that eradication would take place quickly and automatically In reality the responsibilities of those charged with tuberculosis control activities would be immediately increased There would be a moral obligation enforced by a vocal public opinion, to see that every case, in any stage of the disease, received the new therapy The immediate demand for hospital beds might be so tremendous as to constitute an emergency —Dr FLOYD M FELDMANN, *Amer Rev Tuberc* June, 1950, p 892

MENINGITIS LEPTOSPIROSA

T J GEFFEN
M D Lond, M R C.P
MEDICAL REGISTRAR

CECILY M TINKER
M D Lond, M.R.C.P
LATE HOUSE PHYSICIAN

HAMPSTEAD GENERAL HOSPITAL, LONDON

IN recording a further case of meningitis in the London area, our purpose is to draw to the ease with which this disease may be with the meningitic stage of poliomyelitis during epidemic

CASE RECORD

On Aug 14, 1949, a boy, aged 7, walked into the department of this hospital with a history of a day a few hours' intermittent abdominal pain, and He had vomited three times in the morning but had not put to bed

On examination he was quiet and flushed but could about without distress His temperature was 101°F pulse rate 110, and his respirations were 22 per min. There was no conjunctival suffusion, the fauces were some posterior cervical glands were palpable, but glands were not enlarged There was slight neck stiffness but the boy could kiss his knees easily, and there were other abnormal neurological signs The ears and fundi normal He was admitted to a side ward as a case of poliomyelitis in the preparalytic stage

Investigation —On the morning after admission puncture produced clear colourless cerebrospinal fluid under normal pressure containing less than 1 cell per with protein 20 mg, and chloride 618 mg, per 100 Sugar reduction was normal A blood-count showed leucocytosis of 10,000 cells per c mm. (polymorphs with a shift to the left)

Progress —For the next four days the patient had fever (maximum temperature 103 5°F) On Aug 17 severe fusion of the eyes was noticed and there was considerable more neck stiffness On Aug 18 there was a positive Kernig sign but no muscular weakness or tenderness and no change in the tendon reflexes The fundi were normal and there was no conjunctival discharge Lumbar puncture produced cloudy C S F containing 880 cells per ml (polymorphs 15%, lymphocytes 80%, mononuclears 5%), protein 55 mg per 100 ml with a slight excess of globulin, and normal amount of sugar and chloride No organisms were seen in the smear or on culture A blood-count showed 6000 white cells per c mm, with a normal differential count Blood-culture and urine examination showed no abnormality

Diagnosis —In view of the conjunctival suffusion and late development of a leucocytosis in the C S F, the possibility of leptospirosis was considered It had been noted that the boy spent weekends at a camp on a backwater of the Thames at Staines, and bathed frequently in the river, he admitted that there were numerous rats around the bathing area

Treatment and Progress —A course of intramuscular penicillin 250,000 units t d s was started on Aug 18, and from then on the patient remained afebrile, and clinical recovery was complete in three days He was discharged on Sept and was seen again a month later, when he was admitted with a dislocation of the right elbow, at that time he was otherwise completely well

Agglutination reactions against leptospira were tested at the Wellcome Laboratories of Tropical Medicine, with the following results

Aug 19 —Agglutinations negative at all dilutions against *Leptospira icterohæmorrhagiæ* and *L canicola*

Aug 24 —Agglutinations positive at 1/300 with *L icterohæmorrhagiæ* and at 1/10 with *L canicola*

Aug 30 —Agglutinations positive at 1/300 trace at 1/1000 with *L icterohæmorrhagiæ* and positive at 1/30 with *L canicola*

Agglutination tests made on the blood of the boy's mother and brother, who camped with him, were negative

DISCUSSION

Leptospirosis has been recognised, and outbreaks of the various forms have been described, for over a hundred years, the epidemiology and clinical features have been reviewed by Walch Sordrager (1939) In recent years several small series of cases have been published in this country (Robertson 1946, Buzzard and Wylie

THE LANCET

LONDON SATURDAY, AUGUST 5, 1950

Ætiology of Infantile Enteritis

the past decade more than 3000 infants under year have died annually from gastro enteritis in land and Wales, giving mortality rates of 4–5 per) live births It is true that there were ten times nany deaths from this disease fifty years ago, n the high seasonal wave gave it the name summer rhœa It is also true that the seasonal wave been flattened and the disease now occurs, in arently sporadic form, through summer and ter All the same, with an infant-mortality rate n to about 30, it seems hardly to the credit of public health measures that 4 or 5 of every 30 nt deaths are from an infection that is probably ventable Preventive measures, if not entirely endent on, are certainly helped by a knowledge the causative agent of a disease, and part of the ible with infantile enteritis is that its ætiology is l obscure It is, in fact, a syndrome of varied ology, ranging from mild dietetic upsets through eritis associated with parenteral infections to mary gastro enteritis of undoubted infectivity en in this last group, clinical and epidemiological dence suggests that there is more than one causative nt Besides the cases associated with accepted estinal pathogens of the salmonella and shigella nies, there have been outbreaks in maternity units ecting both infant and mother, and other outbreaks, ally mild, affecting breast fed and bottle fed ants impartially And there have been extremely ere outbreaks in which the brunt of the attack s fallen on the artificially fed or premature infant ch outbreaks have been more common in America an in this country and have encouraged the view at "epidemic diarrhœa of the newborn" is a ease sui generis, though in its clinical picture it osely resembles the diarrhœa and vomiting of older fants Inquiries into the ætiology of gastro enteritis ve largely been concentrated on institutional or mmunity outbreaks of this severe form in newborn older babies, and the recent investigations in itain implicating a specific serological type of *cterium coli* as a possible causative agent have been roborated in the U S A and in Scandinavia This *ct coli*, whose taxonomy may not be decided until atisfactory serological classification of the coliform ecies is adopted, masquerades under a variety of mes—*Bact neopolitanum*, α type, D 433, B G T, &c and it has already been joined by another claimant pathogenicity, called the β type[1] The present ation is analogous to that when the serology and thogenicity of the pneumococcus family began to unravelled Indeed, infantile enteritis has epi miological similarities with infantile pneumonia, in hch the infecting pneumococcus is often an endo ous strain like types 6, 19, and 23, but sometimes epidemic exogenous strain like types 1 and 14

1 Smith J *J Hyg Camb* 1949 47 221

Meanwhile, more data on the relation between *Bact coli* D 433 and diarrhœa are being collected The opening paper in this issue reports the details of two outbreaks of neonatal diarrhœa in a Liverpool maternity unit, one of great severity associated with *Bact coli* D 433 and mainly affecting artificially fed infants, the other a mild infection occurring equally in breast-fed and bottle fed babies The first outbreak was concentrated in the premature unit (separate from the main block), where within three weeks 10 of the 12 babies at risk developed diarrhœa and half of them died *Bact coli* D 433 was profusely present in the stools of the 10 ill babies and was not found in the 2 infants who escaped In addition, there were 7 cases among 28 babies who were nursed continuously in the nursery, and *Bact coli* D 433 was isolated from all 7 cases There were no cases in the main wards where infants were nursed beside their mothers but taken to the nursery for bathing and changing Of 12 infants discharged with positive swabs, 7 became ill within nine days, and all but 1 (who died at home) were again positive when re swabbed On the other hand, 62 out of 112 infants who were discharged with negative swabs were followed for at least a fortnight and all remained well, though 2 out of 25 who were re swabbed were carrying *Bact coli* D 433 of the other 50 infants, 4 who became ill gave positive findings on readmission to hospital When 55 healthy infants in the main block were swabbed five weeks after the last case of diarrhœa, there were no positive swabs but 9 out of 25 babies repeatedly examined in the premature unit gave positive swabs without developing any diarrhœa The occurrence of symptomless carriers during or after an outbreak calls for little comment, since similar findings are common in outbreaks of salmonella and shigella infections What is more unusual is the demonstration of the suspected pathogen in large numbers in the stools three days before the onset of symptoms This finding, together with incubation periods of nine days or more, seems to invalidate the view that *Bact coli* D 433 is the primary or only pathogen, to this should be added the general malaise preceding the diarrhœa or vomiting, and the absence of inflammatory changes in the bowel, which suggests a systemic infection However, there has been no evidence of a *Bact coli* septicæmia such as occurs in the somewhat analogous condition of calf scours Is it possible that in this epidemic enteritis there is a symbiotic virus and bacterial ætiology of the kind that causes swine influenza? The arguments for a virus ætiology have been reiterated by LIGHT and HODES,[2] who have produced enteritis in calves by introducing a filterable agent derived from newborn infants suffering from a mild diarrhœa that affected both breast fed and bottle fed babies

Experimental proof of the pathogenicity of the *Bact coli* strains is hard to come by, though Dr KIRBY and his colleagues in Liverpool had some success with experiments on adult volunteers The occurrence of *Bact coli* D 433 in the stools of adult patients with diarrhœa has been reported by STEVENSON[3], while, on the other side, PAYNE and COOK[4] found the same organism in the fæces of 17 out of 60 healthy institutional babies who were being

2 Light J S Hodes H L *J exp Med* 1949 90 113
3 Stevenson J S *Brit med J* July 22 1950 p 195
4 Payne A M, M Cook G T *Ibid* p 192

of molecules of active base required to produce the same effect as one molecule of morphine base

	Morphine	*Amidone*	*Pethidine*
Threshold dose	1	2 86	784
Dose required to reduce work done by 100 g cm	1	2 54	750

Translating these figures into their equivalent doses for a human subject of 70 kg, it appears that, whereas morphine (gr $^1/_4$, 15 mg) would abolish propulsion of fluid for an hour or more, the same dose of amidone would be only just sufficient to cause a detectable inhibition, and pethidine in doses as high as 200 mg would be well below the threshold for inhibition of propulsive activity

It is emphasised that the method described here measures the *propulsive* power of the intestine Morphine, as is well known, can give rise to a contracture of intestinal muscle The advantage of the present method is that it distinguishes between such contractures and effective propulsive contractions Indeed, it demonstrates that the contractures are not only ineffective for the propulsion of intestinal contents, but are actually inhibitory

The assay demonstrates also that if a sedative is required which does not inhibit intestinal propulsion, pethidine is much less inhibitory than morphine amidone Other work, both by ourselves and others, has shown considerable similarity reactions of human and canine gut, and these are presented in the hope that they may provide tional evidence on which a choice of sedatives (for of paralytic ileus, for example) may be based.

SUMMARY

1 A quantitative comparison has been made the effects of morphine, pethidine, and amidone the propulsive power of the intestine in conscious dog

2 It has been found that whereas morphine amidone, in doses equivalent to those used have a marked inhibitory effect, pethidine, even much larger doses, does not interfere with propulsion

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E M VAUGHAN WILLIAMS, B.M., B.Sc Oxfd
D H P STREETEN M.B Rand, M.R.C.P
Department of Pharmacology University of Oxford.

Reviews of Books

Cancer of the Breast

Clinical Study of 1042 Cases Treated at Radiumhemmet, 1936–41 BENGT A NOHRMAN Stockholm Esselte Aktiebolag 1949 Pp 98 Sw Crowns 15

THIS study contains much information of great interest to all concerned with the treatment of cancer of the breast The material consists of 1042 cases examined in the Radiumhemmet, Stockholm, from 1936 to 1941 inclusive, all of which were followed up for at least five years, 57 cases were treated at other hospitals and 118 were first seen with recurrence or metastases, while 45 were beyond treatment at the time of first examination A special analysis is made of cases referred from the Karolinska and Sabbatsbergs Hospitals because nearly every patient operated on for carcinoma of the breast was sent to the Radiumhemmet for radiotherapy This material is examined from many points of view, and all the usual factors are brought out—age incidence, marital state, pregnancy and lactation, heredity, and symptomology Classification is discussed in detail, the cases being grouped as operable and inoperable according to definite criteria (the most important being fixation of tumour and axillary metastases to the wall of the thorax) A statistical formula is used to allow for deaths from causes other than cancer of the breast, and after various factors, such as duration of symptoms, age, menopause, pregnancy, and lactation, in relation to prognosis, have been discussed, the results of different methods of treatment are compared The absolute survival-rate on the whole material was 40 1%, on the operable cases 49 5% These figures are further broken down to give detailed effects of preoperative and post-operative irradiation as carried out in a famous centre

Quinidine in Disorders of the Heart

HARRY GOLD, M.D, professor of clinical pharmacology, Cornell University Medical College New York Paul B Hoeber 1950 Pp 115 $2

QUINIDINE is a drug with a limited application, though highly effective in its proper sphere Its applications have not perhaps been studied as carefully as they might by all who employ it Professor Gold briefly explains how to avoid its misuse, and what are the appropriate conditions and effective dosage in which to give it He discusses the pharmacology, dosage, and toxic effects, and then the treatment of the main disorders of rhythm for which quinidine is helpful The book is simply written and practical, and should be consulted by anyone not fully experienced in the use of this drug

Helpful Hints to the Diabetic

W S COLLENS, B.S, M.D, chief of the diabetic Maimonides Hospital, New York, L C BOAS M.D, chief of the diabetic clinic, Greenpoint New York Springfield, Ill. Charles C Thomas Oxford Blackwell Scientific Publications 1949 Pp 21s 6d

THIS book, by the authors of *Modern Treatment Diabetes Mellitus*, is written for the patient to provide him with all the practical information he will need manage his diabetes successfully Various other books have had the same object, and their very different show how difficult it is to attain This latest work highly readable and has profuse illustrations, both colour and monochrome, which bring out well the of the technique of injection and urine-testing text contains one or two assertions which would be to substantiate For instance a single lump of is unlikely to overcome an early hypoglycæmic especially where this is due to protamine zinc and few patients indeed can attain the authors' in not allowing their blood sugar to exceed 120 mg 100 ml

For British readers the book has a number of limitations inherent in the differences in standardisation and practice which hold between this country and the U.S.A. Thus colour pictures of U S insulin preparations would only to muddle the British patient, and the omission calorie values in the description of diets would be disorder Then there are words such as podiatrist (chiropodist) number of specific foodstuffs which are outside our The rationale of dieting and the plea for standardisation syringes are well and opportunely expressed, but description of the Busher automatic injector, which the needle through the skin at an angle of 45° on release trigger, seems only to complicate a normally simple procedure Time schedules for various sorts of insulin injections and appropriate distribution of meals are expressed on a number of circular figures, but the first three refer to the single daily doses of unmodified insulin and have application to modern diabetic treatment There is a refreshing chapter on diabetic quackery, which, if less pertinent this country, certainly drives home the truth of the position held by parenteral insulin in the treatment of diabetes The book ends with a quiz and-answer section which the main practical points in the text

While the book is not well suited to British patients for whom it was not in fact designed, it does contain much sensible information It is a pity that the approach is so negativistic The diabetic is told in no terms what he must not do and why, but there is stress on the many things which he can still do should be encouraged to do

d the tone and motility of the colon (contrary e results of other observers), he therefore ded that morphine would favour the production toperative distension INGELFINGER[11] opposed se of morphine in this condition because it s the transport of gas or chyme This conflict icult to resolve, mainly because there are no ite records of the action of morphine in these ular circumstances It might be feasible to the technique that ALSTEAD and PATTERSON[12] in their assessment of intestinal carminatives e study of the effects of morphine and other esies on intestinal propulsion (as judged by the ge of flatus) after abdominal operations Finally is the possibility that intestinal distension may fected by the central nervous actions of these esies In dogs morphine causes an initial increase estinal propulsion through central vagal stimu i, but there is no good evidence for such an action in[4] However, where much pain and discomfort ociated with distension, the drug's central anal- and sedative actions may indirectly damp down ctivity of the overstimulated sympathetic centres since sympathetic stimulation diminishes the ulsive activity of the bowel, this depressant effect ie controlling centres may facilitate the passage atus This may perhaps explain why some rvers have claimed that morphine is beneficial in nts with intestinal distension

Annotations

IE NATIONAL COLLECTION OF BACTERIA

the beginning of this year the National Collection rpe Cultures transferred those of its bacteria which not primarily of medical or veterinary interest ie Department of Scientific and Industrial Research ie Agricultural Research Council This is in line the policy of decentralisation among specialist ratories which was adopted by the Medical Research ncil in 1944, when the collection, with its 5000 ures, had expanded beyond the capacity of its sing or its small staff[13] Since then the fungi and its have been divided between the London School Hygiene, the Commonwealth Mycological Institute at r, and the Institute of Brewing, and for two years bacteria have been included Any regrets that the imental may feel at the passing of the bacterial orium where research workers, university teachers, imercial bacteriologists, and the merely curious could nt on getting anything from *Acetobacter aceti* to *fius zenkeri* will be tempered with the thought that ntity has made way for quality In the new labora es at Colindale, where the collection has now been sed for a year, the cultures are being re examined their identities checked, and with the new drying- it it will be possible to supply teachers at home and oad with the usual organisms in the form of an elegant siccate" Despite their unattractive name these dried ures have many advantages over the familiar agar it, and the drying process should much reduce the nces of contamination and antigenic changes through eated laboratory manipulations

n the collection's new *List*,[14] organisms are grouped three orders, as follows

Order	*Family*	*Genus*
Actinomycetales	Actinomycetaceæ	Actinomyces
		Nocardia
	Streptomycetaceæ	Streptomyces
Eubacteriales	Mycobacteriaceæ	Mycobacterium
		Corynebacterium
		Erysipelothrix
		Fusiformis
	Bacillaceæ	Bacillus
		Clostridium
	Lactobacillaceæ	Lactobacillus
		Streptococcus
		Leuconostoc
	Coccaceæ	Staphylococcus
		Neisseria
	Enterobacteriaceæ	Bacterium
		Chromobacterium
		Kurthia
		Proteus
		Salmonella
		Shigella
	Pseudomonadaceæ	Pseudomonas
		Spirillum
		Vibrio
	Parvobacteriaceæ	Actinobacillus
		Brucella
		Hæmophilus
		Pasteurella
		Pfeifferella
Spirochetales		Leptospira

The nomenclature follows the 3rd edition of "Topley and Wilson" rather than the new Bergey's *Manual*, but those of us who are still following the classification of the first edition of the *List* may be surprised to find that the genus staphylococcus now includes all catalase positive gram positive cocci, many of which were previously listed under micrococcus or sarcina, *Staph pyogenes* (*aureus*) is said to be the only clearly defined species, all the others being divided for convenience into five groups, A–E In the genus pseudomonas only about a sixth of the species survive, but the table of salmonellas becomes increasingly like a page from a gazetteer

The new *List* is more than a catalogue of reliable goods with its background of patient continuing toil it will be an indispensable guide for medical workers of many kinds in many lands

SAFETY IN MINES

THE latest report on research on safety in mines[15] contains much information of interest to medical men, and especially to those whose work brings them into contact with mining communities The investigations described have a very wide range, including, for example, coal-dust explosions and the use of mining explosives, the detection of mines gases, safety of haulage and winding gear, the investigation of dust, and the testing of mining equipment

Dust Explosions—The use of stone dust to dilute the coal dust and so prevent explosions is at present indispensable Damping the dust is a further precaution It has been found that complete protection can be achieved only by the use of wetting agents (e g, 'Teepol') This reduces the inflammability of the stone dust, whereas water often binds stone dust and leaves the adjacent coal dust dry and unprotected

Mines Gases—The coalminer is constantly exposed to the risk of gassing, and the recent standards of ventilation control laid down in 1947 have emphasised the need for reliable methods of determining the presence and concentration of different gases Accurate methanometers are now available and can be used without further expenditure of man power, but attempts are still being made to find a suitable instrument for the estimation of small quantities of carbon monoxide It has been found that synthetic rubber bladders used for the pre analysis collection of mines gas are preferable to those made from natural rubber for the loss of gas by diffusion is less

The use of diesel engines for underground haulage has increased the risk of gassing from carbon monoxide and nitric acid (NO_2) which are present in the exhaust gases

Ingelfinger F J *New Engl J Med* 1943, 229 114
Alstead S, Patterson, J F *Lancet* 1948 i 437
Cowan, S T *Ibid* 1950 i 82
List of Species Maintained in the National Collection of Type Cultures Medical Research Council Memo no 21 2nd ed H M. Stationery Office 1950 Pp 16 9d

15 Ministry of Fuel and Power 27th Annual Report on Safety in Mines Research, 1948 H M. Stationery Office 1950 Pp 112 3s 6d

regularly examined, in 6 of them the *Bact coli* was present in large numbers for three weeks or more, and at one time as many as 10 out of 15 infants were excretors without there being any intestinal symptoms Thus, the picture is still confused More work is needed on the antigenic analysis of the coliform group and the possible pathogenicity of particular members, as was suggested by the studies of KAUFFMANN and VAHLNE If certain types are found to have epidemic propensities, more knowledge of their modes of spread should lead to better preventive measures Meanwhile, let us say again that this severe form of infantile enteritis rarely occurs in the breast-fed infant

Analgesics and the Bowel

THE most important pharmacological actions of morphine are, of course, those it exerts on the central nervous system In relieving pain, in depressing cough and respiration, and in sometimes causing vomiting, morphine acts on different regions of the brain But morphine also has distinct actions on some smooth muscles For example, it increases the tone and amplitude of contraction of the ureter, it raises intrabiliary pressure by causing spasm of the sphincter of Oddi, and it has complex effects on the alimentary tract Papaverine, another opium alkaloid, relaxes most smooth muscles, but preparations of opium such as the tincture do not contain enough to affect the action of the morphine The synthetic analgesics, pethidine and amidone ('Physeptone'), also have distinct central nervous and peripheral actions Both act centrally to relieve pain, but, among other peripheral effects, pethidine relaxes some smooth muscles, especially the ureter, though it raises intrabiliary pressure nearly as much as morphine [1]

The actions of morphine on the alimentary tract have been widely studied by a variety of techniques [2] Its constipating effect, seen in normal people and in patients with diarrhœa, is generally attributed to direct peripheral actions on the gut The following mechanisms may play a part in producing the constipation

(1) Spasm of the pyloric, ileocolic, and anal sphincters
(2) Increase in tone, and incoördination of movements, in the muscles of the alimentary tract
(3) Reduction in the volume of secretions into the intestine, leading to small, dry, hard stools which are difficult to evacuate
(4) Diminished sensation in the rectum (this would be a central nervous action)

Nearly all the investigations done, whether on isolated intestine, in unanæsthetised animals, or in human beings, have shown that morphine increases intestinal tone, though ABBOTT and PENDERGRASS,[3] using an intubation balloon technique in man, noted a depression of tone after initial stimulation Constipation is an index of reduced propulsive power in the intestine, but it may be associated with either increased or reduced muscle tone Incoördination of the activity of successive segments of the bowel will also inhibit propulsion of the intestinal contents and so tend to constipation ADLER and colleagues [4] made some instructive observations on ileostomy or colostomy patients, recording pressure changes with and assessing propulsive power by measuring volume of fluid discharged from the bowel They found that morphine caused a striking r or abolition, of propulsive motility, though there a simultaneous increase in tone and in non motility They summarised their findings by that morphine produces *dyskinesia* of the particularly of the colon, and such an action readily explain its constipating effect

In Prof J H BURN's department at Dr VAUGHAN WILLIAMS and Dr STREETEN have comparing the actions of morphine, pethidine, amidone on the propulsive activity of the bowel unanæsthetised dogs They describe on p 213 they prepare a "Thiry-Vella" loop of small which retains its normal nerve supply and blood through a pedicle of mesentery Both ends of the are cannulated and the propulsive power of muscle is estimated from its capacity to Tyrode solution from one end of the loop to the oth against a small pressure gradient This techniq provides a true measure of propulsive activity more physiological than the insertion of a balloon bolus into the loop The procedure does not rev the tone or non-propulsive motility of the muscle the loop, but perhaps these components will subjects for future study On the whole, their resu agree well with clinical experience in man, the a greater difference might have been expected betw amidone and morphine Of the three drugs, morp is clearly most liable to produce constipation, amido much less so, and pethidine hardly at all The meth should be useful for the study of new analgesic dru in relation to the bowel.

How far morphine is responsible for postoperative intestinal distension or paralytic ileus is still a ve question, and many conflicting views have b expressed, some based on experimental work, oth on clinical impressions The use of morphine intestinal distension was advocated by McIVER et al. who thought it would quieten intestinal movement OCHSNER and GAGE,[6] and YONKMAN et al,[7] w considered that the increased muscle tone was c value, particularly in preventing the developme of distension This view was also supported b CHESTERMAN and SHEEHAN,[8] who recorded the m dence of postoperative intestinal distension in patients after cæsarean section Paralytic il developed in 0 9% of the 340 patients who rece prophylactic morphine, compared with 5% of 160 who were not so treated Others have supp the opinion strongly expressed by Professor BURN his textbook [9]—that morphine favours the devel ment of intestinal distension and is certainly con indicated once distension has become establi KRUEGER [2] thought that the high pressure in intestinal lumen produced by morphine might lead perforation of a weakened bowel wall PU reported that in man morphine increased the to motility, and propulsive power of the ileum,

1 Gaensler E A, McGowan J M Henderson F F *Surgery* 1948 23 211
2 Reviewed by Krueger H *Physiol Rev* 1937 17 618
3 Abbott W O Pendergrass E P *Amer J Roentgenol* 1936 35 289
4 Adler, H F Atkinson A J Ivy A C *Arch intern Med* 1942 69 974
5 McIver M A Benedict E B Cline, J W *Arch Surg* 1 13 588
6 Ochsner A Gage I M *Amer J Surg* 1933 20, 378
7 Yonkman F F, Hiebert J M. Singh H *New Engl J* 1936 214, 507
8 Chesterman J T Sheehan W J *Brit med J* 1945, E
9 Burn J H The Background of Therapeutics London,
10 Puestow, C B *J Amer med Ass* 1942 120 903

ie inspections of persons not obviously ill was for purpose of finding faults typical of this is the ction for life assurance, the object of which is to a reason for rejection or loading and which is rse to the interests of the subject But the object odern school inspection is different it is to estimate ealth of the subject, to discover its trend and to out the good and the bad points so that the former be fostered and the latter suppressed or relieved. ce nobody now seriously questions the value of a mmary inspection though most hold that this ld be given before the age of school entry Opinion rs widely however on the scope of the examination (as Professor Moncrieff indicated) on whether, and what form, it should be repeated at intervals

PERSPECTIVES IN CRIME

t is natural for the well-conducted to dislike crime, especially some types of crime, and they may not it easy to see particular offences in relation to the ie record of the country as a whole Against the iptation to distort or exaggerate the Criminal tistics for England and Wales, 1949,[1] are a sound rective. The total number of people found guilty of ences of all kinds last year was 650 497—a formidable lv, on the face of it When the figures are broken wn, however it turns out that just over half of this st number of offenders had committed non indictable affic offences Another sixth had been guilty of such ings as drunkenness offences against by laws and hice regulations revenue offences (mainly failure to ense dogs or motor cars) betting and gaming, and fences against the Education Acts Only 3% had been ilty of breaking and entering only 0 8% of receiving, ily 0 5% of fraud, and only 0 5% of violence against ie person.

Of the total number of 650 497, only 114,294 (a fifth) id committed indictable offences, but it must be membered, too, that the actual number of indictable fences known to the police was 459,869—more than vice the number which ended in conviction Many ffenders remain undetected or—though suspected—annot be prosecuted (sometimes because they have ied) The annual total numbers of indictable offences nown to the police have in the main been rising since 938 (when the figure was 283,220), but 1949 shows fall of some 62 000 from the figure for 1948 Analysis f these various offences shows that larceny and breaking nd entering together account for more than three-uarters of the total and that both have been declining —larceny showing the lowest figure since 1945 and reaking and entering having fallen by more than 0,000 since 1946, the peak year Receiving frauds, id false pretences, however, rose considerably over the 948 figure, and so did sexual offences these together ere responsible for nearly a tenth of the whole There ere 5235 cases of violence against the person—less than ie-ninetieth of the total number of the indictable fences known to the police This figure represented increase of 52 over that for 1948, and of 2513 over the 938 figure, but the increase in this type of crime, ough not great, has been steady

When the numbers of those found guilty of indictable fences are analysed according to age groups and mpared with the 1948 figures, an encouraging fall in venile delinquency is found in both sexes and all e groups. Indeed, the figures for both boys and rls between the ages of 17 and 21 are not much higher an the figures for 1938 The most remarkable increase in the amount of receiving undertaken by children nder 14—an offence which has decreased in all the other e groups Violence against the person rose in all age-oups up to 1948 but in 1949 it fell considerably among children under 14 and slightly among those in the 17–21 age group This crime is in the main committed by those in the 21–30 and the over-30 age groups The report shows that the courts have made good use of probation borstal training and conditional discharge for those aged 17–21 Only 15% of them were given prison sentences in the higher courts in 1949 as compared with 20% in 1948 and 23% in 1947, in the magistrates' courts only 5% were given prison sentences as compared with 11% in 1948 and 13% in 1947

1 H.M. Stationery Office 1950 Cmd. 7993 Pp 92 3s.

CIVIL DEFENCE AGAINST THE ATOMIC BOMB

SOME months ago we reviewed[1] American estimates of the services needed to cope with casualties from an atomic bomb These were so elaborate and expensive as to seem impracticable their provision would be almost a whole time occupation for any nation The moral might be that the time has come for all the nations to face the facts of modern life and make a correspondingly determined effort to resolve their differences peacefully For the present, however rearmament rather than disarmament is the order of the day and the government of any thickly populated country which is a likely target for atomic bombs would be acting irresponsibly if it did not make plans whereby the damage would be reduced

In commenting on our leading article, Sir Ernest Rock Carling[2] said that no one who is conversant with the potentialities of modern weapons of war is likely to underestimate the task they would impose on the medical profession but "there is no doubt in the minds of those who have studied the whole question intensively, that hitherto published estimates of the casualties to be anticipated in our cities are far too high" Our buildings would give more protection than most of those in Japanese cities, and the new Civil Defence manual on atomic warfare[3] points out that even "the measures which proved effective in the last war, such as the warning system the provision of shelters schemes of dispersal and measures for preventing the spread of fire would undoubtedly reduce casualties and damage under conditions of atomic warfare" Soberly and clearly written for Civil Defence workers, the manual summarises the effects of atomic explosions under the headings of Heat, Blast and Radioactivity This last, being new in warfare and carrying persistent as well as immediate danger, is prominent in people's minds but should be kept in its proper proportion estimates of the causes of death based on experience in Japan are heat flash 20–30% gamma rays 15–20% and mechanical injuries and burns 50–60% Radiation sickness and its first aid treatment are only briefly outlined in this manual But there is much that can be done on the medical side to cure and mitigate the effects which are described These measures will be made known in the most appropriate way to all those who require this medical and technical knowledge"

REFERRED TO ARBITRATION

THE Ministry of Health has announced that proposals for revised salary scales for medical officers employed by local authorities are to be referred to the Industrial Court for arbitration Negotiations in the appropriate committee of the Medical Whitley Council have been unsuccessful

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Mr PETER DANIEL, consulting surgeon to Charing Cross Hospital, died at his home at Checkendon on July 28

WE also have to announce the death on July 28 of Mr E C HUGHES, consulting surgeon to Guy's Hospital

1 *Lancet* 1950 i 263
2 *Ibid* p 324
3 Atomic Warfare Home Office Civil Defence Manual of Basic Training vol. ii Pamphlet no 6 H.M Stationery Office 1950 Pp 50 2s

Their concentration should not exceed 0 20% and 0 10% respectively, and engines must not be used unless the ventilation in the haulage roadways suffices to keep the atmospheric concentration of carbon monoxide to not more than 0 01% A high standard of maintenance and supervision of personnel is necessary for the successful use of diesel locomotives These and other points are being embodied in regulations, at present in draft form

Haulage and Winding Gear—Failures under normal loads occur most often in gear made of wrought iron and may be traceable to poor materials and bad workmanship, such as bad welding Failures under abnormal loads are usually caused by the presence of low grade metal in the gear itself The report condemns the custom of using a wood fire for the heat treatment of mining gear and urges the establishment of a routine metallurgical testing service for the mining industry

Dust Investigations—"The quantitative study of industrial dusts involves two operations, the taking of a sample and its subsequent evaluation or analysis" Sampling in mines often has to be done in confined spaces with little or no illumination, thus making the use of large instruments difficult and accurate colour comparisons impossible A variety of instruments are at present in use for dust sampling, and these are described and compared from the points of view of accuracy, "pit worthiness,' and speed of estimation Some instruments can give on the spot results with reasonable accuracy Of all the instruments described, the thermal precipitator is the most accurate, but because of its size and weight it is not always convenient to use in a mine, and dust estimations by this method are time consuming The Konimeter is much easier to use and gives results accurate enough for all practical purposes

A useful appendix contains lists of lantern slides, posters, and films used in training centres

FILM FOR LAYMEN ON CANCER RESEARCH

THE argument in favour of telling people about the prevalence, causes, and diagnosis of curable diseases is that knowledge leads to a public demand for, and cooperation in, early recognition and efficient treatment On cancer much can be said that will relieve anxiety rather than create it, and the cinema vies with the radio as a means of gaining the attention of huge audiences The qualifications of a good cancer film for the layman are that it shall interest, enlighten, and reassure, and that it shall condition the prospective patient to recognise possible early symptoms of the disease and to seek reliable medical advice promptly when he notices them

A documentary film dealing with some aspects of scientific cancer research has lately been produced by the National Film Board of Canada cooperating with the Medical Film Institute of the Association of American Medical Colleges Entitled *Challenge Science against Cancer*, it is sponsored by the Canadian Department of National Health and Welfare jointly with the National Cancer Institute of the United States Public Health Service In half an hour it succeeds in giving the layman an inkling of the problems which cancer produces, and of some of the complexities involved in applying pathology, biochemistry, genetics, statistics, embryology, and radiology to those problems Those who see it must be convinced of the seriousness of cancer and of the activity of research organisations in pursuing knowledge of its cause and cure But, as a layman's introduction to the scientific side of the subject, it makes no attempt to impress upon the public the common early symptoms of cancer in the commoner sites nor does it emphasise the extent to which early recognition and treatment can ensure survival or abolish discomfort The characters in the film have little to say for themselves, and the dialogue, earnestly spoken by the Canadian film actor Raymond Massey, is consonant with the solemnity of the subject The pathetic expressions on the faces of the patients, and the brow-wrinklings of the laboratory workers are well calculated to wring the hearts (and purses) of a sensitive audience Animated designed to illustrate the detail of cell proc made at sufficient magnification to create the a complicated physicochemical molecular unive the musical accompaniment to these chemical equally unearthly

This film will not bring to their doctors more with adventitious lumps, abnormal vaginal persistent ulcers, coughs with hæmorrhage, or constipation, but it will show the public that the world is very far from idle about cancer; and it to the medical profession that films can be which make even some of the more abstruse cancer intelligible to the laity

Copies are available in 16 mm width from the Film Board of Canada, Sackville House, 40, Piccadilly (Tel Regent 5205)

SCHOOL MEDICAL INSPECTION

AT the Liverpool meeting of the B M A, Prof Moncrieff argued that routine medical examinatio school children is a waste of effort, and that the time could be used in other ways to the greater of the children[1] His remarks recall a paper which Dr I Gordon, now M O H for Ilford, consid the pros and cons of such examination

When the Education (Provisions) Act of 1907 ob education authorities to arrange for medical inspe in elementary schools, the immediate object wa discover diseases and defects for which the chil should have treatment, and to advise the pa accordingly This was the first example of me supervision of a whole unselected section of the c munity, and it aimed at prevention as well as rem but at the beginning of the century modern preve medicine hardly existed, and at first, therefore, the of medical inspection was almost wholly curative "static" examination was devised to distinguish diseased from the healthy, the former being advised obtain treatment, while the latter were passed forgotten We were yet to learn that this divisio arbitrary, that most of us are neither sick nor hea but maintain a precarious position between the states Static examination, unless very elaborate, reveal nothing but obvious lesions, the results of pathological processes, it gives prominence to struc departures from the usual, which may or may not consequence, but it fails to reveal the state of h and the way in which it is trending Important th it is as a beginning of supervision, it can be no n for health and disease do not stand still

At first, and to some extent still, school medical was looked on as the lowest grade of public health and a mere stepping stone to something better, but who undertook it saw that it could be perhaps the h expression of medical craft There are still though now mostly in retirement, some of th school medical inspectors, who have seen it change a mere scheduling of defects to an intelligent super of the child's health during the period of develop As the conception altered, they discovered how was known about the physiology of childhood an way in which people react to the stresses of environment, and the great increase of rel knowledge in the past thirty years owes much to disclosure of our ignorance

Dr Gordon, asking whether harm is done by r inspections, pointed out that "the injudicious may implant a neurosis by unnecessarily empha some harmless or mild condition" Before in inspection of school children was started, the

1 Dawson Williams lecture to the Section of Child Health reported on p 222
2 *Brit J soc Med* 1947 1 238

ITON saw danger in teaching induction for these

nosis of Early Pregnancy

F E STABLER, in an interesting and entertaining r, argued that when properly used clinical methods d prove just as accurate as the biological tests, iscussed several signs not generally sought, and the of percussion Other speakers also considered the ent's symptoms important, and the diagnostic ficance of a slight rise of temperature was mentioned

menopausal Bleeding

rof A M CLAYE defined this as bleeding in a non gnant woman after at least six months' amenorrhœa n the periods had previously been regular As a third ese patients had malignant disease, a full investigation always necessary Carcinoma of the cervix was the t important cause, but bleeding associated with a apse was common The first condition found on mination might not be the most serious one Much gnostic trouble was due to the use of œstrogens se should only be given with a good reason, and nobarbitone was often as effective Several speakers rred to the difficulties caused by the use of œstrogens

DISEASES OF THE CHEST AND TUBERCULOSIS

President Mr H MORRISTON DAVIES

section of Lung for Pulmonary Tuberculosis

Dr D F THOMAS based his remarks on an analysis 200 resections performed by Mr Ronald Edwards d his associates at the Liverpool centres Published sults, he said, differed widely, since some dealt with e treatment of minimal lesions and others with maximal" disease His series was very definitely in e former category In 30% of thoracoplasties cavity osure was not achieved, but so far 93% of their 0 patients had negative sputums after operation ie mortality had been only 2 5%, which is an traordinarily creditable figure

Their chief indications for resection were as follows iberculoma, bronchiectasis, empyema with fistula ndications with which few would disagree), and brocaseous disease and "failed thoracoplasty" He ade the important point that resection should not be ontemplated for bilateral disease unless the contra teral lesion was known to have been quiescent for at ast a year, and he finished by emphasising that the ries was experimental and no firm conclusions should drawn for at least five years, but that the short term sults were most encouraging

Mr RONALD EDWARDS said he was sure that if a non was not palpable it was safe to leave it Measures prevent over-expansion of the remaining lung tissue ould include phrenic crush or avulsion and pneumo ritoneum maintained for three months after lobectomy a modified thoracoplasty, leaving the first rib in situ er pneumonectomy

Mr JOHN BICKFORD analysed the series, of which had been followed for over a year, and 100 for six onths There had been 10 empyemata and 6 fistulas the first 100 cases, and only 6 7% had a persistently sitive sputum Of these patients, 55% would previously ve been considered suitable for thoracoplasty, and ere seemed little difference in the late results of those table and those unsuitable for this operation

Mr J R BELCHER said he felt that resection should confined to patients with some only of the indications lined by Dr Thomas, agreeing that it was ideal for wer lobe cavitation, and adding acute ruptures of a nty as another indication, but all other cases suitable surgery, particularly where disease was bilateral, uld be subjected to thoracoplasty Using this yard stick, Mr Holmes Sellors and his assistants were performing six times as many thoracoplasties as resections

Pain in the Chest

Dr DONALD LEEMING said that pride of place in the causation of this symptom was taken by cardiovascular disease In enumerating some of the many other causes, he emphasised the importance of liver abscess and amœbic hepatitis Dr RHODES ALLISON reaffirmed the importance of cardiovascular disease, and described its association with left shoulder pain and periarticulitis —a syndrome mentioned by several other speakers He also insisted that fibrositis of the chest wall was a clinical entity Dr J L LIVINGSTONE described, from personal experience, very widespread pain due to fractured ribs, and also mentioned spasm of the intercostals and of the triangularis sterni as a cause of pain in emphysematous patients

MEDICAL GENETICS

President Dr C P BLACKER

Contribution of Genetics to Medical Practice

The introduction of this new section was something of an event for the small band of medical geneticists It expressed their feeling that human genetics was approaching the stage where it would be able to offer the general practitioner practical help in dealing with the problems of the families under his care

The most obvious practical application of human genetics to medical practice is, of course, the analysis of the blood groups in relation to hæmolytic disease of the newborn Dr R R RACE told the meeting that once a Rh negative woman (or even baby girl) was immunised then all her subsequent Rh positive children would be affected, the proportion of Rh positive children depending on her husband's genotype Fortunately a pregnancy with a Rh positive fœtus was a relatively inefficient method of immunisation, and in only 10% of the marriages at risk were there affected children But a transfusion or even a small intramuscular injection of Rh positive blood would immunise about 50% of Rh negative women, this was maltreatment

Prof L S PENROSE, who introduced the discussion, drew attention to another field where genetic studies showed great promise This was the group of disorders to which Sir Archibald Garrod gave the title "inborn errors of metabolism" Here the relation between gene and clinical disorder was often as close and exact as with the blood groups Combined biochemical and genetic studies gave a precise meaning to the old concept of diathesis, and in time would give the practitioner the opportunity to institute early and effective prophylaxis

Dr J A FRASER ROBERTS showed that quite apart from the instances where genetics was important in diagnosis and treatment, it was of practical value in a wide range of diseases in giving advice to individual parents with an affected child who wanted to know if further children were likely to be affected in the same way For the past three years he had held a "clinic for genetic advice" at the Hospital for Sick Children, Great Ormond Street While the serologists, he said, knew the genetics of their subject backwards and needed no help from the geneticist, for some time to come neither the general practitioner nor the specialist would often have sufficient knowledge of the scattered and difficult literature to give parents the best genetic advice It was his experience that in the majority of instances it was possible to give the parent a reasonable estimate of the outlook for further children It was for the parents themselves to decide whether they would take the risks of having further children He thought that there would be scope for genetic clinics in every large city, if someone could be found to run them

BRITISH MEDICAL ASSOCIATION

Scientific Sections

OBSTETRICS AND GYNÆCOLOGY

President Mr ARTHUR GEMMELL

The meetings of this section took place in the engineering building of the university, and some speakers thought that this provided a very appropriate atmosphere for some of the subjects under discussion

Tuberculosis and Pregnancy

Mr J A STALLWORTHY emphasised the importance of unsuspected endometrial tuberculosis, which was found, he said, in 2–5% of curettings The classical symptom of amenorrhœa was uncommon in these cases, and more than half of them had some increase of menstruation Both bacteriological and histological tests were necessary for diagnosis and for proof of cure, and he referred to the work of a committee now investigating the effect of streptomycin treatment, which held that three negative tests at monthly intervals were essential before cure could be presumed Infection might spread in a symptomless case, and the only death in 48 patients who had been seen at Oxford occurred in one such patient who refused treatment Sanatorium treatment was unsatisfactory, and hitherto the only cures had resulted from radical surgery, but the use of streptomycin combined with *p* aminosalicylate had produced apparent cure in 5 cases out of 6, and this treatment could be carried out at home If, however, it did not bring improvement, radical surgery should be resorted to

In the discussion several cases were quoted in which apparent cure or improvement followed the use of streptomycin, and two speakers referred to the exacerbation sometimes seen in pelvic tuberculosis after diathermy

Dr R C COHEN, in a paper on Phthisis and Pregnancy, said that there was no evidence that pregnancy had any harmful effect on tuberculosis if good treatment was given Of 335 active cases in pregnancy which had been admitted, only 35 had retrogressed, and this was little more than the expected rate He felt it difficult to justify the use of therapeutic abortion, but admitted that social factors also had to be considered here Radiography should be carried out as a routine in pregnancy In the treatment of active disease in the pregnant woman, attention to secondary anæmia and to the mental condition was important Inhalation anæsthetics, including gas and air, could be given, a long second stage should be avoided, and cæsarean section should be resorted to for disproportion to a greater extent than otherwise and in cases of tuberculous laryngitis The use of artificial pneumoperitoneum after delivery had no physiological justification, but the use of an œstrogen was important Streptomycin could be given without any increased risk of reactions or harmful effect on the baby

In the discussion Miss PHILLIS DINGLE referred to the rapid deterioration that sometimes followed delivery, and said she was convinced of the value of an artificial pneumoperitoneum It was essential to use a large volume—as much as 3000 c cm —of a mixture of oxygen and air Other speakers laid stress on the favoured conditions under which Dr Cohen's patients were treated, on the importance of social circumstances, and on the difficulty of getting patients into a sanatorium

Prevention of Prolapse

Prof R A LENNIE said that, although in a series of 300 cases of prolapse an instrumental delivery had been carried out in 47%, he thought the most important factor in prolapse was an inherent weakness The timely use of forceps was justifiable as a prophylactic measure, especially in transverse arrest of the head Proper manual rotation was important, but rotation was to be condemned The use of the forceps might be dangerous, especially in the the novice The use of forceps on the aftercoming was also important The risk of an episiotomy a sudden descent of the head must not be overlooked

Mr J D FLEW believed that too much been laid on having an intact perineum after An episiotomy prevented ragged tears, obstetric manipulations, and decreased maternal fœtal damage by relieving the strain on the tissues was especially valuable in preventing damage to anterior vaginal wall, where many symptoms could

Mr BRYAN WILLIAMS, speaking on Delivery Repairs, said that though there was a risk of if delivery took place after a repair, he did not this sufficient to justify the postponement of treatment in young patients whose symptoms were troublesome The cervix, however, should not amputated, for this often led to serious complications pregnancy and labour, and the teaching of Fotherg himself on this matter had been much neglected. Apart from cases in which the cervix had been amputated, cæsarean section was seldom indicated But the patient who had had repairs must be delivered in hospital, often she would need either instrumental delivery episiotomy with a full repair

Mr R NEWTON described the pioneer work of Mr Heardman on antenatal exercises, and gave the results of a controlled investigation into the effects of exercises on the course of labour and the subsequent incidence of prolapse He reluctantly came to the conclusion that these exercises did not reduce the incidence of prolapse though they did result in a more normal labour

In the discussion on these papers attention was turned to the paradox of why prolapse seemed uncommon in the American woman, who so often underwent forceps delivery and episiotomy, and also in the Bantu woman, whose labour was so seldom aided in these ways Among those who discussed these points were Prof E C CRICHTON (Cape Town), Dr J Snyder (Philadelphia), and other who had worked in Africa Mr GORDON LENNOX maintained that no novice should treat occipitoposterior positions, and Mr C M MARSHALL stated that was far more important that a biparietal application of forceps should be made than that any particular instrument should be used Mr Flew thought that when exercises were done the obstetrician should supervise them himself, for otherwise they might be risky suggestion that the exercises should be demonstrated by Mr Newton and the Chairman (Mr Charles Read) strongly resisted

Postmaturity

Mr C J K HAMILTON and Mr WILFRED MILLS been regarded postmaturity as a definite entity carrying risk for the fœtus and often needing interference Mr Hamilton referred to Barcroft's work which showed that a certain crisis was reached in intra uterine life the fœtus must 'escape or die" Fœtal distress has been observed in a high proportion of the cases investigated by him, and he therefore favoured rupture of the membranes when there was a reasonable certainty that term had been reached, and felt that there was no place for the use of quinine or pituitary extract Mr Mills said that postmature babies might show excessive size or sometimes retarded growth, and asphyxia, favoured the extensive use of induction when term had been passed In the discussion there was a fair amount of disagreement with the openers' views, and Professor

œa and vomiting Infections encountered in the 1" wards amounted to 2% of all admissions, and h they were not usually fatal they represented a lerable reduction in the beds available With the ised use of intravenous therapy there had been a incidence of drip sepsis, amounting to 12 5% in 364 intravenous infusions given in 1949, but by adherence to surgical aseptic technique the incidence is type of infection could be considerably reduced e dangers of respiratory and intestinal infections ildren admitted to day nurseries were emphasised Dr K M HIRST, and one speaker described day eries as State sponsored centres of infections Dr RYLE gave an account of the commoner infections untered in schools, including influenza, streptococcal throat, otitis media, and glandular fever

ral Care of the Physically Handicapped Child

r C D S AGASSIZ said that handicapped children ld be treated as far as possible as normal children, e in hospital, they benefited from frequent visits, only from parents but from their brothers, sisters, friends They should receive education while in ital, attending a classroom in the grounds for this pose this would not only encourage mobility but ld give them a more normal mental outlook Dr issiz also favoured television sets in the hospital ward n admirable suggestion if funds can be found Dr H M. COHEN urged regional rather than parochial nning, and the psychological aspects were discussed Dr ALAN MABERLEY, who advocated rest, protection m environment, and encouragement for these patients, warned against making illness so attractive that vsical symptoms were exploited Dr MARY SHERIDAN ounted examples of the clinical histories of children fering from high tone deafness, and showed how this ect simulated mental deficiency

ANATOMY AND PHYSIOLOGY

President Prof A DURWARD

e Lymphatics

The meeting of this section opened with a film on e *Lymphatic System* by Prof J M YOFFEY The imary purpose of this film was to demonstrate functional mphatic pathways in different parts of the body A nsiderable part was devoted to the cervical lymphatic thway draining the mucous membrane of the nose d pharynx, this pathway was demonstrated in the t, dog, and monkey by the absorption of a vital dye er nasal instillation The film brought out clearly e presence of a chain of small lymph glands in the vical pathway of the monkey—similar to that in in—as opposed to a single large gland in the cat and g It also demonstrated the ease with which the ntonsillar and palatal lymphatics, as well as the entire vical pathway, could be filled after the injection of e intracranially into the subarachnoid space

sue Grafts

Prof. G M. WYBURN pointed out that homografts ided to give a higher proportion of failures than was ierally appreciated There were some interesting eptions—notably cornea and cartilage, which con ned a considerable amount of non antigenic polycharides One of the striking features about the n graft was that, while it retained some of its original iracteristics, it also acquired in some respects the iracteristics of the recipient area Professor Wyburn strated this by reference to sensation and sweating n from the abdominal wall grafted on to fingers or e tended ultimately to acquire the sensory pattern, any rate as far as touch was concerned, of the surround skin. He thought it probable that the ingrowing ves determined the resulting sensory pattern, perhaps even furnishing their own sense organs Furthermore, the nerves growing into the grafted skin were projected on to a much larger area of the sensory cortex The sweat glands remained anatomically unchanged, but the type of sweating might change radically, and abdominal skin, where sweating was primarily a thermal response, would after grafting on to the fingers develop an emotional type of sweating This, too, almost certainly depended on altered nervous connections, and not on any change in the sweat glands themselves

Histology and Physiology of the Adrenal Cortex

Dr M H POWER (U S A) reported on studies of patients with hyperfunction and hypofunction of the adrenal cortex He first distinguished between Cushing's disease, in which there was a basophil adenoma of the anterior pituitary, and Cushing's syndrome, in which there was hyperfunction of the adrenal cortex with or without an adrenocortical tumour Dr H L Mason had definitely established that with hyperfunctioning adrenal glands excretion of urinary corticosteroids was increased, and had recently isolated crystalline 17-hydroxycorticosterone (Kendall's Compound F) from the urine of a case of Cushing's syndrome Dr Power thought that this was the first instance of the isolation of an adrenal steroid from human urine, and on the basis of this and other evidence it seemed quite possible that Compound F might be the principal steroid elaborated when the adrenal gland was stimulated by adrenocorticotropic hormone (A C T H) Probably Compound F acted much like 'Cortisone,' though possibly larger amounts might be required to achieve some of the effects of the latter Cortisone or A C T H were capable of producing many of the signs and symptoms of Cushing's syndrome, including alkalosis

Dr Power described findings in patients with Addison's disease While cortisone was not altogether without influence on the course of electrolyte excretion, it was not as effective as deoxycortone acetate On the other hand, the ability of patients receiving cortisone to withstand the apparently severe electrolyte depletion and hæmoconcentration, with extremely low plasma sodium, emphasised the validity of the earlier work of Swingle and his associates, who had pointed out that the electrolyte changes per se might not be the primary factors in the fatal collapse of the adrenalectomised animal In a patient in whom deoxycortone had been replaced by cortisone, there was a condition of dehydration and hæmoconcentration which seemed to be typical of Addisonian crisis and should have been associated with vanishing blood pressure and collapse, but blood pressure had been well maintained, and the patient appeared far from collapse

Mr K C RICHARDSON discussed some structural aspects of the adrenal cortex Since the isolation of the steroid hormones, much effort had been expended on their detection in situ But unfortunately they were discharged from the cortex almost as rapidly as they were formed, and the histochemist was forced to attempt the identification of mere traces Mr Richardson emphasised the peculiarities of the adrenal circulation, as a result of which it was conceivable that adrenaline formed in the medulla might have ready access to the cortical cells, coming first into contact with those of the zona reticularis He doubted whether the zona glomerulosa could be regarded as an immature zone which gave rise to the fasciculata and reticularis, and he referred to the alternative view that there was a narrow, indifferent, intermediate zone, between glomerulosa on the one hand and fasciculata and reticularis on the other, capable of proliferating in either direction This was the sudanophobic zone However, while the glomerulosa and the fasciculata showed a relatively high frequency of mitotic division, mitoses were not entirely

Both Professor Penrose and Prof F A E Crew, F R S, touched on the wider question of eugenics Professor PENROSE put forward the view that at present the prospects of making any appreciable change in the genetical composition of the population were remote, and that such an aim, directed towards improving the health, not of the existing population, but of future generations, was hardly consistent with the fundamental medical tradition of treating every individual case on its own merits Professor CREW, on the other hand, held that the leaders of the medical profession should firmly declare that medicine was concerned not only with the health, happiness, and efficiency of individuals of the living generation but also with such as are yet unborn Medical genetics, he suggested, could become an instrument of precision that could be used with advantage in the preventive field

Dr W N PICKLES said that the general practitioner who had been long in one district saw clearly the trend of hereditary factors in disease, especially of common diseases He knew of one family of 62 persons, 23 of whom had had rheumatic fever or unmistakable signs of mitral disease

CHILD HEALTH

President Prof N B CAPON

When the B M A last met in Liverpool, in 1912, the title of this section was Diseases of Children including Orthopædics The change of name reflects the advances made in pædiatrics (and orthopædics) in the past 38 years

The chair of child health in Liverpool was established in 1944, and visitors were able to see the headquarters of the child health department at Alder Hey Children's Hospital where a clinical meeting was held, with demonstrations of tuberculosis and rheumatic infection In addition, there were five other meetings of the section —the largest number held by any section Throughout these meetings two important aspects of pædiatric practice were emphasised—the vital rôle of the general practitioner, and the necessity for continuity of observation and treatment if reduction of mortality and morbidity is to be achieved and full health maintained The coordination of services, so often lacking, is well advanced in Liverpool for 25 years a pædiatric physician has been on the staff of the Liverpool Maternity Hospital and this liaison has now been extended to all the neonatal units in the city Furthermore, there is active collaboration between the child health department and the doctors in the departments of infant welfare and school health

In his Dawson Williams lecture, Prof ALAN MONCRIEFF reviewed the changes in the pattern of disease in infancy and childhood during the past half century, and suggested that in consequence of these changes the work undertaken by the infant welfare clinics and by the school health service should be reorientated The infant welfare clinics might well concentrate on the prevention of tuberculosis, on the prevention and control of respiratory disorders, and on educative measures designed to prevent accidents on the roads and in the home He thought that routine school inspections by the medical officer were of little value and that a competent nurse would detect early variations from the normal If routine medical inspections were discontinued, the doctor could undertake the more important work of health education by helping to plan the school syllabus, by teaching biology and giving sex instruction, by supervising the hygiene arrangements, school meals, &c, and by investigating such problems as the causation of postural defects and how these responded to different forms of treatment

Breast feeding

Dr CHARLOTTE NAISH emphasised the continuity of treatment which the general practitioner could give during the antenatal, natal, and postnatal period deprecated the prevalent compartmentalism in branches of medicine and surgery She thought stress should be laid on three important aspects breast feeding—research, comparative animal and humanity (a word she preferred to pa The use of the right words might have a profound complementary feeding should be called top and breast feeding would be more popular if the tive fluid were called cow's juice rather than milk two clubs—one for mothers and the other for which thrive in Dr Naish's practice have a influence on both doctor and patient.

Dr K C RICHARDSON described the neurohumoral mechanism responsible for the discharge of milk the breast His paper, describing the action of the myoepithelial cells, was a notable contribution to literature of breast feeding, and the histological were of the highest order

Dr H K WALLER said that tension in the breast often caused diminished milk production and discussed the measures necessary in the last months of pregnancy to prevent the onset of tension His remarks illustrated by a coloured film In the general discussion "rooming in" and "self demand" feeding were mentioned by several speakers, and the general consensus of opinion was that all extremes should be avoided and that each baby presented an individual problem

Surgical Conditions in the Newly Born

Mr DENIS BROWNE said that pædiatrics was now firmly established as a specialty, and the care of children was no longer in the hands of the general physician The next logical step was to set up centres of neonatal surgery, with a surgeon in charge having special knowledge of neonatal disorders—a surgeon, in fact, care for a particular age period rather than for disorders of a particular organ of the body Special apparatus, special wards, specially trained nurses, and anæsthetists skilled in special anæsthetic techniques would complete the team

Mr R H FRANKLIN discussed some of the congenital abnormalities of the alimentary tract, particularly the œsophagotracheal fistulas, and described in detail the diagnostic procedures, the preoperative and postoperative measures, and the prognosis, which to a large degree depends on early diagnosis

Dr JACKSON REES spoke of the value of high anæsthesia using an endotracheal tube, which ensures good operating conditions for the surgeon, as little interference as possible with the vital processes of the child, and protection of the child against accidents such as collapse of a lung, which might occur during the operation

Epidemiology in Relation to Child Health

Prof STANLEY GRAHAM said that, of the four main causes of death in the neonatal period, infection was the one which the pædiatrician could influence the most The common minor infections encountered were conjunctivitis, pemphigus, and thrush, and the most infections usually met with were respiratory disease and epidemic diarrhœa Measures designed to prevent these infections and to prevent premature birth would noticeably reduce neonatal mortality

Dr W N PICKLES described the infections encountered in the home Tuberculosis was the most important infectious disease and he vividly described its ravages in a family in his practice He has records of 6000 cases of infectious illnesses occurring in his practice during the past nineteen years

Dr R M TODD described the infections occurring in Alder Hey Children's Hospital during 1949, and emphasised the dangers to infant life and health resulting from cross infection, particularly from an outbreak

INTERNATIONAL CANCER CONGRESS

ɛ fifth International Cancer Congress, which was in Paris at the Sorbonne from July 16 to 22, under presidency of Prof A LACASSAGNE, was opened by sieur VINCENT AURIOL, President of the French ublic Organised by the International Union Against er with the collaboration of the French League inst Cancer and UNESCO, it was attended by esentatives from more than 50 countries

s wide range is indicated by the following list of ions before which numerous individual papers were ented and discussed Tumours and Hormones, nours and Viruses, Experimental Chemotherapy, motherapy, Transplantable Tumours, General logy, Induced Tumours, Tumours and Micro ismns, Nutrition, Cytology and Histology, Bio-mistry, Radiobiology, Protection against Carcino ic Agents, Male Genito Urinary Cancer, Cancer of piratory Tract, Cancer of Alimentary Tract, icer of Salivary Glands, Cancer of Breast, Cancer Uterus, Cancer of Bone and of Blood, Cancer of rvous System and Cancer of Thyroid, General Patho y, Social Aspects of Cancer, and Miscellaneous mmunications Colloquia were also held each day which leading workers were invited to discuss their rsonal conception of the subject under review

Several films on technical and other (e g, popular ucation) aspects of cancer were shown during the ngress Other exhibits included cancer education and ncer control in different countries and an ambitious heme to index the names and interests of cancer search workers throughout the world, and to make icrofilms of their publications readily available

The reports of the congress will be published during the xt few months in issues of the *Acta Unionis Inter-ionalis Contra Cancrum* (obtainable at a cost of dollars from Professor Maisin, 61, Voer des Capucins, uvain, Belgium) The next (sixth) International ncer Congress will be held in Brazil in 1953

Communications

ÆTIOLOGY

Recent work by Gye, Craigie, Mann, and Begg had ggested that as mouse sarcoma could be transmitted frozen and desiccated tumour tissue this was evidence at a virus was the agent responsible for the tumour owth if it were assumed that the freezing and drying id killed all the original tumour cells R D PASSEY, DMOCHOWSKI, and I GLUCKSMANN (Leeds) reported at some cells could survive after freeze drying of ouse mammary tissue, and that this could be demon rated by microscopy and by the growth in vitro, by sue culture technique, of frozen and desiccated 'umour sue I HIEGER (London) also failed to confirm the ork of Gye et al and felt that their results could be plained upon such lines as "imperfect dehydration ives some cells or fragments of tumour with sufficient ability to grow in the new host" J E GREGORY asadena) had no doubts about the rôle of viruses, cancer, he claimed (see also *Exper Med Surg* 1948, 390) that electron microscopy of biologically filtered tracts of malignant and other tissues revealed objects similar cell structure only in malignant tissue and not normal or benign tumour tissue He also reported at an antibiotic produced by *Bacillus subtilis* had an hibitory effect on malignant tumour growth R D SSEY, L DMOCHOWSKI, W ASTBURY, R REED, and JOHNSON (Leeds) reported that electron microscopy extracts of any tissue (e g, mammary tumour, milk) own to contain the mouse milk factor revealed large mbers of particles which were absent or only present in insignificant numbers in similar extracts from mice of low breast cancer strain

I C DILLER (Philadelphia) found spores and other fungal structures in specially stained smears from almost every case she examined of a variety of mouse tumours (e g, leukæmias transplantable and induced sarcomas, spontaneous mammary carcinomas) and human tumours (mammary carcinomas, lymphadenomatous glands, sarcomas) A yeast or yeast like organism appeared to be the culprit, and injection of such freshly isolated organisms into mice caused death within 4–5 days N MORI (Naples) and F GERLACH (Santiago) also reported a relation between cancer and fungi

Tobacco smoking and cancer of the lung were discussed by E L WYNDER and E A GRAHAM (St Louis), A OCHSNER (Albany), and M LEVIN (Albany) All agreed that there was a significantly higher incidence of lung cancer in heavy smokers, particularly cigarette smokers Lung cancer was more common in men than in women, in women, however, the incidence was also far higher in cigarette smokers than in non smokers LEVIN also reported a positive relationship between lip cancer and pipe smoking WYNDER and GRAHAM stressed that a moderation of smoking habits, especially of cigarette-smoking, was desirable, the identification and elimination of possible carcinogens in tobacco was clearly important as well

A possible relation between circumcision and cancer of the prostate was suggested by A RAVICH (Brooklyn) who found a lower incidence of prostatic cancer in circumcised males, and recommended circumcision of all males during infancy as a safe and feasible means of reducing the incidence of prostatic and penile cancer as well as cancer of the cervix in females

CHEMOTHERAPY

Large scale "screening" trials of compounds for possible tumour inhibitory activity were reported by British and American workers C C STOCK and his associates at the Sloan Kettering Institute, New York, tested large numbers of compounds (e g, nitrogen mustards, ethyleneimines, folic acid analogues, steroids) against a "spectrum" of mouse and rat tumours Promising compounds discovered in this manner were those containing ethyleneimine groups and possessing biological activity similar to that of the nitrogen mustards The tumour inhibitory effect of substituted melamines was also detected by biological screening methods by J A HENDRY, F L ROSE, and A L WALPOLE (Manchester) E PATERSON and J BOLAND (Manchester) reported the results of clinical trials with trimethylolmelamine and an ethyleneimine derivative D A KARNOVSKY, J H BURCHENAL, J L BERNSTEIN, and C M SOUTHAM (New York) also reported the results of clinical trials with triethylene melamine These compounds, particularly the freely soluble triethylene melamine, may eventually replace the nitrogen mustards The therapeutic effects are similar, but there is far less nausea and vomiting, and the drug may be given orally KARNOVSKY and his associates emphasised that triethylene melamine was a very dangerous drug and was 2–3 times as active as the nitrogen mustard methyl bis(β chloroethyl) amine hydrochloride Particular care was needed in cases of lymphatic leukæmia

M B SHIMKIN (San Francisco) pointed out that as 20% of cases of myeloid leukæmia lived 4–5 years without any form of treatment care should be taken in assessing the activity of chemotherapeutic substances in this disease on a survival time basis

J M STICKNEY and W A BENNETT (Rochester) studied the effect of cortisone and adrenocorticotropic hormone (A C T H) on acute leukæmia, and reported that in most cases the patients did not respond to this therapy

lacking in the reticularis No final opinion, therefore, could yet be given on the relation between the main cortical zones from the point of view of cell growth The suggestion that the glomerulosa had as its function the secretion of steroids without oxygen at C^{11} was difficult to reconcile with the concept that it was an immature part of the cortex which provided cells for the actively secreting zona fasciculata He felt that all that could justifiably be asserted was that the outer cortex had a high growth potential, but the actual rate of growth in the intact gland, and what happened to individual cells, remained uncertain

Dr G W HARRIS discussed the neural regulation of ACTH secretion by the anterior pituitary gland. Three theories had been advanced to account for the control of ACTH secretion Long's adrenaline hypothesis suggested that circulating adrenaline played an important part in stimulating the output of ACTH, particularly after stress However, Dr Harris doubted whether adrenaline was of more than minor importance, for stress secretion of ACTH could occur in rabbits whose adrenal glands had been denervated, as also in dogs which had been completely sympathectomised, such animals also responded to electrical stimulation of the hypothalamus Then there was the view of Sayers and Sayers, that there was an inverse relation between the level of cortical steroids in the blood and the secretion of ACTH According to this hypothesis, the action of stress in stimulating ACTH output was indirect, stress first caused increased utilisation of steroid hormones by the tissues, after which the pituitary responded to their diminished level in the blood by further production of ACTH This theory was plausible as far as acute stress was concerned, but it broke down over prolonged stress, for after the initial response the steroid content of the blood would rise and automatically depress any further secretion of ACTH Dr Harris summarised experiments by himself and others which seemed to show quite clearly that secretion of ACTH could be evoked by stimulation of parts of the hypothalamus—namely the posterior region of the tuber cinereum and the mamillary bodies Furthermore, destruction of these regions abolished the response, which was measured indirectly by the fall in the blood lymphocytes A similar view had been advanced by other workers using the fall in the circulating eosinophils as a criterion Dr Harris felt that, under quiet conditions, the level of the blood steroids, and also the adrenaline content of the blood, played some part in regulating the output of ACTH, acting either directly on the pituitary or via the hypothalamus When stress supervened, however, neural influences exerted on the anterior pituitary via the hypothalamus would seem to take precedence over the other mechanisms

Dr M VOGT pointed out the difficulties of assessing cortical activity Hormones could not be estimated in the cortex itself, for it rapidly discharged its secretion into the blood Studies of the cortex itself could therefore only throw indirect light on the problem, through the estimation of chemical or histological changes known to be associated with cortical activity, such as the fall in its cholesterol or ascorbic acid content However, it was possible to attempt direct estimation of steroid hormones in the venous blood leaving the adrenal glands, through an elaborate method of biological assay Furthermore, prolonged stimulation of adrenal cortical secretion might result in frank hypertrophy Clinically, some guide to cortical activity could be obtained from the effects of the cortical hormones on the level of the blood eosinophils or uric acid, or capillary fragility Finally, the end-products of the steroid hormones could be assessed in the urine

Adrenal secretion could be stimulated in a variety of ways, which for convenience were included in the general term "stress" One of the responses to stress was increased secretion of ACTH by the pituitary, and organism thereby was provided with increased of cortical hormones Apart from its importance stress, ACTH maintained the adrenal cortex in a condition

The question then arose was the adrenal completely dependent on the formation of ACTH the pituitary? Here caution was needed for thing, there were some rather significant species ences Thus the pigeon responded to insulin even hypophysectomy Atrophy of the cortex was after 5 days in the rat, but after 1 month in the and not all layers of the cortex atrophied, for the glomerulosa after hypophysectomy remained normal or even hypertrophy somewhat

Could the adrenal cortex adapt its secretion to body's requirements by any other means than secretion of ACTH? The answer could be obtained from the isolated perfused adrenal, which secreted able amounts of hormone even if perfused with blood devoid of ACTH, and even if taken from a dog had been hypophysectomised some time previously Under such circumstances there was a basal steroid output, which had so far been markedly increased in two ways The first was by alteration in the electrolyte content of the blood, excess of potassium caused increased secretion The second was by perfusion with a source of readily available energy, such as adenosine triphosphate and related compounds

Professor YOFFEY then discussed the relation between the adrenal cortex and the lymphoid tissues It has long been known that there was some relationship between the adrenal cortex and the lymphoid tissue and lately the problem had been intensively studied by Dougherty and White Their main thesis was that a number of steroid hormones oxygenated at C^{11} produced varying degrees of damage to lymphocytes, resulting in regressive changes in the lymphoid tissues as a whole and lymphopenia As a result of lymphocyte dissolution and possibly also by a mechanism of secretion, increased quantities of gamma globulin and antibodies were discharged into the blood stream, and played an important part in the body's immunity reactions The increased formation of gamma globulin in response to cortical hormones and ACTH had not been confirmed by other workers, while as far as the regressive changes in lymphoid tissue were concerned, the evidence was by no means as clear cut as it at first sight appeared. The trend of recent work had been to implicate the plasma cell rather than the lymphocyte in antibody formation while no action of cortical hormones could be shown upon lymphocytes in vitro

He then referred to some recent experiments he had conducted in collaboration with W K Metcalf and W Nairn, with the statistical assistance of G Herdan, on a quantitative technique for the estimation of the nucleated cells of bone marrow, it was found that guineapig that 6 hours after intraperitoneal injection either an aqueous cortical extract or ACTH there was a statistically significant increase in the lymphocyte content of the bone marrow The lymphocyte-count increased from a normal of 142,000 per c mm of marrow to an average of 203,400 per c mm after ACTH, and 269,000 per c mm after cortical extract Furthermore the number of damaged cells actually diminished slightly as compared with those obtained in normal marrow It seemed probable, then, that one of the factors responsible for the lymphopenia induced by cortical hormones and ACTH was an increased uptake of lymphocytes by the bone marrow The significance of this was not clear, but since these substances produced changes in some of the other formed elements of the blood, it seemed possible that the increased uptake of lymphocytes by the marrow might in some way be related to these changes

understanding of structure could often only be d through also studying function

HONORARY DEGREES

he university convocation which followed, Lord n received the honorary degree of D C L, and the Orator, who presented him for the degree, drew ion to the felicitous results of the combination of ution in subjects of practical importance" with erience in the management of great affairs," as ohified in the career of the Lord Privy Seal In on, Prof G W Corner, of Baltimore, Prof M W deman, of Amsterdam, and Dr L S B Leakey, irobi, received the honorary degree of D SC The r gracefully disclaimed any detailed knowledge of ontents of Professor Corner's embryological papers, nanaged, as in his other orations, to find a singularly atin quotation to apply to the occasion Professor deman's work on experimental embryology was ed to as well as his distinguished war record, and ion was made of the practical skill of Dr Leakey as nthropologist and palæontologist

SCIENTIFIC CONTRIBUTIONS

the afternoon the congress settled down to the ntific business Since there were over 200 com- ications and 90 demonstrations, as well as a number lms, it is clearly impossible to mention individual ributions except by way of illustration In his ung address the President had spoken of the wide e of modern anatomy, and nothing could underline point more effectively than a study of the subjects the communications and demonstrations These ged from the mode of recovery of vision in trans ited salamander eyes (L S STONE) to the use of oactive phosphorus in the study of the growth of e and teeth (L F BELANDER and C P LEBLOND), from a radiographic study of the mechanism of lowing (F H KEMP) to the recovery of sensibility kin grafts (J R NAPIER and R E M BOWDEN) fact, to someone unacquainted with the way in ch the face of anatomy has changed in the present ury, and the rapidity with which it is still changing, ight seem startling that some of the communications ie under the heading of anatomy at all For example, re were papers on the effect of ultrasonic vibration the albumin molecules in blood (W BEJDL), on the le of spread of the virus of mouse encephalomyelitis K SANDERS) on the velocity of blood flow in the al glomeruli (J F HEGGIE) and on the changes in electroencephalogram produced by destruction of the ythalamus (W R INGRAM et al) These and many er papers showing a similar diversity of interests strate the variety of techniques which can be made serve the ends of modern anatomy, and the wide act of anatomy on other related subjects The verlap zone" where one subject meets another is n the most productive of new advances and the ic nature of anatomy ensures that it is involved in a at number of these overlap zones

The communications and the demonstrations were uped under several broad and often elastic headings, both, the greatest number of entries came under the ding of neurology The nervous system is to the tomist what the Amazon basin is to the geographer— of the great remaining unmapped areas—and it was ar from the work reported at the congress that the our of constructing maps was in very active progress a the histology section there were several papers on use of phase-contrast microscopy, and one whole ion was devoted to papers dealing with bone Among communications under the heading of general anatomy one advocating the extensive use of films in the hing of anatomy (H KUHN) An informal discussion on this topic led to the congress resolving to form an international committee to collect and collate informa tion on existing anatomical films from all the sources possessing such films, with a view to the production of a catalogue The resolution envisaged the possibility of forming an international lending library of anatomical teaching films

Embryology and morphogenesis included, as might be expected, many interesting papers, as did the section on endocrinology, in which several investigations on the structure and function of the pituitary were reported The section on physical anthropology produced a stimulating discussion on the relationships of the Australopithecine, thanks to the discoveries of Dr Broom, Dr Leakey, and others, Africa is now the continent in the forefront of anthropological interest

Finally a discussion was held on the vexed question of progress towards a uniform international anatomical terminology It was agreed that the President should invite the various national anatomical societies to appoint delegates to a committee to consider how best the great B N.A terminology might be modified to meet the present-day demands of workers in anatomy and in other fields It was also agreed that this committee should have a paid secretary, and it was suggested that an approach should be made to UNESCO for this purpose

SIDE SHOWS

Throughout the congress every opportunity was given to the assembled anatomists to have a very pleasant stay in Oxford, and there were many excursions and other entertainments available, including a dance at Oriel College In the Radcliffe Science Library a fascinating exhibition was on view, showing the history of the teaching of anatomy at Oxford, and among the programmes and literature handed to the visitors on their arrival was a booklet, prepared by Dr H M Sinclair and Dr A H T Robb Smith, which gave an authoritative and extremely interesting account of this subject

As is nearly always the case, the feature of the congress which was most appreciated by the delegates was the opportunity afforded of meeting each other informally and of exchanging "off the record" views and speculations This opportunity was the more valued on this occasion because of the previous infrequency of such meetings and the time which had elapsed since the last one

FINAL SESSION

At the concluding plenary session, held on the Friday afternoon, Professor LE GROS CLARK bade a formal farewell to the members In a short speech he made reference to the tragic death of Prof H C Bazett on his way to attend the congress Prof J BENOIT, for the French anatomists Prof N L HOERR of the United States, and Prof CAULLERY of the French Academie des Sciences all expressed, on behalf of the delegates, their appreciation of the organisation of the congress which had contributed to its success, Professor Caullery referred to the threat to science and to the world of the present international situation, and hoped that this threat would have been dissipated by the time of the next congress Professor Benoit proposed that this congress—the sixth—should be held in Algiers in 1955, and extended on behalf of the Association des Anatomistes de Langue Française a very warm invitation to the delegates of the present congress to attend it At the same time Professor Hoerr, on behalf of the American Association of Anatomists, issued what he termed a "standing invitation" to anatomists to hold a congress—perhaps the seventh—in the United States Both these invitations were enthusiastically received, and the congress broke up in the happy expectation of repeating a most interesting and stimulating experience in the not too distant future

S WEINTRAUB and his associates (New York) gave teroptern in 102 cases of metastatic malignancy and concluded that, although no objective signs of improvement occurred, the subjective improvement (relief of pain, sense of well being, and improved morale) noted in 55% of these cases indicated that teroptern was a valuable palliative for incurable cancer

G H TWOMBLY (New York) described the preparation and properties of C^{14} labelled *stilbœstrol*, although only animal experiments were performed, this substance may be of value in studies of œstrogen metabolism in malignant disease in man

DIAGNOSIS AND TREATMENT

G E MOORE (Minneapolis) discussed the localisation and diagnosis of brain tumours after intravenous injection of fluorescein dyes The dye concentrates in the tumour, and tumour tissue is easily identified by fluorescence in ultraviolet light Preoperative localisation of brain tumours was accomplished by injecting radioactive fluorescein dyes intravenously and surveying symmetrical areas of the head with a shielded Geiger Muller counter B SILVERSTONE, W H SWEET, and C V ROBINSON (Boston) used intravenous injection of P^{32} for localisation of brain tumours, a special Geiger Muller probe counter was used for detecting tumours below the surface of the cortex

S A GLADSTONE (New York) described the technique and value (e g, in ulcers of palate, gum, and cheek, carcinoma of cervix, carcinoma of rectum) of "sponge biopsy" A sponge of gelatin or cellulose was rubbed over the ulcer or mucous membrane, fixed in 10% formalin, and taken through to paraffin, the stained sections were then examined microscopically

A ALY (Cairo) reported good results in the treatment of 7 chromophobe pituitary adenomas after radium treatment by the intranasal route

T WIKLUND (Stockholm), and A OCHSNER (New Orleans) described their experience of bronchogenic carcinoma OCHSNER stressed the importance of palliative resections, not only to relieve symptoms of infection and obstruction but actually to prolong life

R W RAVEN (London) and G T PACK and T R MILLER (New York) described the importance of radical surgery in the treatment of malignant melanoma of the skin

H R BIERMAN and his colleagues (San Francisco) described a technique for catheterisation of the aorta, cœliac axis, superior mesenteric, and renal and demonstrated some remarkable arteriograms cannula was introduced through the brachial and was followed by fluoroscopy The technique primarily designed for the intra arterial injection nitrogen mustard into arteries directly

EXPERIMENTAL PATHOLOGY

H M EVANS and his colleagues (Berkeley) tumours (lung lymphosarcomas, adrenal phæochromocytomas, mammary fibroadenomas, ovarian tumours) in adult female rats after injections, over long periods, of large amounts pituitary growth hormone V KORENCHEVSKY found adenomas or adenoma like structures in thyroid, parathyroid, adrenals, pancreas, and liver adult rats treated with anterior pituitary sex hormones (e g, testosterone), thyroid or deoxycortone Every organ in the adult rat contain nests or foci of hyperplastic and metap cells, tumours could arise spontaneously by stimulation by hormones of the growth of such or, as in these experiments, by artificial horm stimulation

H L STEWART (Bethesda) reported the results intramural injection of methylcholanthrene into different sites in the glandular stomach of the rat The pyloric region was 3–4 times more sensitive to the development of tumours than the fundus

P R PEACOCK (Glasgow) reported that fowls bearing Rous sarcomas, and cauterised at sites remote from the tumour, localised the tumour in the cautery scar within 7–10 days Application of the cautery before the development of the tumour did not localise the infective agent No similar localisation was observed in birds bearing chemically induced tumours or grafts from such tumours

C HOCH LIGETI and D S RUSSELL (London) described the development of primary brain tumours in rats fed 2 acetylaminofluorene Tumour production was not prevented by a fresh milk supplement although the of the tumours and the longevity of the rats seemed be influenced

H A SISSONS (London) observed bone sarcomas in rabbits after intravenous injection of beryllium compounds of low solubility These tumours were remarkably like human osteogenic sarcomas and they metastasised to lymph nodes and to the lungs

INTERNATIONAL ANATOMICAL CONGRESS

INTERNATIONAL congresses in most medical subjects are now familiar events, and it is perhaps strange that an International Anatomical Congress should still be a comparative rarity Until this year there had been only four such congresses, none of them in this country The last of these took place in Milan in 1936, so a considerable time has elapsed since the previous international meeting of anatomists Last week, however, this gap was bridged when an International Anatomical Congress was held at Oxford from July 25 to 28, under the presidency of Prof W E LE GROS CLARK, F R S It is in keeping with the general trend of such meetings that there were more members than in any of the previous congresses over 550 attended, from 36 different countries The largest overseas delegation came from the United States, and of the European countries most members were provided by France, Italy, and Scandinavia The only Eastern European country to be represented was Yugoslavia, with three participants

Before the congress itself began, all the members were entertained at a Government reception held in Christ Church on the night of July 24 The guests were welcomed on behalf of the Government by Viscount ADDISON, K G, F R C S—himself at one time distinguished anatomist

PRESIDENTIAL ADDRESS

At the opening plenary session the next morning President, after welcoming the delegates, went on review the progress which had taken place in all of anatomy during the last decade, illustrating his by reference to the papers on the agenda for the congress He emphasised the steady breaking down of the artificial barrier between anatomy and physiology anatomists were now becoming more physiologically minded, and physiologists more anatomically which represented a return to the attitude of some of older anatomists, such as Harvey and Hunter Prof Le Gros Clark went on to emphasise the value of experimental approach in elucidating problems such those of neuroanatomy and, on the other hand, necessity for a continual extension of the field of graphical detail owing to the progressive encroachment of surgery on areas of the body which until recently denied to the surgeon He concluded that the primary business of the anatomist was with structure, but the

there are no figures to prove these mass examina n a national scale justify the energy and expenses ·d."

Exhibition

scientific exhibition was a model of its kind, re were assembled on the one hand sets of radio s exhibiting unusual features of medical interest, n the other the working tools of the hospital ist Once the radiological mode of treatment is d, then comes the planning by the physicist of the bution of the radiation and the means to be adopted easuring the dose delivered either to a particular of interest or what is termed the integral dose matters are now carried through with a fine e of exactitude, and it is an index of the individual ok of the physicists that so many have designed made their own dose meters This has been going r a good many years now, for the attractive historical on, where the hand of the museum expert was nt, contained the earliest model (about 1910) X ray quantimeter

In adding a final word about the Technical Exhibition which occupied the whole available space on the ground floor of the two halls of the Royal Horticultural Society, it is difficult to avoid the use of the superlative Certainly there has never been staged in this country an exhibit of radiological equipment so complete or satisfying The highest quality of design and workmanship was evident here, and there were exhibits from France, Italy, Germany, Holland, the U S A as well as a very considerable home quota The needs of diagnosis and treatment are being studied to the very last detail

* * *

The next international congress of this kind is to be held five years hence in Copenhagen It is on the records that the present one has entailed two years' work on the part of the president, Dr Ralston Paterson, and his colleagues It is no empty phrase to say that the radiological world will long be indebted to them all for the truly wonderful way in which the work of this congress was planned and carried out

Special Articles

DISTRIBUTION OF GENERAL PRACTITIONERS

HE Medical Practices Committee has completed its rey of England and Wales as at Jan 1, 1950 As in first survey, published a year ago,[1] all executive ncil areas or parts of them have been assigned to four edules, two of which (I and IV) we print below Any lication to practise in areas named in schedule I be granted "forthwith" Schedule II contains the nes of other areas where applications will be granted utomatically" The names of doubtful areas, where tors are not specifically needed, are given in edule III, and here each application must be carefully sidered "in the light of the position at the time" edule IV names the closed areas where the number of tors is considered to be adequate

Schedule I

COUNTIES

Cheshire.—Runcorn district (with the exception of Frodsham d Helsby) Crewe (Crewe and Nantwich district) Haslington rewe and Nantwich district)

Derbyshire.—Ilkeston B Alfreton Clay Cross Heanor Long ton, Ripley Swadlincote U D s Blackwell Chesterfield R D s

Durham—Hartlepool B Jarrow B Blaydon, Felling, bburn Ryton Whickham U D.s, Bishop Auckland Crook and llington, Shildon Spennymoor Tow Law Bolden Hetton ughton le Spring Seaham U D s Easington, Sunderland R.D.s

Essex—Barking Chelmsford, Dagenham, Romford B s lericay Canvey Island Hornchurch Rayleigh U D s

Gloucester County and City—Kingswood and Warmley

Hampshire—Eastleigh B

Kent and Canterbury—Bexley Chatham Dartford (and Dartford)) Erith Gravesend B.s Crayford U D

Lancashire.—Leigh Middleton B.s Abram Aspull Audenshaw ton Droylsden Golborne Haydock Hindley Newton le lows Standish with Langtree Tyldesley Westhoughton rsley (including Astley and Little Hulton) U D s, Haigh gan R D) Maghull (West Lancashire R D) Poulton with rnhead (Warrington R D) Southworth with Croft (Warrington)

Leicestershire and Rutland—Hinckley Melton Mowbray (except nerby)

Middlesex—Edmonton Tottenham, and Wood Green Heston and worth Southall B.s Hayes and Harlington Staines Yiewsley West Drayton U D.s

Northumberland—Wallsend B Ashington Bedlingtonshire).s

Nottingham County and City—Arnold Beeston Carlton and herfield, Carlton in Lindrick, Eastwood Edwinstowe and rton Kimberley Warsop

Staffordshire—Newcastle under Lyme Rowley Regis Tipton inesbury B.s Brierley Hill Brownhills Darlaston Sedgley inesfield Willenhall U D.s

Suffolk East—Beccles B Wainford R D

Warwickshire.—Bedworth U D Atherstone R D

Worcestershire—Halesowen District

Yorkshire (East Riding)—Haltemprice District

Yorkshire (West Riding)—Ossett B, Horbury U D Wakefield R.D Adwick le-Street and Bentley with Arksey Conisborough Dearnle and Mexborough Cudworth Darton and Royston, Dirfield Dodsworth Wombwell and Worsborough Tickhill U D s Doncaster R D

Denbighshire and Flintshire—Denbigh B

Glamorgan—Pontypridd U D

Monmouthshire and Newport—Cwmbran U D

COUNTY BOROUGHS

Dudley	Rotherham	Walsall
East Ham	Smethwick	Warrington
Gateshead	South Shields	West Bromwich
Great Yarmouth	Stoke-on Trent	West Hartlepool
Kingston upon Hull		

Schedule IV

COUNTIES

Bedfordshire—Harrold Riseley Sharnbrook Turvey (all in Bedford R D)

Berkshire—Brightwalton (Wantage R D) Lambourn (Hungerford R D)

Buckinghamshire—Brill Long Crendon Chalfont St Giles Chalfont St Peter Gerrards Cross Seer Green Great Missenden Prestwood Hambleden Horsley Green Stokenchurch Beaconsfield

Cheshire—Districts of Hoylake and West Kirby Knutsford and Wilmslow (with the exception of Lymm), Bollington (Macclesfield district) Carrington (Sale district) Helsby (Runcorn district) Hollingworth (Dukinfield Hyde and Stalybridge district) Mottram (Dukinfield Hyde and Stalybridge district)

Cornwall—Boscastle (Camelford district) Cawsand (St Germans district) Constantine (Kerrier district) Constantine Bay (Wadebridge district) Downderry (St Germans district), Fowey (St Austell district), Hayle (West Penwith district) The Lizard (Kerrier district) Marazion (West Penwith district) Mevagissey (St Austell district) Millbrook (St Germans district), Mullion (Kerrier district) Pensilva (Liskeard district) Perranworthal (Truro district) Polyphant (Launceston district) Rock (Wadebridge district), Ruanhighlanes (Truro district) St Agnes (Truro district) St Germans (St. Germans district) St. Keverne (Kerrier district) St Mawes (Truro district) St. Stephens (St Austell district) Tintagel (Camelford district), Townshend (Kerrier district), Tywardreath (St Austell district) Upton Cross (Liskeard district), Wadebridge (Wadebridge district) Widemouth Bay (Stratton district)

Cumberland—Alston Bootle Caldbeck, Dalston Gosforth and Ravenglass High Hesket Keswick Kirkoswald Millom Rowrah

Derbyshire—Buxton B, Whaley Bridge U D

Devon and Exeter—Ashburton Bampton Beer Bere Alston Bishopsteignton Black Torrington Bovey Tracey and Lustleigh Bow, Braunton Bradworthy Braunton (including Croyde Bay) Brixham Broadclyst, Buckfastleigh Budleigh Salterton Chagford Cheriton Fitzpaine Chillington Chudleigh, Chulmleigh Clayhidon Colyton and Seaton Combe Martin Culmstock, Dawlish Dunsford Exmouth Halberton Hartland Hatherleigh Hemyock, Hittisleigh and Cheriton Bishop Holsworthy Honiton Hope Cove Kings Kerswell and Ipplepen Lifton and Lewdown Lympstone Lynton and Lynmouth Modbury Morchard Bishop Moretonhampstead Newton Ferrers and Yealmpton North Tawton Ottery St. Mary Paignton, Pinhoe, Roborough, Salcombe, Sampford Peverell Seaton Shaldon, Shebbear and Beaworthy Sidmouth and Sidbury South Brent, Starcross, Tamerton Foliot Teignmouth, Tipton St John Torrington Totnes, Ufculme Umberleigh and Winkleigh Whimple Witheridge Woodbury Yelverton

Dorset—Abbotsbury Bourton and Gillingham Broadstone Buckland Newton and Cerne Abbas Child Okeford Corfe Castle, Cranborne Evershot, Ferndown and West Moors Handley and district, Maiden Newton, Marnhull and district, Milton Abbas and Winterborne Strickland, Puddletown Stalbridge Sturminster Newton Swanage Yetminster

1 *Lancet* 1949 ii 211

INTERNATIONAL CONGRESS OF RADIOLOGY

As described in our last issue, this congress opened in London on July 24 under the presidency of Dr RALSTON PATERSON There were 2700 delegates and the meetings included no fewer than 20 symposia with 108 contributors In addition, over 300 proffered papers were with few exceptions read by their authors

Symposia

The two subjects of radiodiagnosis and radiotherapy claimed the greater part of the programme, but there were large audiences for such symposia as Acceleration of Particles and Generation of Ionising Radiations Here the contributions gave the impression that technical ingenuity in the raising of electrical potentials is well ahead of therapeutic demand, whereas after hearing about the latest advances in Angiocardiography it seemed that exacting radiographic demands were not yet being fully met Supervoltage Radiotherapy claimed a session, and here a sober and cautionary note was struck, the technical difficulties fade into the background compared with the anxieties of the therapist as to what is going on beneath the skin of the patient Deep seated damage has now taken the place of the previous skin reactions to stay the hand in pushing the dose, the fact is that the reaction of the skin with supervoltage radiation can no longer serve as a reliable guide to the patient's reaction Modern skill has perfected rotational beam therapy either by rotation of the X ray beam or by rotation of the patient's table, so that with heavy doses at a depth the skin receives doses that it can well tolerate The day has come therefore when the skin reaction cannot be a guide to the therapist during the long process of delivering a lethal dose to a deep seated malignant growth Can he look in any other direction for this ?

A symposium on Radiation Histology included three references to prognosis in radiation treatment One was a direct negative to the question whether a prognosis of value can be given solely on the histological type of a malignant tumour Secondly, comment was made on the method of histological study by means of biopsies taken at intervals during treatment the degree of success so far attained by this method may be found in the Medical Research Council's report of *Researches on the Radiotherapy of Oral Cancer*, which we reviewed last week (p 179) From quite another point of view came a quantitative measure of the "degree and duration of effects" after irradiation

Two normal constituents of the blood, antichymotrypsin and antirennin have been studied In actively progressing cancer the former substance exceeds the latter quantitatively, and irradiation reverses this condition within a few days of treatment A five to ten fold increase in serum antirennin, with coincident fall in antichymotrypsin is characteristic of a favourable response It is obviously the work of some clinical laboratory to combine these two methods and see whether an unfailing guide to the therapist can result

ACTION OF IONISING RADIATIONS

Exactly how the ionising radiations act upon living tissues was discussed or touched upon in no less than three separate symposia, and here chemists, physicists, biologists, and geneticists joined issue The chemists made one suddenly aware of the gap between atomic and molecular studies, while the geneticists as a whole deplored the lack of certainty which lay at the very basis of their studies What in fact do we know of the normal mutation rates for the normal cells of the body ? There is little doubt that X rays and other ionising rays act by virtue of the ions set free in the tissues they enter, and that ionic concentration or ionic gradients determine the degree and nature of the [illegible] otherwise realised, but opinion may well range [illegible] cytoplasm to the single gene within the [illegible] in seeking the weakest link in the resistance of the [illegible] to its own destruction

PARTICULAR SITES

Three symposia were related to the treatment [illegible] specific sites of cancer—the larynx, breast, and [illegible] As illustrating the surgical point of view as to how [illegible] to treat cancer of the larynx, graphs were shown [illegible] ing 92 replies to a questionary on this point [illegible] group I (Broders) a large majority favoured [illegible] whereas for group IV opinion was evenly div[illegible] operative measures and irradiation In the [illegible] treatment of cancer of the breast it seems that [illegible] needling method, largely replaced in this country [illegible] external irradiation, is still used in at least one imp[illegible] Belgian centre In uterine cancer the best results [illegible] still obtained in cases of the cervix uteri, and it [illegible] great interest here to see how radiotherapists must [illegible] improving the already good results Perhaps it [illegible] be true to say that the radiation treatment of no var[illegible] of malignant disease has been the subject of [illegible] sustained and devoted study as that of the [illegible] uteri, and because of this the patient with this disease [illegible] recognised and treated in stage I, has the expectation [illegible] of a "five-year cure" loaded considerably in her favour

RECENT ACHIEVEMENTS AND THE FUTURE

In the symposium on Radioactive Isotopes both [illegible] diagnostic and therapeutic work was discussed. The [illegible] predominating interest was diagnostic, for the trace[illegible] elements are being rapidly put through their paces to [illegible] see which of them will best suit the varied needs of the [illegible] physiologist and the microscopist as well as the medical [illegible] radiologist But in therapy radioactive iodine [illegible] phosphorus are under test as therapeutic agents [illegible] world over, and not mainly in the field of cancer [illegible] in the symposium devoted to achievements since 19[illegible] the chief landmarks in diagnosis and therapy were [illegible] outlined and occasionally a deficiency noted, as [illegible] instance the lack of any reliable method of detecting [illegible] early carcinoma of the stomach

The growth of organised therapeutic methods suitable [illegible] for countries with such a population as ours proved [illegible] matter of great general interest

With nearly all radiological practice there is [illegible] degree of irradiation of personnel The impetus given [illegible] during the war to obviating radiation hazards connected [illegible] with the handling of relatively enormous quantities [illegible] radioactive material used in atomic energy [illegible] in the U S.A has somehow been carried along into [illegible] logical work everywhere There is in fact need for [illegible] closest attention to the dangers from the pen[illegible] radiations, and this need is likely to increase as [illegible] years go on The warnings of the geneticists [illegible] mutations induced by radiation are recessive in char[illegible] cannot be disregarded There is, however, no [illegible] to think of the nation as in danger on this accou[illegible] nor is it necessary to question the propriety of carr[illegible] out mass radiography of large numbers of people beca[illegible] of the possibility that these brief exposures could [illegible] them

Whether mass radiography will continue to be [illegible] on an increasing scale depends on other [illegible] its value, is self-evident, but its justification has to [illegible] determined on general economic grounds One spe[illegible] at the symposium on this subject went so far as to [illegible]

TREATMENT AND RESULTS

of tuberculous meningitis rarely responded tonly to intramuscular injections alone, and still arely when miliary tuberculosis was present ecal treatment gave appreciably poorer results applied on 50% or less of the intramuscular-ent days in a given period than when applied ntensively "The general trend of results within eneous clinical groups seems to be towards better s of survival with more intensive intrathecal s This assumes, however, concurrent intra lar treatment for at least two thirds of the days ven period ' But "there is no unequivocal evidence optimum level of intensity of intrathecal treatment 75% of the days in a given period."

cases of miliary tuberculosis without meningitis, s.F should be examined at the start of, and at als during, streptomycin treatment One third of ases of miliary tuberculosis so treated developed gitis during treatment, and about one fifth died ing it There was no evidence that "prophylactic" hecal treatment prevented meningitis in such

sessment of Results—As regards the C S F the tard which was adopted for "normality" was e—cells not more than 4 per c mm, protein not than 40 mg per 100 ml and sugar not less than ig per 100 ml During the period of observation was no instance of relapse in a patient whose had attained that standard, being at the same clinically fit and well

iboratory Findings—The report observes that in ing bacteriological proof of the diagnosis, a large s of "negatives" may precede a positive result r a period of 10 months, one patient had 61 negative rts before a positive was obtained

Parliament

Last Stages of the Medical Bill

HEN this Bill was considered on report in the House Commons on July 21, Mr ARTHUR BLENKINSOP, liamentary secretary to the Ministry of Health, red a new clause empowering the G M C, for those a suffering from disability, to substitute an equivalent iod in medicine for the prescribed period of practice surgery and midwifery The clause was added to Bill

n clause 14 Mr Blenkinsop moved an amendment nsure that, among the 9 members who would normally nvited to attend the medical disciplinary committee he G.M C, at least 2 would be elected members of council. The amendment was agreed to

n clause 15 Mr Blenkinsop moved an amendment ive statutory form to the present penal cases com-ee of the G.M.C and to secure that there should o overlapping of membership of this committee and medical disciplinary committee The amendment was ed to

r HUGH LUCAS-TOOTH recalled that in committee e had been some discussion on an amendment ed by Dr Hill in which it was suggested that a ernment department before making a complaint to G M C should institute some preliminary investiga- and that the complaint should be fortified by the n statement of an officer of the department Sir h then moved an amendment of more moderate acter, but on similar lines, which proposed that re a matter was referred to the council for considera- it should be set down in writing and that some onsible person should take responsibility for the ement on which the complaint was founded

r ANEURIN BEVAN said there was an agreement the G.M.C in 1932, after formal consultation with representatives of the Insurance Acts Committee of the B M A Under this agreement particulars of disciplinary cases investigated by executive councils (at that time the insurance committees) were set before the G M.C when they related to cases of irregular or lax certification, to cases of unprofessional conduct, to cases in which allegations of canvassing or fraud were established or substantially supported, since 1944 to cases involving professional negligence Copies of the following documents were sent to the G M C the report of the medical service committee or the local medical committee in certification cases of the executive council, the decision of the executive committee on the report, the report of the persons who heard any appeal against the decisions of the council, the representations, if any, made by the practitioner to the Minister on the question whether any money should be withheld from his remuneration, the letter of the department conveying the decision of the Minister, the report of the tribunal in cases where the tribunal decided to remove the practitioner from the list Mr Bevan said that all these documents were either signed or approved by persons or bodies It was not practicable for the department to endorse the facts therein stated which were not within their direct knowledge If the practitioner contested for instance, the facts in the report of the general medical service committee, his remedy was to appeal and the report on the appeal would set out his case The amendment was by leave withdrawn

On clause 17 which deals with amendments as to striking off the register, Mr Bevan moved an amendment to meet points raised on the Committee stage, which he described as so muffling the blade as to make it almost look like a benediction The retrial of cases by the G M C was avoided but while the facts were taken as facts, a form of language was used that did not load the name of the individual concerned with what Colonel Elliot had called "a penumbra of guilt or a nimbus of turpitude" The amendment was agreed to

On clause 33 Mr Bevan moved an amendment providing that no order prescribing the length of the intern period should have effect unless a draft had been approved by resolution of each House of Parliament The amendment was agreed to

The Bill was read the third time and passed with amendments

In the House of Lords on July 26 the Commons amendments to this Bill were agreed to, and on July 28 the Bill received the Royal Assent

QUESTION TIME

Shortage of R.A.M C Officers

Major NIALL MACPHERSON asked the Secretary of State for War what was the present deficiency of regular commissioned specialists in all branches of medicine and surgery, on the basis of existing establishment of the Royal Army Medical Corps, to what extent the deficiency was being made up by civilian specialists and what steps he was taking to overcome the shortage of regular specialists at an early date, and what was the present deficiency of permanent and short service regular qualified doctors in the R.A.M C on the basis of present establishment and what was the total deficiency after taking into account National Service doctors, and what steps he was taking to overcome the shortage—Mr JOHN STRACHEY replied The deficiency of regular including regular short service doctors is 381 This figure includes 13 specialists Taking into account National Service doctors the total deficiency is 265 which includes 115 specialists With a view to overcoming these shortages, an examination of the rates of pay of doctors and specialists is being carried out, 66 civilian medical practitioners and 10 civilian specialists have been employed and 49 medical officers including 12 specialists, have been given type "B" commissions for one or two years or have been granted special deferments Conditions for short-service commissions for women doctors will shortly be promulgated and proposals are now under discussion for reopening short-service commissions for specialists which are calculated to attract highly qualified doctors from civil life

Major MACPHERSON asked the Minister whether he would now bring the emoluments of qualified doctors and specialists

Durham —Gainford Middleton in Teesdale (Barnard Castle R D), Sedgefield Village and Stillington (Sedgefield R D)

Essex —Brightlingsea, Frinton and Walton West Mersea U D s Great Bentley St Osyth Thorpe le-Soken (Tendring R D)

Gloucester County and City —Blockley Chipping Campden Mickelton and Moreton in Marsh, Frampton on Severn Lechlade and Fairford Minchinhampton, Brimscombe and Nailsworth, Pilning Ruardean, St Briavels Tetbury

Hampshire —Lymington B

Herefordshire —Eardisley Kington and District, Leintwardine, Pembridge Weobley, Whitchurch

Hertfordshire —Elstree (including Boreham Wood) R D , Garston district (Watford B)

Huntingdonshire —Alconbury Weston Buckden

Isle of Ely —Manea

Isle of Wight —Bembridge Freshwater, Totland and Yarmouth, Niton Seaview Shorwell

Isles of Scilly —Isles of Scilly

Kent and Canterbury —Lydd, Sandwich Tenterden (with the Cranbrook and Tenterden R D s) Tunbridge Wells B.s , Broadstairs and St Peters, Herne Bay Sevenoaks U D s Ashford (East) Ashford (West) Dover Romney Marsh and New Romney B , Sevenoaks R D s St Paul s Cray, St Mary s Cray

Lancashire —Lytham St Annes B , Carnforth Grange over Sands Preesall U D s Bleasdale (Garstand R D) Broughton West (Ulverston R D) Coniston (Ulverston R.D) Freckleton (Fylde R D) Hawkshead (Ulverston R.D) Kirkby Ireleth (Ulverston R D) Lower Allithwaite (Ulverston R D) Lowick (Ulverston R D), Pilling (Garstang R D) Stalmine with Staynall (Garstang R D)

Leicestershire and Rutland —Hallaton Market Overton Peatling Magna Somerby, Uppingham

Lincolnshire (Holland) —Gedney Hill (East Elloe R D)

Lincolnshire (Kesteven) —Bassingham Billinghay Castle Bytham Colsterworth Corby Dunston Folkingham Heighington, Horbling Long Bennington Martin, Metheringham Rippingale Ropsley Ruskington Woolsthorpe

Lincolnshire (Lindsey) —Mablethorpe and Sutton-on Sea Market Rasen Woodhall Spa U D s Bardney (Welton R D) Burgh le Marsh (Spilsby R D), Dunholme (Welton R D) Hogsthorpe (Spilsby R D) Immingham (Grimsby R D) Keelby (Caistor R D), Newton on Trent (Gainsborough R D) Revesby (Horncastle R D), Tetford (Horncastle R.D), Thorseby North (Louth R D), Wainfleet (Spilsby R D)

Middlesex.—Finchley B

Norfolk —Thetford B Diss Hunstanton (New) Wells-on Sea U D s , Freebridge Lynn R D

Northamptonshire.—Blisworth and Roade Brixworth Bugbrooke and Kislingbury Byfield and Woodford Halse Cold Ashby, Crick and West Haddon, Earls Barton, Flore Guilsborough Islip Long Buckby Moulton Raunds Weedon Welford, Yardley Hastings

Northumberland —Rothbury R D

Nottingham County and City —Carlton-on Trent, Colston Bassett, North Collingham North Leverton Tuxford

Oxford County and City —Bampton and district, Burford and district, Chinnor Little Milton and Thame Shipton under Wychwood

Salop —Clun

Somerset —Castle Cary Churchinford Curry Revil Dulverton Dunster Keinton Mandeville, Ilchester Ilminster Langport Long Sutton Milborne Port, Minehead Nailsea Porlock Queen Camel Somerton, Stogumber Wedmore, Williton Yatton

Staffordshire —Uttoxeter R D

Suffolk East —Aldeburgh Southwold B s Saxmundham U D Earl Soham, Peasen Hall, Yoxford (Blyth R D) Orford (Debon R D), Stradbroke Pressingfield (Hartismere R D) Wangford Wrentham (Lothingland R D)

Suffolk West —Melford R D

Surrey —Banstead, Haslemere Leatherhead U D s

Sussex East —Bexhill B Cuckfield (including Haywards Heath with the exception of the Crawley Development Area) U and R D s, Rye U D Battle R D

Sussex West —Angmering Rustington and East Preston, Barnham, Eastergate and Yapton Loxwood Rudgwick and Slinfold Selsey Storrington, Worthing

Warwickshire —Southam (except Southam) Stratford on Avon R D.s Hampton in Arden (Meriden R.D)

Westmorland —Ambleside, Arnside Brough, Glenridding Grasmere Kirkby Lonsdale Kirkby Stephen Milnthorpe Orton Shap Staveley Temple Sowerby

Wiltshire —Aldbourne Bradford-on Avon, Broadchalke Burbage, Codford St Mary Fovant Great Bedwyn Hindon Lacock Market Lavington and Littleton Panell Mere Pewsey Sherston Shrewton Sutton Benger Tisbury Whiteparish

Worcestershire.—Hundred House Malvern districts

Yorkshire (East Riding) —Hornsea U D , Bubwith Elvington Escrick Holme-on-Spalding Moor Leven Middleton-on the Wolds Rillington Roos, Stamford Bridge

Yorkshire (North Riding) —Aysgarth, Bedale Easingwold Helmsley Kirby Moorside Leyburn Masham Reeth Thirsk, Wath R.D s Aldbrough St John and Newsham Danby and Grosmont, Great Ayton Hutton Rudby and Stokesley Hovingham and Welburn

Yorkshire (West Riding) —Kirkby Malzeard (Ripon and Pateley Bridge R D)

Anglesey —Beaumaris B , Llangefni Menai Bridge U D s Aethwy (with the exception of Brynsiencyn) Valley (with the exception of Holyhead Island and Rhosneigr) R D.s , Llanerchymedd

Cardiganshire —Aberayron Borth Cardigan Crosswood Henllan Lampeter Llandyssul New Quay Pontrhydgroes

Carmarthenshire —Caio Conwil Elvet with Abernant church, Drefach and Tumble Ferryside Llandovery Llanybyther Nantgaredig Pontyates, Trimsaran, area ately adjacent to Henllan and Lampeter in the executive council s area

Caernarvonshire —Bettwys y Coed Criccieth Portmadoc U D s , Llcyn, Nant Conway R D.s (Gwyrfai R D)

Denbighshire and Flintshire —Cerrigydruidion Hanmer (Overton R D), Llanfairtalhaiarn Llanrhaiadr ym Mochant

Glamorgan —Cowbridge (with the exception of B and R D Cardiff (with the exception of Whitchurch Rhiwbina) R D Llanmorlais, Penclawdd (Glamorgan R.D)

Merionethshire —Aberdovey, Bala, Barmouth, Corris Harlech, Towyn

Monmouthshire and Newport —Caerleon U D Raglan mouth R D) Tintern (Chepstow R D)

Pembrokeshire —Boncath Maenclochog Newport Solva Treowen

Radnorshire —Whole of county

COUNTY BOROUGH

Bournemouth

B borough U D urban district R.D rural district.

STREPTOMYCIN IN TUBERCULOUS MENINGITIS

MINISTRY REPORT

THE Ministry of Health organised through the medi schools in England and Wales, and with the cooperat of certain hospitals in Northern Ireland, an investigati into the efficacy of streptomycin treatment of tuberculo meningitis The Ministry has now issued an analysis the results

The report covers 369 bacteriologically proven cases tuberculous meningitis, with or without generalis miliary tuberculosis, which were observed for 10-2 months The mortality for the whole series was 71·4 and for early cases 50 7% Of those who survive 31% had normal cerebrospinal fluid (c.s F) and approx mately 89% were clinically fit and well "There appears to be a belief prevalent amongst many medic practitioners that streptomycin treatment does no more than prolong life or produce 'recovery' as a physical and mental wreck This is not true" Of pa treated early in the disease, some 40% "made a complet recovery except in some instances for minor disabilitie which at the time of assessment did not interfere wi their leading a normal life"

The 104 survivors were followed up at the end of further year, giving observation periods varying 22 to 33 months All were still alive, 88 were clinic fit and well, and 59 (57%) had normal c.s.F Of th 16 not fit and well, 6 were under 4 years of age a were described as "mentally retarded", 2 were suffer from genito urinary tuberculosis, and 8 who had be "unfit" at the assessment a year earlier compri 3 with bone or joint tuberculosis, 1 with optic atrop 2 paralysed and incontinent, and 2 "emotiona unstable," one of these being also deaf At the e 22 months the over all survival percentage was fo meningitis alone, and 17 for meningitis complicat by generalised miliary tuberculosis Among those obser for longer periods there was no fall in these percenta For "early" cases there were 48% of survivors at months and at 2½ years, but for "advanced" ca only 12% at 13 months and only 10% at 2½ ye —differences which underline the importance of pro treatment

"With the general release of streptomycin to all pr tioners and hospitals there has been a considerable de in the number of patients admitted for treatment to selected hospitals participating in this investigation order that research may be carried out on the rela ments of different modes of employment of strep in patients clinically comparable, adequate numbers needed It is most necessary therefore to give selected hospitals the opportunity for admitting patients if they have accommodation available"

Northern (42), Wales and North Western (39), id West Ridings (36), and Midland (33), and was in North Midland The rates in the other regions rn (25), London and South Eastern (25), Southern (26), uth Western (29)—were all less than the general

Among the towns with populations exceeding the following had the highest rates Liverpool (44), on upon Hull (41), and Coventry and Newcastle yne (39) The lowest rates were recorded in the ig large towns Harrow (20), Leicester (23), Ports (24), London (27), and Croydon (28), while the olitan borough of Lewisham had an exceptionally e of 19 The rate in Oslo was 20 and in Paris 48

Survey of Sickness

the people interviewed about their health in the nber quarter, 1949, 64 9% out of 8778 men and out of 10,847 women had suffered from illness or during October, November, or December [1] The ponding figures in the December quarter, 1948, 65 6% and 75 5% The percentage of men who lted a doctor during a month was 41 5 and that omen 48 0, the latter figure having dropped from year earlier The average number of days' incapa- in a month due to sickness was 1 12 among men 1 30 among women Housewives (65% of the en interviewed) consulted doctors to the same at as other women A higher proportion of them red some illness or injury (77 6% per month), but reported less incapacity (1 15 days per month)

Deaths in 1948

ne medical tables volume of the Registrar General's istical Review for 1948 [1] records that 468,645 ians died in England and Wales during that year decrease of 46,940 from the previous year's figure gave a crude death rate of 11 0 per 1000 civilian ulation, the lowest ever recorded in this country, previous lowest rate was 11 4 in 1930, when the ber of deaths was 455,427 Of the deaths, cancer unted for 16 9%, compared with 15 1% in the ious year and 13 9% in 1938

ronary Disease—Deaths due to diseases of the coronary ries and angina pectoris again showed a substantial ease numbering 36,640, compared with 33,168 in 1947, 80 in 1946, and 15 409 in 1938 Discounting the changes he sex and age structure of the population the mortality n this cause has practically doubled over a period of years

ancer—Male mortality from this cause again increased 1948, while female mortality showed a slight decrease n the two previous years The decline in deaths from cer of the mouth continued, but as noted in previous nt years, other affected sites showed increases Cancer he respiratory system showed increases for both sexes 5 for men and 2158 for women, compared with 8603 2019 in 1947) representing just over half the total increase ancer mortality

phtheria—Deaths from diphtheria numbered 155 in 1948, ared with 242 in 1947 and 2861 in 1938 This represents of about 95% in mortality from this cause over the ears (During 1949 only 85 deaths from this were ered)

ad Deaths—There were 3859 (2809 male and 1050 female) s due to road accidents in 1948, compared with 4187 47 and 7314 in 1939 Of the 3859 persons killed, 2041) were pedestrians, 722 (19%) were pedal cyclists and (8%) were motor-cyclists Of the pedestrians and -cyclists (total 2763), 694 (25%) were children under ars of age

aths of Infants and Mothers—The infant mortality rate 34 per 1000 related live births (compared with 41 in and 43 in 1946) and was the lowest recorded in this ry up to that time (The provisional rate for 1949 2 per 1000) The maternal mortality rate was 0 86 per live and still births compared with 1 02 in 1947 and n 1946, in 1938 the rate was 2 70

[1] Registrar General's Statistical Review of England and Wales 1948 Tables Part I. Medical H M Stationery Office Pp 362 7s

In England Now

A Running Commentary by Peripatetic Correspondents

We have been having some sporadic cases of primary atypical pneumonia in this district, so when I was told that John, aged 5, had a persistent cough and had been feverish for five days, the scattered râles at both bases and high titre of cold agglutinins made me add him to the list He seemed a fairly severe case and I felt that 'Aureomycin' was justified The dosage schedule was laid down, but John insisted on being left alone to swallow each capsule as it became due To the mother I confidently foretold improvement for the morrow and a change on the chart from jagged peaks to a steep and steady decline And so it was The curve flattened below the thick black line and remained there His appetite improved Mother and doctor congratulated each other on the wonders of modern science

This morning all the capsules were found in a little pool of dried saliva at the bottom of the wardrobe John isn't so well today Neither he nor his doctor can look one another straight between the eyes

* * *

I can still remember the surprise of a colleague of mine during our first year as medical students on learning that Anatomists cut up "real people," and there can be no doubt that merely because of their choice of a medium for self expression, Anatomists tend to be regarded as a race apart They live generally at the very top, or else at the very bottom, of large forbidding buildings and often surround their dissecting rooms with inscriptions in Latin or Greek designed to quell the ebullience of youth In addition, they talk a strange Romish tongue It often turns out, therefore, that to the sensitive student one Anatomist constitutes a crowd, and two, particularly under the noms de guerre of "internal" and "external," induce an insufferable sense of claustrophobia.

It may be that this feeling is to a certain extent shared by the Anatomists themselves, for in an age of International Congresses they have shown themselves singularly chary of congregating Until this year, in fact, no International Anatomical Congress had been held on British soil The congress at Oxford last week, however, demonstrated that, when put to it, Anatomists can Congregate with the best Their consumption of morning coffee and afternoon tea—always the barometer of a successful congress—was well up to British Physiological standards which are among the highest in the world, and the mad lust for Excursions, which glows in the hearts of all true Congregators, leaped into flame in many Anatomical breasts, so that it was reported that at least one Anatomist found himself simultaneously in two buses proceeding in opposite directions In short, Anatomists, like their raw material, are real people

I sat in an inconspicuous seat to the right of the median plane, inferolateral to the lantern and two thirds of the way along a line joining the lecturer to the superior ventilation duct, with the hard bench inferior to my posterior As far as the eye could reach in all directions around me were Anatomists What would they discuss, these clear eyed men who had read through big Cunningham (and some of them even through Gray also)? "Some remarks on an anomalous contribution to the lesser superficial petrosal nerve in a pair of anencephalic heterozygous twins"? "Three cases of persistent reduplication of the intermediate layer of the suspensory ligament of Treitz, with some observations on the morphogenesis of the recurrent branches of the Batrachian sphenopalatine ganglion"? I sat back and prepared myself to allow the measured incomprehensible periods to flow over me But Anatomy is not what it was, the subject matter catered for all comers, from the sophisticate interested in how his fingers and thumbs work down to the ingenuous clinician seeking information on the action of streptomycin or the mode of spread of virus diseases

Surgeons and medical students often suppose—and often rather sourly—that the only reason why Anatomists get together is to authorise yet a further change in

serving on regular commissions in the R A M C into line with those applying under the National Health Service — Mr STRACHEY replied The rates of pay of medical officers and specialists in the R A.M C are now being examined Account will be taken of the average earnings of doctors under the National Health scheme

Civilian Specialists

Major MACPHERSON asked the Minister what was the present scale of pay and allowances offered to specialists attached to the R A.M C in a civilian capacity, for home and overseas service respectively —Mr STRACHEY replied Civilian specialists serving at home are paid £1300 or £1600 a year according to experience and qualifications Abroad they are paid £1800 or £2200 a year and receive an outfit allowance and a local allowance varying from £25 to £425 a year according to the station and whether they are married or single These allowances are common to all civil servants of comparable grades Free single accommodation and, in certain stations, free messing are also provided

Hospital Administrative Staffs

Replying to a question, Mr A BEVAN said that detailed hospital surveys to determine what should be a reasonable ratio of administrative to medical staff and to patients, as a guide to hospital boards and committees, were about to begin

Beds for the Tuberculous

Mr A E MARPLES asked the Minister how many beds suitable for tuberculous patients were empty, and how many could be used if there were staff available —Mr BEVAN replied Hospital returns at Dec 31 last showed that approximately 5000 such beds were unoccupied on that date, of which about 4000 stood closed for lack of staff

Replying to questions suggesting that further facilities should be afforded for the treatment of tuberculosis cases in Switzerland, Mr BEVAN said I cannot undertake in present circumstances to add to the cost of the health service as proposed, but I have recommended to hospital authorities action for making the best use of our own resources

Reduction of Extraction-rate of Flour

In answer to questions, Mr MAURICE WEBB, Minister of Food, said it had been decided to reduce to 80% the extraction rate of flour used for the national loaf This would be made up of home milled national flour with a rate of 81%, and a proportion of imported flour with a lower rate The change, which would take effect on Aug 27, would enable the public to get a whiter and more generally acceptable loaf while still meeting the standards recommended by the Post war Loaf Conference It would also add to the quality and quantity of our supplies of animal feeding stuffs

Dr BARNETT STROSS Is the Minister aware that the 85% extraction rate, together with the high consumption of liquid milk, was responsible in the main for the continuously improving conditions in the health of the nation and will he tell the House that he does not contemplate any further degradation of that standard? Mr WEBB This is our decision, and on it we stand We have decided that it was possible to reduce the extraction rate at this point because of the high nutritional value of the extra amounts of other kinds of food which we are now able to supply

Dr STROSS asked the Minister what was the iron content of wheaten flour at the rates of extraction 85%, 80%, and 72% —Mr WEBB replied This depends on the grists (that is, the mixtures of wheat) But typical figures for 85%, 80% and 72% extraction rates are 2 1, 1 65, and 1 25 mg per 100 g of flour

Tuberculosis in Scotland

Mrs JEAN MANN asked the Secretary of State for Scotland what consideration he had given to the report of the Scottish Committee on Tuberculosis Service in Scotland and if he would make a statement on the recommendation of crisis expansion of tuberculosis service —Miss MARGARET HERBISON replied With his officers the Secretary of State has been studying carefully this report but has found in it no recommendation for the expansion of facilities which has not already been considered whilst most of the recommenda tions have been tried with varying degrees of success In he last two years more than 300 additional beds have been brought into use for respiratory tuberculosis, mostly in infectious diseases and general hospitals. The my right hon friend proposes to continue especially hospitals where nursing staffs are strongest

Cruelty to Children

In the House of Commons on July 20 Mr Chuter Home Secretary, in a statement on the report of ment working party, which was appointed to cruelty and neglect of children in their homes, said Government had reached the conclusion that the need was not for an extension of statutory powers, inquiry by a departmental committee, but for the coördinated use of the local authority and other and voluntary services available Local authorities had wide powers to assist families, and health visitors, school attendance officers, and others in regular children were in a position to assist in bringing neglect or ill treatment to light In addition, organisations, in particular the National Society for Prevention of Cruelty to Children and the Royal Society were engaged in work in this field. The of local statutory and voluntary effort could not, used to the best advantage unless there was coördination It was of the first importance that help needed should be given at an early stage, and that should reach the service which could be of most before valuable time had been lost and harm had been If the right help was not given in time, children who otherwise have remained with their parents might have removed from home because deterioration had gone

The Government, he continued, had accordingly that the right course was to ask local authorities to arrangements designed to ensure that action was to make the most effective use of the available statutory and voluntary alike The councils of counties county boroughs (in Scotland, the councils of counties large burghs) were being asked to make suitable arrangements to secure coördination among all the local services, and voluntary, which were concerned with the welfare children in their own homes This might well be achieved by designating an officer of the local authority whose would be to ensure such coördination. By this significant cases of child neglect and all cases of ill treatment coming to the notice of any statutory or voluntary in the area could be considered, and agreement reached to how the local services could best be applied to meet need The Government were convinced that it was on lines that the problem could best be tackled and confident that local authorities and voluntary organisations concerned could be relied upon to coöperate freely in put the arrangements into effect

Food-poisoning

Replying to a question, Mr BEVAN stated that 63[illegible] of food poisoning had been notified to medical officers health in the twelve months to March 31, 1950

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis the week ended July 22 numbered paralytic cases (152), non-paralytic 71 (60), total 260 (212). The total increase of 48 on the figures for the previous (shown in parentheses) London contributed 20, Warwick 5, Stafford and Essex each 3, and Worcester Lancaster each 2 Four counties contributed 40% of total notifications Warwick had 43 cases, London Lancaster 24, and Stafford 24 Thus there is no evidence of any considerable spread to fresh areas

Infant Mortality in 1949

Last year the rates of infant deaths in various of the country showed wide differences [1]

For example the England and Wales over-all rate 32 per 1000 related live births was exceeded in the following

1 The Registrar-General's March Quarterly Return, No. 40[illegible] Stationery Office. Pp 36 1s

out his life Gosset stood for simplicity and . He disliked formulæ, and I am sure he would approved of little books purporting to teach in a couple of hours He would never have said so elaborate, but he seemed to feel that the of not carrying any argument back to first s far outweighed the little time saved

is medicine so impermeable to these simple ideas, are commonplace in almost every sphere of com production where bankruptcy weeds out the nt ? Is it because there is no bankruptcy and the nce of a departmental chief rises as his depart- becomes more expensive ? Or is it because no nental chief can run ahead of the public opinion institution which he serves ? Clinical patho have a unique opportunity to educate medical in the meaning of the ± sign after a measurement ommercial laboratory statistics are practised, not , and the most junior lab boy learns in a few to handy standard errors To return to the ular Does any hæmatologist who knows the l history, the hæmoglobin, and the hæmatocrit g, and who has a stained blood film in front of him, ny further aid in diagnosis from a red blood cell which is likely to be more than 10% out in a third es, and more than 20% out in 1 in 20 cases ? Have atients derived any benefit from these counts, or millions of hours during the last thirty years been dered on boring work just because doctors are ood at arithmetic ?

don Hospital, E 1 DENYS JENNINGS

—Since I wrote the above, Dr Campbell's letter ly 29 has illustrated an important point A patient successive counts with a colour index of 1 06–1 11 variability of 2 5% instead of the expected 11% us tests to which his figures can be submitted st that they are "improbably" good Dr bell has selected this case and that could be the nation Analysis of blood-counts from different atories, however, suggests that most good tech- is are "improbably" good Consciously or sciously, they maintain a consistency in the r index, which is almost certainly impossible Campbell's explanation is not acceptable Like most ibutors to medical literature he confuses two ely different statistical arguments If a patient's blood count is 3 million red cells and if there is no the most likely figure which a good technician will is 3 million, and a count of 2 million or of 4 million, likely But that is not the problem which confronts practice when the technician tells us that the count million and we want to know what the most likely t is The answer to the practical problem depends e type of case referred to the laboratory In a bad where 25 times as many patients with counts of llion are referred as patients with 3 million the 50 chance of a patient with 4 million being mis ted as under 3 million is about the same as the 1 in 2 ce of the patient who really has 3 million In r words, when the laboratory returns the red-cell t as 3 million ±400,000, the most likely count may be 3,700,000 The paradoxical situation thus arises the reference of normal patients to a laboratory nishes the reliability of its reports Dr Brailsford pointed out in non mathematical language that the consideration applies to X-ray reports

ACTION OF ASPIRIN ON THE COLON

R,—When I first had a "temporary" sigmoid tomy seven years ago, for rectal stricture following ative colitis I had vague hopes of rivalling Pavlov Wolf and Wolff by observing its behaviour Alas, from a few practical details, I have learnt nothing it worthy of record, with one possible exception— action to aspirin

Usually my morning washouts work like a series of enemas, I pump in a pint or two of water with my Higginson until, with a visible contraction of the protruding bowel, the whole lot, with fæcal additions, is rapidly and violently returned But occasionally these explosive contractions do not occur, instead, after 2–3 pints has gone in, the water begins to well gently out again, and the bowel can only be emptied by pommelling the abdomen and doing trunk-bending sideways exercises

When this had happened several times I noticed that it followed a dose of aspirin overnight Since then I have become fairly certain that gr 10 of aspirin stops my colon contracting normally when distended twelve hours or so later And the effect is the same whether the aspirin has been taken for lumbago or toothache or for the more usual headache

ORION

SURGICAL OPERATION AS TECHNICAL ASSAULT

SIR,—In view of the report in your issue of June 24 (p 1168), it has been thought desirable to remind practitioners of the need to obtain proper consents in writing from patients or their relatives when the procedure recommended involves operative treatment

It would appear to be necessary to make it clear to patients and/or relatives alike that when a patient is admitted to hospital for operative treatment, the operation proposed will not be performed necessarily by any particular surgeon who may have seen the patient previously or under whose name he is admitted The forms of consent given below are considered appropriate by the solicitors to the Medical Defence Union

CONSENT BY PATIENT

To the Medical Staff and Committee of Management of the _____ Hospital

I _____ of _____

hereby consent to undergo the operation of _____ the effect and nature of which has been explained to me

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anæsthetic for the purpose of the same

I understand an assurance has not been given that the operation will be performed by a particular surgeon

Dated this _____ day of _____

(Signed) _____

CONSENT BY RELATIVE

I _____ of _____

the _____ of the above named _____ hereby also consent to such operation

Dated this _____ day of _____

(Signed) _____

(The formula of consent by the spouse or near relative although not strictly necessary in law may save trouble afterwards)

CONSENT FOR MINOR

To the Medical Staff and Committee of Management of the _____ Hospital.

I _____ of _____

hereby consent to the submission of my child _____ to the operation of _____ the effect and nature of which has been explained to me

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anæsthetic for the purpose of the same

I understand that an assurance has not been given that the operation will be performed by a particular surgeon

Dated this _____ day of _____

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CONSENT FOR ELECTROCONVULSIVE THERAPY

To the Medical Staff and Committee of Management of the _____ Hospital.

I _____ of _____

hereby consent to the administration of convulsive therapy the effect and nature of which has been explained to me Notwithstanding the fact that there are certain risks of injury inherent in the treatment I request you to administer the same to me and I accept any risk attaching to such administration

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Medical Defence Union
49 Bedford Square
London W C 1

ROBERT FORBES
Secretary

Anatomical nomenclature Even these notoriously cynical men will be glad to hear that on this occasion the temptation was resisted, though there are sinister possibilities within the next few years I am also privileged to report that among themselves, and relieved of the necessity for putting a bold front on things before their students, Anatomists are just as prone as common clay to talk about the foramen of Winslow or the Y-shaped ligament of Bigelow

Among the tintinnabulation of Anatomical shop in a multitude of foreign tongues and accents I could detect no syllable of Russian, apparently the Party Line on topography has not yet been established securely enough for a delegation to be permitted There were, however, plenty of dialectics and not a little materialism, which proved greatly to the taste of the assembled Congregators, while the Associate Members—who, as is well known, determine the success or failure of any congress—were at once soothed and stimulated by an atmosphere compounded of tea, sherry, Stratford on Avon, punting, and omnibuses In the result, the congress dispersed in an entirely satisfactory frame of mind to sharpen its scalpels and revise the relations of the radial nerve (or musculospiral) against the coming winter

* * *

The spoilt and well-provided neuter cat, ignoring his basket, spends his days luxuriating on a bed, a sofa, in an armchair, the airing cupboard, or that in which I keep my clothes All night he prowls about, preferably in the rain, catching field mice or half grown rabbits which he brings in and devours, fur and all, on the drawing-room carpet Why?

The elderly kitchen bitch, an ingratiating cupboard lover with a taste for maternity unassuaged by the passage of years, has recently nidified and brought forth six assorted pups in the hollow of a root, bang in the middle of the hedge behind the coal-shed, spurning the comfortable and convenient kennel provided by the management Why?

It would be hard to find any living thing more unaccountable than my domestic animals—except, of course, my patients

* * *

It is pleasant to record how much the delegates from 50 odd countries to the fifth International Cancer Congress, held in Paris, have enjoyed their experience of French hospitality The congress opened at the Sorbonne on "Dimanche, 16 Juillet, 1950, à 9 heures 30 très précises," and, though 9 30 A.M on Dimanche is always a bit of a strain, the opening was well worth seeing A military band, 70–80 strong, occupied one side of the platform, and as the President of the Republic entered they played the *Marseillaise*

As is almost inevitable at large congresses, some sections were (rarely) ahead of the time schedule and others were (frequently) well behind But the delegates were a benign crowd on the whole, and the only sign of malignancy was the rate of metastasis to restaurants and shows when the day's work ended The Grand Banquet and trips to Versailles and Reims were among the memorable social events

The Sorbonne was an ideal site for the congress Few of us newcomers will forget that grand old building and its warren of lecture-rooms Fortunately, these rooms were named and easily found, and soon one was rushing confidently from "Turgot" to "Michelet" or from "Richelieu" to "Guizot" The little lecture-theatre called "L Liard" is exquisite Behind the platform is a large painting of Richelieu, down the left side of the room there are oval portraits of Pascal, Bossuet, Descartes, and Racine, at the back we have Corneille and Molière, and yet another painting decorates the ceiling

* * *

The National Health Service has wrought changes in the correspondence we consultants receive, and it did not surprise me to be addressed as "Dear Madam and asked to name the day for fitting the writer with a corset and "bra" But it was a bit of a shock to see on the envelope "To Doctor, Ministry of Corsetry, St X's Hospital

Letters to the Editor

ACCURACY IN RED-CELL COUNTS

SIR,—Your leading article of July 15 would greater force if a clearer distinction had been between the different kinds of error

Successive samples differ from each other successive handfuls of coins contain different heads and tails The inevitable inconsistency repeated measurements depends on the size of It is calculable, and it is distributed normally error which arises when a team of experts use reservoir of pooled blood is not calculable and is certainly not distributed normally it is discov course of a series of observations, and it is dang assume that it applies to other workers under dif conditions The third type of error is the only one concerns the practising consultant, and for some or other it is considered almost indecent to What is the actual error which occurs in practice which is increased by such imponderables as the being kept awake all night by his baby teething is no doubt that it is considerably larger than the error, but its distribution is sharply curtailed at extreme by medical supervision, which leads to stained film being examined when the colour and "odd," and by "faking"

Let us take E_T, the total error, as 10–11% which a low estimate $E_T = \sqrt{E_w^2 \pm E_s^2}$ where E_w is working error and E_s is the theoretical sampling er If 500 cells are counted, E_s is just over 4%, and E_w the working error, is about 10% Automatic meth of counting which reduce the sampling error to a half a fourfold increase in the number of cells counted will have an almost imperceptible effect on the total er

The work of W H Gosset ("Student"), whom cited, deserves to be recalled When Gosset left N College and went into Guinness's in 1899 to devote hims to the clinical pathology of beer, commercial labora were as haphazard as modern hospitals Lack statistical sense partially sterilised applied science made it too expensive Lack of the experimental look had endangered the reputation of statistics C combined both disciplines in an almost ideal way was ready as a statistician to state a research project mathematical terms from first principles, and as experimenter his enthusiasm was aroused when plausible theory proved false in practice Three of principles should be heeded more closely in medic Theoretical estimates of error tend to be too small, like other statistical deductions must be repeat checked in practice Estimates of error based Tuesday's work in the laboratory are unlikely to good for Fridays, when the staff is tired There ebb and flow of accuracy which follows the same as accident proneness

The second principle follows from the first Technic are not machines, and experience can create unexpected sensitiveness Budge Patty, at ten and Bobby Locke, at golf, measure the strength of shots with an accuracy which is almost incredible we come to turn it into percentages Divided conse ness is an enemy of this kind of accuracy The obse must put complete faith in his senses The possi of conscious or unconscious cheating is a hundre There must be no bias resulting from a knowledge what the answer ought to be

The third principle derives from commerce Meas ments and statistics cost money, and increasing ac means increasing expense Honest costing is an essen aid in deciding on the distribution of one's rese Elaborate measuring devices should not be preferre the trained senses without giving both a fair

ɴut his life Gosset stood for simplicity and He disliked formulæ, and I am sure he would approved of little books purporting to teach ɪn a couple of hours He would never have said so elaborate, but he seemed to feel that the of not carrying any argument back to first ɜ far outweighed the little time saved

ɜ medicine so impermeable to these simple ideas, e commonplace in almost every sphere of com production where bankruptcy weeds out the t? Is it because there is no bankruptcy and the ɪce of a departmental chief rises as his depart comes more expensive? Or is it because no ental chief can run ahead of the public opinion institution which he serves? Clinical patho ɪave a unique opportunity to educate medical ɪn the meaning of the ± sign after a measurement nmercial laboratory statistics are practised, not and the most junior lab boy learns in a few o bandy standard errors To return to the ɪr Does any hæmatologist who knows the history, the hæmoglobin, and the hæmatocrit and who has a stained blood film in front of him, further aid in diagnosis from a red blood cell which is likely to be more than 10% out in a third es, and more than 20% out in 1 in 20 cases? Have atients derived any benefit from these counts, or millions of hours during the last thirty years been dered on boring work just because doctors are ɔod at arithmetic?

don Hospital E 1 DENYS JENNINGS

—Since I wrote the above, Dr Campbell's letter ly 29 has illustrated an important point A patient successive counts with a colour index of 1 06–1 11 a variability of 2 5% instead of the expected 11% ɔus tests to which his figures can be submitted est that they are "improbably" good Dr pbell has selected this case and that could be the ination Analysis of blood counts from different ratories, however, suggests that most good tech ns are "improbably" good Consciously or nsciously, they maintain a consistency in the ur index, which is almost certainly impossible Campbell's explanation is not acceptable Like most tributors to medical literature he confuses two rely different statistical arguments If a patient's blood count is 3 million red cells, and if there is no , the most likely figure which a good technician will h is 3 million, and a count of 2 million, or of 4 million, likely But that is not the problem which confronts ractice when the technician tells us that the count illion and we want to know what the most likely is The answer to the practical problem depends type of case referred to the laboratory In a bad here 25 times as many patients with counts of on are referred as patients with 3 million, the 0 chance of a patient with 4 million being mis d as under 3 million is about the same as the 1 in 2 of the patient who really has 3 million In words, when the laboratory returns the red cell as 3 million ± 400,000, the most likely count may 3,700,000 The paradoxical situation thus arises he reference of normal patients to a laboratory shes the reliability of its reports Dr Brailsford inted out in non mathematical language that the onsideration applies to X ray reports

ACTION OF ASPIRIN ON THE COLON

—When I first had a "temporary" sigmoid my seven years ago, for rectal stricture following ive colitis, I had vague hopes of rivalling Pavlov f and Wolff by observing its behaviour Alas, rom a few practical details, I have learnt nothing worthy of record, with one possible exception—tion to aspirin

Usually my morning washouts work like a series of enemas, I pump in a pint or two of water with my Higginson until, with a visible contraction of the protruding bowel, the whole lot, with fæcal additions, is rapidly and violently returned But occasionally these explosive contractions do not occur, instead, after 2–3 pints has gone in, the water begins to well gently out again, and the bowel can only be emptied by pommelling the abdomen and doing trunk bending sideways exercises

When this had happened several times I noticed that it followed a dose of aspirin overnight Since then I have become fairly certain that gr 10 of aspirin stops my colon contracting normally when distended twelve hours or so later And the effect is the same whether the aspirin has been taken for lumbago or toothache or for the more usual headache

ORION

SURGICAL OPERATION AS TECHNICAL ASSAULT

SIR,—In view of the report in your issue of June 24 (p 1168), it has been thought desirable to remind practitioners of the need to obtain proper consents in writing from patients or their relatives when the procedure recommended involves operative treatment

It would appear to be necessary to make it clear to patients and/or relatives alike that when a patient is admitted to hospital for operative treatment, the operation proposed will not be performed necessarily by any particular surgeon who may have seen the patient previously or under whose name he is admitted The forms of consent given below are considered appropriate by the solicitors to the Medical Defence Union

CONSENT BY PATIENT

To the Medical Staff and Committee of Management of the _____ Hospital

I _____ of _____

hereby consent to undergo the operation of _____

the effect and nature of which has been explained to me

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anæsthetic for the purpose of the same

I understand an assurance has not been given that the operation will be performed by a particular surgeon

Dated this _____ day of _____

(Signed) _____

CONSENT BY RELATIVE

I _____ of _____

the _____ of the above named _____ hereby also consent to such operation

Dated this _____ day of _____

(Signed) _____

(The formula of consent by the spouse or near relative, although not strictly necessary in law may save trouble afterwards)

CONSENT FOR MINOR

To the Medical Staff and Committee of Management of the _____ Hospital

I _____ of _____

hereby consent to the submission of my child _____

to the operation of _____ the effect

and nature of which has been explained to me

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anæsthetic for the purpose of the same

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Medical Defence Union
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ROBERT FORBES
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LARYNGEAL VERTIGO

SIR,—The description of laryngeal vertigo in your leading article of July 15 is, no doubt, correct for the majority of cases However, a prolonged bout of coughing is not necessary for the production of this syndrome, as can be seen from the following case report

A man, aged 52, was recently seen in the outpatient department complaining of attacks of loss of consciousness At the age of 35 he had developed asthma, to which he had since remained liable His asthmatic attacks always began with a short bout of coughing At the age of 48 he had developed his present complaint He would begin a bout of coughing indistinguishable from those preceding his asthmatic attacks, but after the very first cough he would fall unconscious to the ground Onlookers had told him that he was not convulsed, he was never incontinent, and recovered in a few seconds These attacks were not followed by asthma

He was not overweight, and the blood pressure was 140/80 mm Hg There was moderate clubbing of the fingers and numerous expiratory rhonchi in the chest There were no abnormal signs in the nervous system Radiographs of the skull and chest were not helpful, and the electro encephalogram was within normal limits

The immediate onset of unconsciousness following one short cough would appear to exclude cerebral anæmia as a cause in this patient Similar cases can be found in the literature and in one of Charcot's cases[1] it was specifically stated that a short cough preceded the attacks, and that prolonged bouts had no such sequel The theory of cerebral anæmia can scarcely be regarded as proven

I am indebted to Dr F R Ferguson for permission to report this case

Department of Neurology
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SIR,—About five years ago I had one attack of this dramatic complaint, it came on after dinner

While talking I inhaled a mixture of tobacco smoke and steam from hot coffee, I remember a momentary catching of the breath but no struggle or suffocation, and unconsciousness was practically instantaneous Perhaps a moment later consciousness gradually returned, but in another minute I was perfectly well, wondering what all the fuss was about The really astonishing feature was the complete absence of struggle and the sudden total unconsciousness

Six months after this experience, my son dropped a bull terrier dog, 2½ years old, over the side of a pram dinghy into a river The dog was used to swimming and had been in the water off and on for some hours The dog went straight down, with his four legs stretched out rigidly, and my son could follow him with his eyes for quite a distance, and without any sign of a struggle he was drowned

Since that time I have heard of a number of cases of people drowning after diving or falling into the water where there has been no evidence of any struggle

Perhaps laryngeal vertigo is commoner than has been supposed, not confined to elderly men, and it may be the cause of many unexplained deaths by drowning

Liverpool P ELDON GORST

SIR,—The type of cough leading to the condition of "laryngeal vertigo," described in your leading article of July 15 as "a hard jerky series of unproductive coughs against a closed glottis," does not correspond with my experience It might be added that a closed glottis and the act of coughing are incompatibles

The similarity of these cases to whooping cough without the whoop is striking The subjects of this condition cough 15–20 times before taking a breath, after the first 5 coughs no air is expelled, since only residual air remains Hyperirritability of the air passages seems to be the immediate cause of the failure to inspire—doing which would promptly relieve the cerebral venous congestion I have found that codeine effectively reduces the number of spasms, which have altogether after a few weeks This suggests passing infection may have been present

I would suggest, firstly, that a diagnosis of be considered in such cases, diagnostic aid being able from a leucocyte count and cough plate, secondly, that the term laryngeal vertigo be given I offer in its stead "cough syncope" and "convulsions" This term would comprise phenomena occurring in whooping cough, which essentially the same

Dulwich Hospital,
London S E 22 BERNARD FERG

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SCREENING TEST FOR CORTISONE SUBSTITUTES

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It may be of interest in this connection that lingual administration of noradrenaline also p significant eosinopenia—a fact which I have not recorded

Isopropyl noradrenaline sulphate was used in these ments In people in whom injection of 0 4 mg of produced an eosinopenia of 50–60% of the initial value 4 hours, perlingual administration of one tablet (20 mg noradrenaline was followed by a drop in eosinophil 90–100% after the same time

Oral administration of noradrenaline may there also be capable of producing an A T C H like action.

With regard to the eosinophil count, the follo technique has given us consistent results

Blood is drawn to the 1 mark in the leucocyte pipette diluted with an eosin solution.[1] The pipette is gently thirty times, and both chambers of a Neubauer hæm meter are filled immediately The eosinophils in all large squares of each chamber (18 large squares) are co within the next 3–5 minutes, and the total divided by 18 multiplied by 100, giving the number of eosinophils per c

London W 1 H UCF

1 Forsham, P H Thorn G W Prunty F T G, Hills A. *J Clin. Endocrinol* 1948 8 15

DIAPHRAGMATIC HERNIA AS A CAUSE OF ANÆMIA

SIR,—In your leading article of July 29 you men that anæmia associated with diaphragmatic hernia been seen in children, but I should like to emphasise relatively common occurrence in childhood, bec many physicians still regard it as an extreme rarity spite of the abundant literature which has accum since 1918, when Downes[2] reported a case in a boy seven

These children usually come to notice because increasing pallor and are treated as cases of sim anæmia for varying times before the true cause discovered The anæmia is usually hypochromic microcytic, but it may be macrocytic with normob or megaloblastic marrow, or of a mixed type correspo to Trowell's dimorphic anæmia There is often no h suggesting loss of blood in the stools, and only occa symptoms referable to the hernia, such as recu vomiting The possibility of this diagnosis should, fore always be considered in cases of anæmia in child which do not respond quickly to hæmatinic drug which relapse after an initial response

It is difficult to accept the explanation that anæmia is due to blood loss from hæmorrhage al and many authorities, notably in France, are opposed this view, since, in most cases, in spite of severe anæm no bleeding point can be demonstrated, and Fre workers have shown that there is often no blood in

2 Downes W A *Ann Surg* 1918 67 748

Many possible contributory causes have been d, such as deficiency of intrinsic or extrinsic nability to absorb iron, and other nutritional But the gastric juice is usually normal, with e intrinsic factor, and in most cases no deficiency an be demonstrated

ork of Cameron, Watson, and Witts[3] in Oxford row some light on the ætiology of this type of , for they produce new evidence in support of an her disfavoured theory In investigating the which often accompanies intestinal stricture oduced a macrocytic anæmia by forming blind f intestine in rats, the essential feature being on of intestinal contents They suggest that the is produced by toxins or changed bacterial the blind loop which destroy or otherwise use up nopoietic factors Is it not possible that some nechanism contributes to the anæmia of gmatic hernia ?

ld suggest, Sir, that, your explanation of the cause simplified, and that, although in many cases hage may be the main factor, deficient intake, of absorption, and stagnation of visceral contents o play a part

Hospital for Sick Children
Edinburgh. R G MITCHELL

NIFICANCE OF THE DISCOVERY OF THE EFFECTS OF CORTISONE

-I am fascinated by the refreshing article[4] respondence[5 6] on disease processes

ould regret the passing of "focal sepsis" and pared to put in a good word for it I should sorry if the "general adaptation syndrome" allborn, for that would excuse many, including from the unequal task of mastering it But is a possibility of interring the "psychosomatic esis," I am really roused, and willingly lend a

n tempted into this tricky correspondence by R Venning's[6] confident reference to the "widely d correlation between personality types and the nce of particular diseases, of which *perhaps t examples are ulcerative colitis, migraine, hyper , and peptic ulcer*" Three of these conditions treated surgically for many years From the fourth er two on the list) I am myself a sufferer—mildly casionally but unmistakably, with all the classical oms In my opinion the "personality type" se maladies is inconstant, unless we confuse ality with the mental attitude created by the Relieved of their troubles by successful surgery, s from groups one, three, and four, are no different their fellows and are indistinguishable apart ese are "perhaps the best examples"

ny there be who doubt this statement, I would t a psychological study of sufficient numbers of atients at a suitable interval after the successful tion of their treatment

rsity of Liverpool CHARLES WELLS
Professor of Surgery

—There is one matter that should be mentioned fessor Pickering's dismissal of psychosomatic ne is to be seen in its proper perspective The rofessor Choyce used to speak of the waters of that flowed between the anatomy and physiology nents and the medical schools Of only one of medicine is this still true and that is the relation of the emotions to bodily health There is a long and honourable tradition of physiological study, which academic medicine in this country has refused to carry on, either directly or by providing facilities for others The psychiatrists have their own word for this, but it does seem remarkable that the natural curiosity of medical scientists, to put it no higher, has led to so little exploration of this field Academic medicine may be entitled to dismiss psychosomatics for lack of evidence In fairness it should at the same time recognise its own responsibility for the deficiency

Willesden J N MORRIS

ron D G Watson G M. Witts L J *Blood* 1949 4 803
ring G W *Lancet* July 15 1950 p 81
ohn A P *Ibid* July 22, p 154 Leys D *Ibid* 29 p 194 Bourne A *Ibid* p 194
ng G R *Ibid* July 22 p 154

REGISTRAR APPOINTMENTS

SIR,—Dr Stewart, in his letter of July 15, has put in a plea for more appointments at registrar level for over sea postgraduates, I want to commend his suggestion most strongly to hospital staff committees

It would seem that the registrar is indeed a necessity to our hospital system under present establishments A registrar is a postgraduate with a knowledge of his subject and bent on acquiring breadth and depth of experience Not only from the Dominions but throughout Western Europe (and especially in Scandinavia) there are many such who are eager to work for a period in British hospitals, on my tour in Denmark this year I was asked many times how such an appointment could be arranged I did arrange one junior appointment last year for a Danish anæsthetist, and a deal of trouble it cost me—not from higher authority or the General Medical Council (at that level the scheme worked very smoothly) but from senior hospital staff However, the appointment was a great success, but many are turned away rebuffed or with a cold invitation to visit the hospitals as an observer, and so turn their eyes only to the United States, making both themselves and us the poorer

If Britain is to retain her proud position in the future as a centre for world medicine, at the same time enriching her own thought with the stimulus of fresh minds, and make her full contribution to international understanding, Dr Stewart's suggestion has much to commend it, and if put into practice could result in nothing but good

London W 4. PHYLLIS M EDWARDS

POSTURE

SIR,—I read with interest the letter of July 15 from Dr Gellner, on the influence during childhood of the heel of the shoe and the tilt of the head

None will dispute the desirability of a good posture, and it is easy to appreciate that the method of walking with a book on the head is effective In order to rectify some foot disturbances I have taught many children the following simple manner of walking to obtain a good poise

The heels, buttocks, shoulders, and head are all placed against a wall with the hands elevated high above the head The child is then taught to stretch the hands higher still, which will normally be about another inch This can only be done with the body fully upright its curves straightened out and with an adequate tightening of the abdominal muscles While the body is thus tense the arms are dropped and the shoulders relaxed, and the child is instructed to walk without stiffness, looking towards a point on a level with the eyes This exercise does undoubtedly give a good carriage and checks certain foot disturbances without the necessity of using a book.

The subject of posture is however, more complex than it at first appears We assume that the head erect position, being graceful, is the natural one But in walking the natural tendency is for the trunk to precede the feet We do not walk by placing the leg

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Notes and News

THE DOCTOR'S GUIDE

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first in front of the body, although this is the acquired method of the mannequin The first thing we do in walking is to incline the body forward from the ankle joint It is interesting to notice a line of guardsmen, whose posture is beyond reproach At the command "quick march" the whole line will be noticed to lean forward as a preliminary to the first step Is it not possible, therefore, that the slight pitching forward of the head is a natural anticipation of the manœuvre, and that the erect head is a state acquired either by specific exercises or the carrying of a weight upon the head? It does appear obvious that there is need to avoid obstacles immediately in front of us, and that looking straight ahead may not always be satisfactory A child would naturally look downwards, particularly in the tottering stage

The suggestion that the slight heel would necessarily tilt the body forward in a child cannot be accepted The body does not bend forward any the more because we walk downhill, if anything the tendency is to throw the body weight backwards to compensate for the incline The range of action of the ankle joint is indeed sufficient to compensate for sloping surfaces In the average adult flexible foot a considerable range is possible without tilting the body forward, and a child has an even greater range The toddler's slight heel can therefore have no influence on the positioning of the head

Civilisation may be responsible for many disorders, but it is doubtful whether the toddler's small heel can be rightly blamed for bad posture

London Foot Hospital W 1 H E WALKER

EXCRETION OF POTASSIUM AFTER PARTIAL GASTRECTOMY

SIR,—In your issue of July 22, Mr Wilkinson and his colleagues comment on the excessive excretion of potassium that may occur soon after operation It is tempting to suggest that this sudden loss of potassium is, like the more gradual loss of nitrogen, a result of the increased excretion of adrenal hormone after injury [1] The loss of potassium does not seem to depend on the development of an inflammatory reaction, for it may take place with other types of injury Albright [2] observed a transient rise in potassium excretion together with a rise in 17 ketosteroid excretion in a patient who, while on a metabolic balance study, received too rapid an intravenous infusion The phenomenon has been observed after exposure It has recently been described in dogs allowed to go into diabetic coma [3] It may be reproduced by stimulating the adrenal cortex with adrenocorticotropic hormone (A C T H) [4] or by giving Compound F—an adrenal steroid with "sugar hormone" activity [5] In these experiments the increase in excretion of potassium occurs without a rise in the serum level, so the effect of the hormone must be on the kidney The kidney does not conserve potassium and may even actively excrete it, so a deficiency can easily arise [6] It is not, however, easily demonstrated, since serum levels may not fall The liberation of adrenal hormone would also explain the sodium retention observed after operation, since sodium is retained when A C T H is given

Nuffield Department of Clinical Medicine University of Oxford PAUL FOURMAN

1 Talbot N B, Albright F, Saltzmann A H Zygmuntowicz A Wixom R *J clin Endocrinol* 1947 7 331
2 Albright F Reifenstein E C Forbes A P Conference on Metabolic Aspects of Convalescence 11th meeting New York 1945 p 45
3 McArthur J W Harting D Smart G A Talbot N B *J clin Invest* 1950 29 832
4 Bartter F C Fourman P Forbes A P Jeffries W M Albright F Transactions of 1st Conference on Metabolic Interrelations New York 1949 p 137
5 Fourman P Canadian Physiological Society proceedings of 13th annual meeting 1949
6 Tarail R Elkinton, J R *J clin Invest* 1949 28 99

Obituary

IVOR ISAAC PRICE

M B LOND, F R C S

Mr Ivor Price who died on July 24, at the age was born in London and educated at Daventry tion School He entered King's College Hos School in 1920, where he had a distinguished career as an undergraduate, winning a number of In 1925 he qualified and in the following year he the M B Lond He held the resident posts and the appointments of resident medical Queen Mary's Hospital to the East End, and superintendent at the Seaman's Hospital, Tilbury taking his F R C S in 1928 The previous year he entered the London County Council hospital serv he was on the staff of Bethnal Green Hospital Andrew's Hospital, Bow, till in 1938 he was deputy medical superintendent and senior s St Mary Islington Hospital In 1948 he consultant surgeon to the newly formed W Hospital, an appointment which he held to the his death

T St M N writes "One could not wish for a colleague than Price He accepted a case for with the greatest care, but he never turned awa an operation which might be of benefit to the pa however great the surgical risk Having taken patient, he treated him first as an individual, and as a surgical problem, sparing neither time nor effort his behalf In his resident position he saw and most of the surgical emergencies in a large hospital, and rapidly acquired tremendous experience He soon began to specialise in enterology, and he swiftly acquired a high and increasing reputation in this specialty among his col in North London

"An academic as well as a practical surgeon, he always alive to what was new and progressive in trends He was a good teacher, and many of his graduate students owed much of their success to friendly assistance From his juniors he expected high standard which he set himself, demanding the keenness, thoroughness, and self-sacrifice, but he generous with his praise for the good diagnosis, the suggestion, the successful surgical performance So and amusing, he was a great raconteur of incidents, often at his own expense He was inter in the hospital as a whole, and many of the staff grades regarded him as their friend His work was primary interest, and he could never accept the of his doctors to slow down and retire when the symptoms of his illness showed themselves. Inde had lately taken charge of the surgical side of a gastro enterological unit, where he was working within a few hours of his death"

Mr Price leaves a widow and a son aged five

GEOFFREY MICHAEL FULTON BARNETT

M B N Z, F R C S, F R A C S

Dr G M F Barnett, who died at the age of on July 13, while driving his car in Dunedin assistant surgeon to Dunedin Hospital and lect clinical surgery in Otago University

The eldest son of the late Sir Louis Barnett, K professor of surgery in Otago University, he was Dunedin and educated at Christ's College and University While still a student he served in Ga during the 1914–18 war After graduating at in 1920, he came to London and he held the p resident medical officer at Middlesex Hospital taking his F R C S He returned in 1925 to Dunedin he practised up to the time of his death For years he served as a member of the War Pensions Board A friend adds

"Of a quiet disposition, Barnett was beloved wide circle of professional colleagues, and by his pati A rugby footballer in his youth, he later was a keen and bowler"

His wife, two sons, and three daughters survive A third son was killed in the late war

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L E Garrett Angela M Geere R D Gibson A L A Gill S C Gomez John Gower B P Green, J L Griffiths, Richard Hart R F Harvey C McL Howat Roy Hill, Ronald Hincheliffe E R Huehns Anne Isaac Geoffrey Jessup P E F Kann, F M Kinsman, S F Knipe S S Lazarus David Lennie H E Lewis J A F Lord I W McClay R F McKnight, Sheina A Maclean M K Mason Jennie C Maurice Jones, Wah Chann Mok, R D Morbey, Ann E Morgan A H Mortimer G M Murphy Roy Nevendra Nauth Misir Theophilus Oladipo Olufemi Ogunlesi D W Orton E M Orton Kathleen M Parker J W Parkin J A Pedler J H Pell J E H Pendower Joan K Perkins, D A Plomer, A J Redenham G D Rees Alison M Richardson L H Roffey, I M Rosen, N L Rowe K. F K Rowson Hilary G Rubin P W Ruggles P S B Russell, M R Salkind, Gwendoline D Salter, D I Segall Hyman Silver, P R Stevens Eric Stokoe D T I Stuttaford G C Swain D R Sweetnam, Gwendolyn R Tapp I O Taylor W C T Thomas G W Thorpe J G Turner, W J A H Turner J M Walker H B G Webb J A Williams, K G Williams R I J Williams Donald Wiseman

The following diplomas were conferred conjointly with the Royal College of Surgeons

D L—R C Allison, W L Arnold D A N Barran I K Black H R Blades S O Bramwell C P Brown, D H P Cope Sheila A Costello A S Crawford Celia M Davies P S Dearden, J W Dundee D A Forbes Marion G Foster I N Cabali Rashbehari Ghose C M H Gunaratne W S Hart, E H Hopkinson R A House Evelyn M Lafferty, R E Lee Mair Llewelyn N G Marshall, Donald Matheson C J J Morkane T P Murray Barbara M Parker Cynthia M Parrott, Khondker Abu Sayeed Mohammed Abdul Quader D F G Sayers M W Smeeton A E Smith, D I H Smith W J Tyson A B Ward

D L O—Nazir Ahmad Mohamed Amjad Ali, C R Black A C Camm A R Curtis, H A Fraser D S Gideon B S Hilliar H M Mann Goli Subbarao Ramachandran Vaitialingam Rasanayagam Mahammad Shawaf M S Strong

D P H—N J Caldwell M J Collins R E C Copithorne Andrew T Evans K C Mackenzie, Noel Newman, James O Callaghan, Richard O Farrell

D P M—M W Annear A L Galea M M Glatt, T L Ives, S F Lindsay S J Rydlewski A R Samuel, J E G Vincenzi J H S Whyte G M Woddis

D C H—Edith I R Parfit Kandukur Prabhakar

D M R D—Violet Auld E A Beetles H S Bennett N N Blaxland D J Chapman Hyman Clain Denis Cockcroft W J J Czyzewski I O Jalman Subrata Ghose D T Glass G L Hardman, R T Hastings James, Vernon Hay Bolton, R M Hector K E Hodge E H Howarth, D C Light, M I Lochrin J K McCabe, R P C MacDonald E V M Medill I R Moyle A H R Muir J J O'Connell Sachchida Nand Prasad L L Ralph, J A Rankin, D F Reynolds K A Rowley M G Scott Debabrata Sircar W H Smith R F Stubbs G J MacA Tennon T F Thomas, W R R Thursfield E A Waldron D A H Walton, H B L Williams A R C Young

D M R T—James Ackerley Frank Batley E M Benton L G Capra Prasanta Kumar Dutt A J H Henning, Dorothy M E McGuire Ian McHattie, Prabhat Kumar Mookherjee, Dorothy J D Smith, J E Stapleton

D T M & H—Sanatkumar Hiralal Shah

D O—Mohammad Alimuddin H L Backhouse R H Baird Jagdish Charan Bass Fiona M. Bennett W G C Craigen Rajendra Pal Dhanda D B Dunlop Roy Ebenezer R F Elliott, Nora M English Bagir Ibrahim B U Killon Ella I Mackinnon, Satya Prakash, Prabhat Kumar Rai Chandhuri Arumbakam Visvanatha Rajagopal J P Robinson Tilak Raj Sakhuja, J H Scott, Kuei Yu Sun R St H Warren

D O M & S—P H Ball Ratan Noshirwan Bulsara, R B W A Cole, Prakash Chandra Ghosh Margaret M Harley, M. C Head Anna J Kesson J M. McKeogh, R A Morris, D J O Connor J L I Phillips Denis Plum T E Roche, Farhan Saif L F Samut A G Shanks, J R C Spicer, H S Sweet D S Thomson, L M Weerekoon

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Aug 8, at 3 30 P M, Prof Homer Smith, director of the department of physiology at the New York University and Bellevue medical centre, will deliver a lecture in the anatomy lecture theatre of Edinburgh University He is to speak on the Development of Modern Renal Physiology

Congress of Internal Medicine

The first International Congress of Internal Medicine will be held in Paris from Sept 10 to 14, under the presidency of Prof André Lemierre Further information may be had from Prof L Justin Besançon, 38, rue Barbet-de Jouy, Paris VII

The Heart Televised

Last Monday Dr J L D Silva professor of physiology at the London Hospital Medical College, and Dr John McMichael, professor of medicine at the Postgraduate Medical School of London took part in a television programme on how the heart works, how it can go wrong, and how heart-diseases are treated Patients, a pregnant woman, medical students, and animated diagrams were used to explain and demonstrate the various points, the heart sounds being recorded and amplified by an apparatus designed by Dr Bernstein The programme was the eighth in the 'Matters of Life and Death' series It was arranged by Dr Brian Stanford and was produced by Andrew Miller-Jones Future programmes will deal with the anæmias and tonsillectomy

Appointments

BODEN, G W B.SC Lond, M R C P, F F R D M R, London Hospital

BUCHANAN J W, M A Camb M D Edin, M R C P E cian, East Fife group of hospitals

CORRIGAN MAURICE, M B, B.SC N U I consultant hospitals in Dewsbury Batley, and Mirfield hospital ment committee group

DRUMMOND WILLIAM, M B E, M B Edin, F R C S E Fife group of hospitals

DUNDAS, JOSEPH, M D N U I M R C P I D P M psychiatrist Menston Hospital, Leeds

FISHER R F W M B Belf, D P H, D I H, chief Eastern Area Gas Board

FLAVELL, GEOFFREY F R C S M R C P asst surgeon department London Hospital

HAMILTON J C M, M B Edin, F R C P E senior visiting East and West Fife groups of hospitals

HENDERSON R G, M B B S C, Glasg F R C S E Falkirk and District Royal Infirmary

MACKIE J R M M D Aberd M R C P D P M consultant, trist, Menston Hospital Leeds

MILLER H. J B M B B.SC Glasg D P M consultant psy De la Pole (Mental) Hospital Willerby

PULLAN J M, M A M CHIR Camb, F R C S consultant St Thomas's Hospital London

RICHARDSON H J L R C P E., D.A consultant anæs Peterborough area

WATSON, W N B, M B Edin chief executive school Edinburgh

Colonial Service

ALLAN A M M B Edin M O Tanganyika

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LAYCOCK H T, M A M B Camb, F R C S M O, Tanganyika

SWEENEY T K M B N U I M O Tanganyika

TAYLOR JAMES, M B Glasg, D T M & H, D P H senior Seychelles

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PONSE TO ADRENOCORTICOTROPIC HORMONE AND CORTISONE*

PERSONS WITH CARCINOMA, LEUKÆMIA, AND LYMPHOSARCOMA

TOM D SPIES
M.D Harvard
) OF DEPARTMENT OF NUTRITION AND METABOLISM
ETHWESTERN UNIVERSITY MEDICAL SCHOOL, CHICAGO
DIRECTOR, NUTRITION CLINIC HILLMAN HOSPITAL,
BIRMINGHAM, ALABAMA

ROBERT E STONE
M.D Harvard
LAYTON FOUNDATION FELLOW, ASSOCIATE DIRECTOR,
NUTRITION CLINIC, HILLMAN HOSPITAL

LLERMO GARCIA LOPEZ — M.D Havana
FERNANDO MILANES — M D Havana
ASSOCIATE PROFESSORS OF GENERAL PATHOLOGY

RUBEN LOPEZ TOCA — M.D Havana
ALFREDO REBOREDO — M D Havana
INSTRUCTORS IN GENERAL PATHOLOGY
UNIVERSITY OF HAVANA

AT the present time there are no positive medicinal es for carcinoma, leukæmia, or lymphosarcoma ny promising agents are being studied, such as rogen mustard, the so-called folic-acid antagonists, l radioactive compounds, but none of these can be led true cures, because they are not based on a ersal of the underlying chemical disturbance In any instances the body has to cope simultaneously with disease and with the remedy Without getting into discussion of such agents as surgery, X rays, and hum, which may give relief by cellular destruction of tumour, we believe that for the eventual control of cer it is more important to make every effort to develop positive chemical understanding of the disease To us, s is the crux of the matter An intelligent scientific proach would seem to require the concerted action chemists to study the blood and other tissues of affected person before, during, and after specific perimental procedures

We (Spies et al. 1949, 1950) and others (Pearson et al. 49, Farber et al. 1949, Taylor and Morris 1949) have ministered either pituitary adrenocorticotropic hor- ne (A C T.H.) or synthetic 'Cortisone' acetate to ected persons with these diseases The effects of the substances are unpredictable, and they offer no cure these conditions in the immediate future Under tain circumstances, however, the symptoms have been much ameliorated that it seems desirable to make t report

ur patients were selected after careful histopatho cal examinations Of the three patients with carci na two had had surgical procedures and X-ray therapy could not be benefited further, while the third had sed to have the carcinoma of his lip excised. All excruciating pain and were incapacitated Final ema were that the primary site of the lesion must be ble to the unaided eye, that the patients must be perative, and that they should agree to have biopsies le whenever necessary The five patients with leu kæmia were selected arbitrarily after determining that they had acute leukæmia and that they had to have at least three blood transfusions weekly, four of them had lymphatic leukæmia and one had myelogenous leukæmia The two patients with lymphosarcoma were selected because they had great pain, were unable to work, and wanted to coöperate in our studies

Observations

CARCINOMA

Of the patients with carcinoma two were treated with synthetic cortisone acetate and one with pituitary A C T H In the two patients who received cortisone the condition was worse, and the improvement less than in the patient given A C T H. In both of them the involved tissues of the tongue, mouth, and regional lymph-nodes were matted into a hard firm mass which protruded several centimetres Each patient was given a total of 3 g of cortisone in divided doses of 150 mg daily intramuscularly Following this therapy they had a striking increase in sense of well being and appetite the amount of narcotics used could be reduced to about one tenth of what was previously necessary, and the patients became interested in carrying on a normal life But histological examination showed no change in the neoplasms which were composed of large anaplastic epithelial cells of squamous type, with hyperchromatic nuclei, numerous mitotic figures, and involvement of the stroma Despite the large amount of cortisone administered, neither patient developed any evidence of water or salt retention, and when the injections were discontinued there was no diuresis or loss of body weight

The following is an account of the response of the patient given A C T.H

A white man, aged 60, complained of swelling and pain of the right side of the lower lip It had begun nine months previously and had grown progressively worse, but he had refused operation The lesion, which was hard and sensitive, was a large ulcerated area covered with greyish white exudate, the crater was about 1 cm across and its edge was slightly elevated The entire area of involvement was rounded and about the size of a walnut He was unable to spit and he drooled continuously His false teeth had been broken for five years, and the break was exactly opposite the central portion of the crater of the tumour (To evaluate the effectiveness of therapy, the dentures were not changed during our studies) The lymph glands on the right side of the neck were firm and enlarged the largest being about 1 cm long, they were not tender The tongue and buccal mucosa membrane appeared normal

A biopsy specimen was described as follows "Tumour masses growing in cords and strands almost completely replace the dermal surfaces These tumour masses tend to keratinise at their centres There is marked inflammatory infiltration around the tumour strands Diagnosis squamous-cell carcinoma of the lip, grade II. The blood levels were within normal range The pulse, temperature and respiration were normal and the blood pressure ranged from 122/80 to 130/80 mm Hg

The patient was given a total of 270 mg of A C T H in five days, administered in 15 mg doses six hourly Twelve hours after the first injection the size of the lesion had noticeably decreased and it was considerably less sensitive He volunteered that he had more energy than for several months and for the first time in many weeks had a desire for food Next day the lesion was still smaller and there was less exudate from the crater It was not painful and he could move his lip with ease and without pain though it was still sensitive to touch Therapy was discontinued after five days because no more A.C T.H was available During therapy the blood pressure increased slightly, ranging from 144/74 to 150/82 after therapy was discontinued, it returned to the initial level The blood values remained within normal range

The report on a second biopsy specimen was 'Section through the specimen shows a thin margin of relatively normal-appearing squamous epithelium In the central portion there is an interruption with downgrowth of broad sheets of squamous epithelium. These show some variation in

rthwestern University studies in nutrition at the Hillman Hospital, Birmingham Alabama, and at the General Calixto Garcia Hospital, Havana, Cuba

The A C T H used in this study was furnished through the courtesy of Dr John R Mote the Armour Laboratories, Chicago Illinois, the cortisone acetate was furnished through the courtesy of Dr James M. Carlisle Merck and Company Inc Rahway New Jersey

The study was aided by grants from Hoffman La Roche Inc Nutley New Jersey and Fundacion de Investigaciones Medicas Havana Cuba and in part by a grant from the Clayton Foundation

L E Garrett Angela M Geere R E Gibson A L A Gill S C Gomez John Gower B P Green, J L Griffiths Richard Hart, R F Harvey C McL Hewat Roy Hill Ronald Hinchcliffe E R Huehns, Anne Isaac, Geoffrey Jessup P E E Kann, F M Kinsman S F Knipe S S Lazarus David Lennie H E Lewis J A F Lord I W McCloy R F McKnight, Sheina A Maclean M K Mason Jennie C Maurice Jones Wah Chaan Mok, R D Morbey, Ann E Morgan A H Mortimer G M Murphy Roy Nevendra Nauth Misir Theophilus Oladipo Olufemi Ogunlesi D W Orton E M. Orton, Kathleen M Parker J W Parkin J A Pedler L H Pell J E H Pendower Joan K Perkins D A Plomer, A J Redenham G D Rees Alison M Richardson E H Roffey I M Rosen N L Rowe K E K Rowson Hilary G Rubin P W Ruggles P S B Russell, M R Salkind, Gwendoline D Salter D I Segall Hyman Silver P R Stevens Eric Stokoe D T I Stuttaford G C Swain, D R Sweetnam Gwendolyn R Tapp I O Taylor W C T Thomas G W Thorpe J G Turner, W J A H Turner, J M Walker H B G Webb J A Williams, K G Williams, R I J Williams Donald Wiseman

The following diplomas were conferred conjointly with the Royal College of Surgeons

D A—R C Allison W E Arnold D A N Barran J K Black H R Blades S O Bramwell C P Brown D H P Cope Sheila A Costello A S Crawford, Celia M Davies P S Dearden J W Dundee D A Forbes Marion G Foster F N Gabali Rashbehari Ghose C M. H Gunaratne W S Hart, E H Hopkinson, R A House, Evelyn M Lafferty R E Lee Mair Llewelyn N G Marshall Donald Matheson, C J J Morkane T P Murray Barbara M Parker Cynthia M Parrott Khondker Abu Sayeed Mohammed Abdul Quader, D E G Sayers M W Smecton A E Smith D I H Smith, W J Tyson A B Ward

D L O—Nazir Ahmad Mohamed Amjad Ali, C R Black A C Camm A R Curtis H A Fraser, D S Gideon B S Hillar, H M. Mann Goli Subbarao Ramachandran, Vaitialingam Rasanayagam Mahammad Shawaf M S Strong

D P H—N J Caldwell, M J Collins R E C Copithorne Audrey T Evans K C Mackenzie, Noel Newman James O Callaghan, Richard O Farrell

D P M—M W Annear A L Galea M M Glatt E L Ives S F Lindsay S J Rydlewski A R Samuel J E G Vincenzi J H S Whyte, G M Woddis

D C H—Edith J R Parfit Kandukur Prabhakar

D M R D—Violet Auld E A Beetles H S Bennett N N Blaxland D J Chapman Hyman Clain, Denis Cockcroft W J J Czyzewski I O Faiman Subrata Ghose D T Glass G L Hardman, R T Hastings James Vernon Hay Bolton, R M. Hector K E Hodge, F H Howarth D C Light, M J Lochrin J K. McCabe, R P C MacDonald E V M Medill I R Moyle A H R Muir, J J O Connell, Sachchida Nand Prasad L L Ralph J A Rankin, D F Reynolds, K A. Rowley M G Scott Debabrata Sircar W H Smith R F Stubbs, G J MacA Teunon, T F Thomas, W R R Thursfield E A Waldron, D A H Walton, H B L Williams A R C Young

D M R T—James Ackerley Frank Batley F M Benton L G Capra Prasanta Kamal Dutt, A J H Henning Dorothy M. E McGuire Ian McHattie Prabhat Kumar Mookherjee Dorothy J D Smith J E Stapleton

D T M & H—Sanatkumar Hiralal Shah

D O—Mohammad Alimuddin H L Backhouse R H Baird, Jagdish Charan Bass Fiona M. Bennett, W G C Craigen Rajendra Pal Dhanda D B Dunlop Roy Ebenezer R F Elliott, Nora M English Bagir Ibrahim B U Killen Ella I Mackinnon, Satya Prakash Prabhat Kumar Rai Chaudhuri Arumbalkam Visvanatha Rajagopal J P Robinson, Tilak Raj Sakhuja J H Scott Kuei Yu Sun R St H Warren

D O M & S—P H Ball Ratan Noshirwan Bulsara R B W A Cole Prakash Chandra Ghosh, Margaret M. Harley, M. C Head Anna J Kesson, J M. McKeogh, R A Morris D J O Connor J L J Phillips, Denis Plum T F Roche, Farhan Saif L F Samut A G Shanks J R C Spicer, H S Sweet D S Thomson L M Weerekoon

Edinburgh Post-Graduate Board for Medicine

On Tuesday, Aug 8, at 3 30 P.M, Prof Homer Smith, director of the department of physiology at the New York University and Bellevue medical centre will deliver a lecture in the anatomy lecture theatre of Edinburgh University He is to speak on the Development of Modern Renal Physiology

Congress of Internal Medicine

The first International Congress of Internal Medicine will be held in Paris from Sept 10 to 14, under the presidency of Prof André Lemierre Further information may be had from Prof L Justin Besançon, 38, rue Barbet-de-Jouy, Paris VII.

The Heart Televised

Last Monday Dr J L D Silva professor of physiology at the London Hospital Medical College, and Dr John McMichael, professor of medicine at the Postgraduate Medical School of London took part in a television programme on how the heart works, how it can go wrong, and how heart-diseases are treated Patients a pregnant woman, medical students and animated diagrams were used to explain and demonstrate the various points, the heart sounds being recorded and amplified by an apparatus designed by Dr Bernstein. The programme was the eighth in the "Matters of Life and Death" series It was arranged by Dr Brian Stanford and was produced by Andrew Miller-Jones Future programmes will deal with the anæmias and tonsillectomy

Appointments

BODEN G W B SC Lond, M R.C.P, F.F R, D.M.R. London Hospital

BUCHANAN, J W M.A Camb M D Edin, M.R C.P.E [illegible] cian East Fife group of hospitals

CORRIDAN, MAURICE M B B.SC. N U.I consultant [illegible] hospitals in Dewsbury Batley and Mirfield hosp[illegible] ment committee group

DRUMMOND WILLIAM M B E, M B Edin, F R.C.S.E [illegible] Fife group of hospitals

DUNDAS, JOSEPH, M D N U I M R C P I, D.P.M. psychiatrist Menston Hospital Leeds

FISHER R E W M B Belf, D P H, D I.H chief [illegible] Eastern Area Gas Board

FLAVELL GEOFFREY, F R C.S M R C.P asst surgeon [illegible] department London Hospital

HAMILTON J G M M B Edin F R C.P F senior visit[illegible] East and West Fife groups of hospitals

HENDERSON, R G M B B.SC, Glasg F R C.S.E. [illegible] Falkirk and District Royal Infirmary

MACKIE J R M. M D Aberd M R.C.P D P.M consultant, trist Menston Hospital, Leeds

MILLER H J B M B B.SC. Glasg D P.M consultant psych[illegible] De la Pole (Mental) Hospital Willerby

PULLAN J M, M A M CHIR Camb, F.R C.S consultant [illegible] St Thomas s Hospital London

RICHARDSON H J L.R.C.P.E D.A consultant [illegible] Peterborough area

WATSON W N B, M B Edin chief executive [illegible] Edinburgh

Colonial Service

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GORDON C G I M B Edin M O Tanganyika

LAYCOCK, H T M A, M B Camb F R C.S M O, Tan[illegible]

SWEENEY T K, M B N U I M O Tanganyika

TAYLOR JAMES M.B Glasg, D T.M & H., D.P H [illegible] Seychelles

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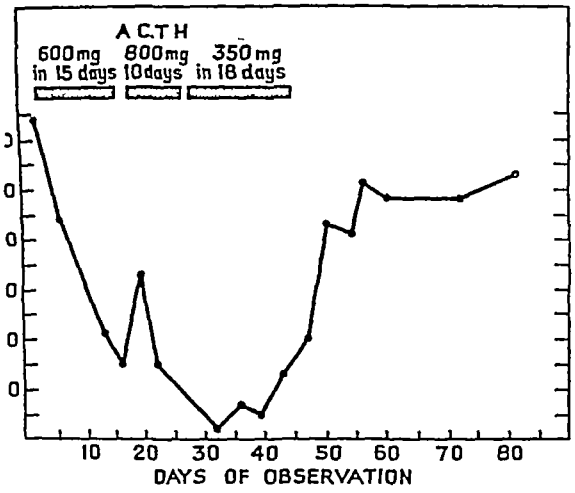


2—Effect of A.C.T H on the erythrocyte-sedimentation rate in a case of acute leukæmia.

ch had been 38 2°C on admission, fell to 36°C on the second of therapy and did not rise above 36 4°C while he was eiving the injections The pulse rate, which was 80 at the nning of therapy, ranged between 128 and 140 throughout rapy The average respiration rate was 18 before, during, d after therapy Before therapy the blood pressure was '50 by the eleventh day it had increased to 120/60, and the fourteenth day it was 130/60 His body weight, which s 36 lb at the beginning of therapy, increased to 40 1/2 lb, t he did not develop any clinical œdema and had no diuresis er the A C T H was discontinued On the second day of erapy he got out of bed played around the ward, and was erested in everything going on From that day he ate all e food on his trays, improved steadily in strength and gour, and was as active as a normal child

Twenty four hours after the injections of A C T H were scontinued he was weak, bleeding, crying, and obviously apsing Next day a smear of the peripheral blood showed lymorphonuclear leucocytes 28%, band cells 1% eosino ils 1%, lymphocytes 65%, myelocytes 1%, and lympho asts 4% After forty-eight hours without injections of C T.H. he was started on 80 mg intramuscularly in doses of mg every six hours On the second day there was a striking nical improvement He began eating well and playing again the ninth day all the examining physicians concurred at he now had a so-called "moon face" (compare fig 3 th fig 4) By this time his body weight was 6 lb greater an at the beginning of therapy but he had no pitting œdema the ankles His condition was such that the only hope as to continue the A.C T H injections, so a daily dosage level 80 mg was continued for ten days Then it was reduced to e following total amounts daily, injected in divided amounts ery six hours 40 mg for one day, 30 mg for five days, mg for one day, 15 mg for three days, and 12 mg for ht days Before the reduction in dose the blood-counts re red cells 5 12 million, white cells 9300, hæmoglobin 2 g (86%), and reticulocytes 0 4% A smear of the pheral blood showed polymorphonuclear leucocytes % band cells 4% basophils 1%, eosinophils 3%, and phocytes 21% The platelet count was 656,700 The mentation rate with correction was 5 mm. per hour (see 2) The bone marrow showed a striking change toward mal but there were some abnormal collections of white elements

C T.H injections were discontinued after he had a total 1750 mg in forty three days By this time the moon face more pronounced and his body weight, which was 36 lb ore therapy, had increased to 45 lb At this time he devel d some acne limited to a small area on the chin. In the weeks that elapsed after A.C T H therapy was discon ued the red-cell count, white cell count and hæmoglobin amed essentially unchanged. The day after therapy was ontinued the differential count showed polymorpho ear leucocytes 31% metamyelocytes 1%, basophils 1%, lymphocytes 67% In the next four weeks the sedimenta rate with correction, varied between 30 and 51 mm. per (see fig 2) The moon face and the acne persisted, his y weight increased to 50 lb (no evidence of water or sodium retention) He felt well and had a good appetite until the twenty ninth day after therapy was discontinued Then he suddenly relapsed His temperature was 39 5°C, his pulse and respiration rates were rapid Many immature cells were in his peripheral blood and he began bleeding from the gum margins At the time of relapse the blood counts were red cells 4 64 million, white cells 19,500, hæmoglobin 12 4 g (81%), and reticulocytes 0 2% A differential count showed polymorphonuclear leucocytes 20%, metamyelocytes 4%, band cells 8%, and lymphocytes 68% The sedimentation rate corrected was 52 mm per hour

A C T H in divided doses was started again At the present time, after nine days of therapy, his response is similar to that seen in the two previous periods of therapy

LYMPHOSARCOMA

The two patients with lymphosarcoma responded promptly and similarly to synthetic cortisone acetate Both had a great gain in strength, and a desire to eat and to work, and in both the symptoms disappeared One remained essentially free of symptoms for about three weeks and the other for about six weeks before the relapse occurred The following case history is representative

A man of 59, with typical lymphosarcoma, was carried to the hospital complaining of weakness, "fever," generalised itching, pain in his abdomen, and "swollen glands" in his neck

Two years before admission he had suddenly developed acute abdominal pain which rapidly became more and more severe A physician had given him medicine which relieved

Fig 3—Patient before intensive treatment with A.C.T H

Fig 4—Patient after treatment. Note development of round face.

it within a few hours A few weeks later he had noticed enlargement of the glands in his neck. Because of weakness, frequent pains in the back and abdomen, and (every three or four weeks) periods of "chills and fever" in the late afternoon and evening he had been unable to work since the onset of his illness Early in its course he had lost his appetite and since then he had eaten little His body weight had decreased by 29 lb in the two years

He appeared profoundly ill and was unable to walk There were enlarged lymph nodes on both sides of the neck and tumour masses were felt in the umbilical region the left iliac fossa, and the right side of the abdomen Biopsy of the nodes showed typical lymphosarcoma

The initial peripheral blood findings were red cells 4 12 million white cells 8500, hæmoglobin 8 6 g (56%), and reticulocytes 0 The differential count showed polymorphonuclear leucocytes 60%, basophils 1%, eosinophils 14% lymphocytes 13%, and myelocytes 12% The erythrocyte sedimentation rate, with correction, was 49 mm per hour

He was given 300 mg of cortisone intramuscularly daily for three days and then 150 mg daily for fourteen days On the third day of therapy he felt considerably better the itching of the skin was less and his strength greater On the sixth day he began walking around the ward His strength increased and the abdominal pain decreased daily Slight œdema of the face developed on the tenth day, and next day there was moderate œdema of the feet and ankles By this time he weighed 11 lb more than at the beginning of therapy and the twenty four hour output of urine had decreased from 2000–2300 ml to 1000–1200 ml

nuclear size occasional mitotic figures In an occasional area there is keratohyalin production with formation of small pearls Around the invading squamous epithelial cells there is some chronic inflammation Diagnosis squamous cell carcinoma grade II" (see fig 1)

Four months after A C T.H therapy was discontinued the lesion measured 12 × 7 mm Though still sensitive to touch, it was not painful otherwise At this time he was given a second series of injections of A C T H until he had received 576 mg during twenty four days, administered intramuscularly in 8 mg doses eight hourly On the second day there was a suggestion of less thickness of the lesion Gradually it became smaller and less firm By the eleventh day the patient was certain that the lesion was only half the size it had been at the beginning of treatment and he said that his lip felt normal, the ulcerated area had decreased to the size of a pinhead By the twentieth day all pain and soreness had disappeared At this time he went back to work for the first time in over a year On the sixteenth day of therapy he had developed slight œdema of the feet and ankles which disappeared the following day The blood pressure before therapy ranged from 108/70 to 118/74, and during therapy from 136/70 to 136/76, after the A C T H was discontinued, it returned to the initial level The blood levels, temperature, and pulse and respiration rates remained normal throughout

The biopsy report after treatment was "Section through the specimen shows a margin of normal appearing squamous epithelium This is interrupted along one edge by the down growth of masses of squamous epithelium These are very adult, are producing keratohyalin, and forming pearls They extend down to the lower margin of the biopsy specimen There is some acute and chronic inflammation associated with the lesion. Diagnosis squamous cell carcinoma of the lip, grade II, acute and chronic inflammation"

Though A.C T.H therapy was discontinued six months ago, the patient insists, and correctly, that the lesion is still decreasing in size He has been advised repeatedly to have it excised, but so far he has refused to do so

LEUKÆMIA

The results of administration of pituitary A C T.H to the five patients with leukæmia were extremely variable One patient died on the fourth day without being benefited in any way which we could determine The patient with the myelogenous leukæmia had a great clinical and moderate hæmatological response but developed hallucinations after 2500 mg of A C T H had been given in twenty five days By that time her bone marrow, which before therapy had been almost replaced by leukæmic cells, was about one-half normal element and one half leukæmic When she [illegible] hallucinations treatment was discontinued and disappeared within twenty four hours A C T.H was resumed after a three day interval at the dosage level of 25 mg four times a day, and hallucinations reappeared within forty-eight hours From that on, it was impossible to give her 100 mg of A.C.T.H in twenty four hours without the recurrence of hallucinations Hence it was a losing fight and she died within the third month of her illness The red blood-cells and hæmoglobin increased somewhat till the time of her death

The other three patients with leukæmia are living One of them, under observation for a year, has had two series of A C T H injections, each lasting fourteen days at a dosage level of 100 mg in twenty four hours No untoward symptoms developed, the enlarged lymph nodes in the neck and axillæ decreased in size, and the bone marrow became much more normal in appearance though it still contained some abnormal cells Four months after the first period of A C T H therapy symptoms recurred and she was treated again similar results Now, six months after the last series of injections, another relapse seems imminent The fourth patient had rheumatoid arthritis as well as leukæmia and was given 40 mg of A C T H. four times a day for ten days Within three days of the first injection the symptoms of arthritis decreased and the bone marrow appeared somewhat more normal. His reticulocytes rose rapidly during the next week, and the red-cell count and the hæmoglobin content of the blood increased to within normal limits within three weeks, whereas before treatment it had been necessary to give him three transfusions a week At the present time transfusions are unnecessary We see him frequently, for we suspect that he will relapse rather promptly because of the many abnormal young cells in the peripheral blood and in the bone-marrow

The fifth case requires a more detailed report.

A boy, aged 7 years, was admitted to the hospital with acute leukæmia He had suddenly become ill three previously, acute lymphatic leukæmia had been diagnosed and he had had three or four transfusions weekly When admitted, he was bleeding profusely from nose and gums and was semicomatose, refusing food and water when aroused

The initial peripheral blood findings in the hospital were red blood cells 2 55 million, white blood-cells 6350, hæmoglobin 8 4 g per 100 ml (54%), and reticulocytes 0 6% Later study of the blood smear 23% of the white cells were as belonging to the polymorphonuclear leucocyte series and 54% as belonging to the lymphoid series, the remaining cells were so immature that they could not be classified The blood platelet count was 50,820 The sedimentation-rate with correction, was 64 mm per hour Sternal punctures were made repeatedly and marrow was obtained with difficulty each time Microscopic examination showed no areas of normal bone marrow and many areas characterised by clusters of white cells of various ages, sizes, and shapes Nearly all were immature, some were recognised as belonging of the lymphoblastic series A few tiny areas of [illegible] elements were seen

As soon as the baseline observations were completed, the patient was given A C T H (Armour Standard) intramuscularly in sterile physiological solution of sodium chloride, in doses of 10 mg every six hours This therapy was continued each day for fifteen days during which time he had no transfusions On the third day the bleeding ceased, and the reticulocyte-count was 6 4% The reticulocytes peaked at 18% on the [illegible] day, and at the end of the fifteen days the blood-counts were red cells 3 38 million, white cells 5350, hæmoglobin [illegible] (59%), and reticulocytes 5 0% A smear of the peripheral blood showed polymorphonuclear leucocytes 74%, lymphocytes 25%, and one unclassified cell The platelet count 122 000 Sternal puncture showed a striking change in the bone marrow many normal areas of blood regeneration apparent though clusters of abnormal white-cell proliferation (leukæmia) were also found The sedimentation rate, correction, was 15 mm per hour (see fig 2) The [illegible]

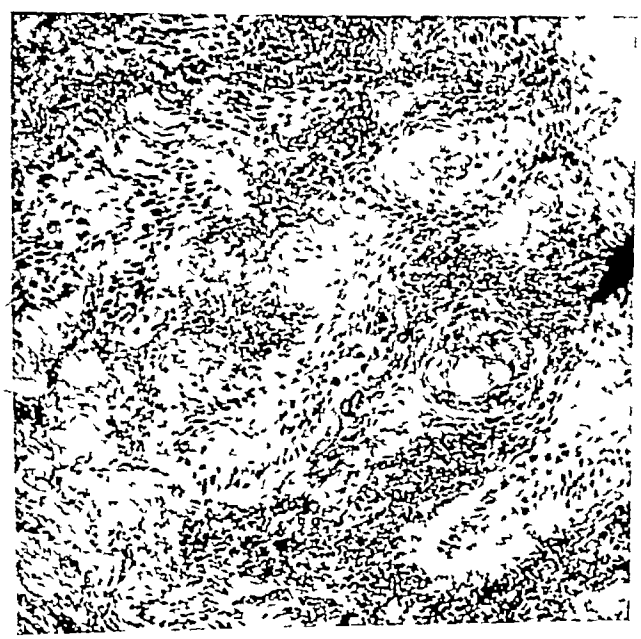
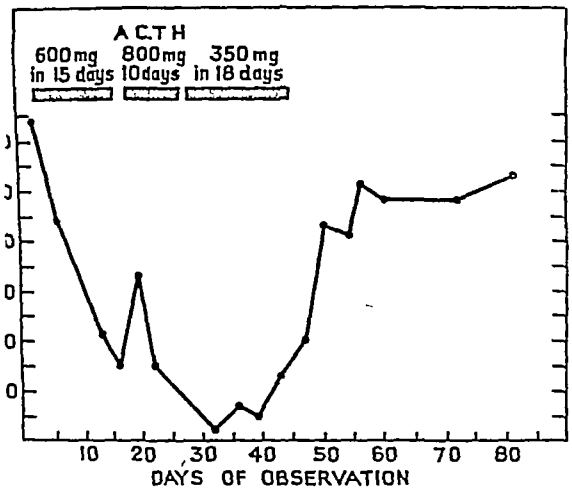


Fig 1—Squamous-cell carcinoma grade II.



2—Effect of A.C.T.H on the erythrocyte-sedimentation rate in a case of acute leukæmia.

had been 38 2°C on admission, fell to 36°C on the second of therapy and did not rise above 36 4°C while he was ving the injections The pulse rate, which was 80 at the ming of therapy, ranged between 128 and 140 throughout apy The average respiration rate was 18 before, during, after therapy Before therapy the blood pressure was), by the eleventh day it had increased to 120/60, and e fourteenth day it was 130/60 His body weight, which 36 lb at the beginning of therapy, increased to 40 1/2 lb, e did not develop any clinical œdema and had no diuresis the A.C.T.H was discontinued On the second day of apy he got out of bed, played around the ward, and was ested in everything going on From that day he ate all food on his trays, improved steadily in strength and ur, and was as active as a normal child

wenty four hours after the injections of A C T H were ontinued he was weak, bleeding, crying, and obviously sing Next day a smear of the peripheral blood showed morphonuclear leucocytes 28%, band cells 1% eosino 1%, lymphocytes 65%, myelocytes 1%, and lympho ts 4% After forty-eight hours without injections of T.H he was started on 80 mg intramuscularly in doses of ng every six hours On the second day there was a striking ical improvement He began eating well and playing again the ninth day all the examining physicians concurred t he now had a so-called "moon face" (compare fig 3 fig 4) By this time his body weight was 6 lb greater n at the beginning of therapy but he had no pitting œdema the ankles His condition was such that the only hope to continue the A C T.H injections, so a daily dosage level 0 mg was continued for ten days Then it was reduced to following total amounts daily, injected in divided amounts ry six hours 40 mg for one day, 30 mg for five days, mg for one day, 15 mg for three days, and 12 mg for nt days Before the reduction in dose the blood counts e red cells 5 12 million white cells 9300, hæmoglobin 2 g (86%), and reticulocytes 0 4% A smear of the ripheral blood showed polymorphonuclear leucocytes %, band cells 4% basophils 1%, eosinophils 3%, and iphocytes 21% The platelet count was 656,700 The imentation rate with correction was 5 mm per hour (see 2) The bone marrow showed a striking change toward mal but there were some abnormal collections of white elements

-C T H injections were discontinued after he had a total 750 mg in forty three days By this time the moon face more pronounced and his body weight, which was 36 lb ore therapy had increased to 45 lb At this time he devel d some acne limited to a small area on the chin. In the weeks that elapsed after A C T H therapy was discon ed the red-cell count white-cell count, and hæmoglobin ained essentially unchanged The day after therapy was ontinued the differential count showed polymorpho ear leucocytes 31%, metamyelocytes 1%, basophils 1%, lymphocytes 67% In the next four weeks the sedimenta rate, with correction varied between 30 and 51 mm per (see fig 2) The moon face and the acne persisted, his weight increased to 50 lb (no evidence of water or sodium retention) He felt well and had a good appetite until the twenty ninth day after therapy was discontinued Then he suddenly relapsed His temperature was 39 5°C, his pulse and respiration rates were rapid Many immature cells were in his peripheral blood and he began bleeding from the gum margins At the time of relapse the blood counts were red cells 4 64 million, white cells 19,500, hæmoglobin 12 4 g (81%), and reticulocytes 0 2% A differential count showed polymorphonuclear leucocytes 20%, metamyelocytes 4%, band cells 8%, and lymphocytes 68% The sedimentation rate corrected was 52 mm per hour

A C T H in divided doses was started again At the present time, after nine days of therapy, his response is similar to that seen in the two previous periods of therapy

LYMPHOSARCOMA

The two patients with lymphosarcoma responded promptly and similarly to synthetic cortisone acetate Both had a great gain in strength, and a desire to eat and to work, and in both the symptoms disappeared One remained essentially free of symptoms for about three weeks and the other for about six weeks before the relapse occurred The following case history is representative

A man of 59, with typical lymphosarcoma, was carried to the hospital complaining of weakness, "fever," generalised itching, pain in his abdomen, and "swollen glands" in his neck

Two years before admission he had suddenly developed acute abdominal pain which rapidly became more and more severe A physician had given him medicine which relieved

Fig 3—Patient before intensive treatment with A C T H

Fig 4—Patient after treatment. Note development of round face.

it within a few hours A few weeks later he had noticed enlargement of the glands in his neck. Because of weakness, frequent pains in the back and abdomen, and (every three or four weeks) periods of "chills and fever" in the late afternoon and evening he had been unable to work since the onset of his illness Early in its course he had lost his appetite and since then he had eaten little His body weight had decreased by 29 lb in the two years

He appeared profoundly ill and was unable to walk There were enlarged lymph nodes on both sides of the neck, and tumour masses were felt in the umbilical region the left iliac fossa, and the right side of the abdomen Biopsy of the nodes showed typical lymphosarcoma

The initial peripheral blood findings were red cells 4 12 million white cells 8500 hæmoglobin 8 6 g (56%), and reticulocytes 0 The differential count showed polymorphonuclear leucocytes 60%, basophils 1%, eosinophils 14%, lymphocytes 13%, and myelocytes 12% The erythrocyte sedimentation rate, with correction was 49 mm per hour

He was given 300 mg of cortisone intramuscularly daily for three days and then 150 mg daily for fourteen days On the third day of therapy he felt considerably better the itching of the skin was less and his strength greater On the sixth day he began walking around the ward His strength increased and the abdominal pain decreased daily Slight œdema of the face developed on the tenth day, and next day there was moderate œdema of the feet and ankles By this time he weighed 11 lb more than at the beginning of therapy and the twenty four hour output of urine had decreased from 2000–2300 ml to 1000–1200 ml

At the end of therapy the peripheral blood findings were red cells 5 18 million, white cells 15,950 hæmoglobin 10 8 g (70%), and reticulocytes 0 The differential count showed polymorphonuclear leucocytes 79%, metamyelocytes 1%, band cells 3%, lymphocytes 12%, and myelocytes 5% The sedimentation rate, with correction, was 18 mm per hour On the fifth day of therapy the eosinophils disappeared from the circulating blood and they did not reappear until seven days after therapy was discontinued At this time the white cell count was 8950 and the eosinophils 3% Seven days after therapy was discontinued the white cell count was 9600 and the eosinophils 5%

Throughout the period of study the temperature varied between 36 0° and 37 9°C, the pulse rate between 88 and 120, and the respiration rate between 18 and 24 The blood pressure, which before therapy was 130/80, increased to 180/90 on the ninth day and varied between this level and 170/80 until injections of cortisone were discontinued In the week after this it returned to the initial level

Two days after the cortisone injections ceased the clinical evidence of the œdema disappeared, and nine days later the patient's weight was the same as before therapy The lymph node enlargement in the neck decreased by at least 75% during the administration of cortisone and the swelling continued to subside for some time after it was discontinued, but biopsy showed that characteristic lymphosarcoma was still present Eighteen days after therapy was discontinued the generalised itching of the skin reappeared and the abdominal pain returned After forty five days without therapy the blood values were red cells 4 50 million, white cells 11,500, hæmoglobin 10 5 g (68%), and reticulocytes 0 The differential count was polymorphonuclear leucocytes 71%, band cells 3%, eosinophils 4%, and lymphocytes 22% The sedimentation rate with correction was 58 mm per hour

By this time the patient was having very severe abdominal pain and was so weak that he was unable to get out of bed Accordingly it was decided to give him another series of injections He was given 300 mg of synthetic cortisone acetate intramuscularly the first day and 150 mg on each of the following thirteen days Within six hours of the first injection he began to feel better and to have less pain The pain continued to subside and it disappeared by the eighth day The nodes under his arm had then decreased in size At the present time, ten days after therapy was discontinued, he is still free of pain

On the last day of therapy the red cell count was 5 07 million, the white-cell count was 18,750, the hæmoglobin was 11 3 g (73%), and the reticulocytes were 1 2% The differential count was polymorphonuclear leucocytes 75%, metamyelocytes 1%, band cells 2%, eosinophils 1%, lymphocytes 18%, myelocytes 1%, and monocytes 2% The sedimentation rate with correction was 32 mm per hour The blood pressure before therapy was 120 to 130/70, on the eleventh day it increased to 170/100 and it gradually returned to the initial level after treatment was discontinued

He has obtained light work and claims that he is able to do it without difficulty

Summary and Conclusions

Three patients with inoperable squamous cell carcinoma, five with acute leukæmia, and two with lymphosarcoma were given either pituitary A C T.H or synthetic cortisone acetate In nine of the ten cases the symptoms were promptly ameliorated, the intense pain disappeared in six and decreased in three In each of these nine patients the lesions dwindled in size One patient with leukæmia died on the fourth day of treatment without having had any apparent benefit

The patient with carcinoma of the lip became entirely free of pain and was able to resume his occupation as a carpenter The other two patients, who had more extensive metastatic carcinoma, became much more cheerful and had much less pain The involved lymph-nodes decreased in size and they required much smaller amounts of narcotics for complete relief of pain In each of these cases the lesions decreased but tumour cells remained

The four patients with acute leukæmia who had some improvement responded very differently In one the improvement was definite but not great, two improved a great deal, and one improved so much that it was difficult to find evidence of pathological cells The appetite of these patients became voracious T outlook was one of mild elation, and from the di A C T H was started we did not have to give borrowed blood

In both patients with lymphosarcoma the size of involved glands decreased rapidly when cortisone given The fever disappeared and a surge of followed One of these patients remained free of symptoms for three weeks, the other for six weeks When symptoms started to return, the patients were treated again with similar results The underlying lymphosarcoma did not change as far as could be seen histopathological technique

The variability in response of patients with carcinoma leukæmia, or lymphosarcoma may be due to dose length of illness, length of treatment, or many factors But if the results are variable and unpredictable A C T H and cortisone are nevertheless promising for medical investigators in this field Certainly changes occur in the body during their administration Since we had objective evidence in each of the patients that the disease did not disappear, it seems to fit this into our working hypothesis, which is the body of the person who does not have carcinoma leukæmia, or lymphosarcoma the glands are capable of producing protective substances from materials in foods It is of the utmost importance to find out the precise nature of these materials so that we can augment the effect of the glands in making them How are we to maintain a chemical balance within the body to prevent these diseases developing? After all, they are new growths of tissue which arise from normal tissue and appear to serve no useful purpose The cause is unknown There is no lack of theories, but when one has finished discussing these, one still has not come to any conclusion What is the chemical difference between the malignant tumour and the tissue from which it arises?

What happened to the abnormal cells when A C.T.H and cortisone were administered? Was the chemical condition of the body changed so that the activity these cells was reduced? Does that not account for the decrease in size and the decrease of pain? The answer not obvious When we searched long enough scopically, we still could find neoplastic or abnormal tissue, yet it was relatively much less Why did it diminish in quantity? We could not tell from a single microscopic study whether the process was "coming or going" We could not tell microscopically whether the balance was in favour of success or failure What determines this delicate mechanism? In what way are these cells different from normal cells? What happens to a person who has hidden neoplastic cells which he lives over a period of years only to reappear in identical form after a long interval? Has not that person's body chemistry changed while those cells lie hidden in the body throughout the years? Is there a mechanism which retard the development of a latent tumour cell? Will a person with neoplastic potentialities have them throughout his life? Though the administration of A C.T.H cortisone causes neoplastic tissues to dwindle in size multitude of hidden abnormal cells still remain in tissues Will they not be called forth again as soon the chemistry is restored to its original state? Is this what might be termed a deferred carcinoma, deferred leukæmia, or deferred lymphosarcoma? Then, is not the major problem the lack of defence within the body against these cells?

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LUNG CARCINOMA IN ICELAND*

NIELS DUNGAL
M D Icelandic
PROFESSOR OF PATHOLOGY UNIVERSITY OF ICELAND

PULMONARY carcinoma has apparently been on the rise in most civilised countries during the last few decades, and the increase has been in absolute numbers as well as in relation to other growths At the beginning of this century the disease seems to have been rare, as the following reports, cited by Huguenin (1928), indicate

Author	Place	Dates	No of necropsies	Cases of lung cancer No	Cases of lung cancer % of total
[illegible]	—	—	11 400	40	0 35
[illegible]as	—	1854–1896	24 000	17	0 08
[illegible]wiski	Lemberg	1886–1903	7006	6	0 085
[illegible]rhovic	Petrograd	1905–1914	16 047	61	0 38

The average incidence in these four series is only 0 22% of all necropsies When we compare the more recent figures quoted by Fischer (1931) we see that the position has changed greatly

Budapest (% of all necropsies)		Helsingfors (% of all necropsies)		London (% of all necropsies)	
1909–23	2·67	1905–09	4 5	1923	6 76
1924–27	6 65	1910–14	6 2	1924–28	14 15
1927–28	8 1	1915–19	8 5		
		1920–24	12 9		
		1925–29	15 0		

In some places—e g , Stanford, California (Eloesser 1925)—the proportion of lung cancer has reached 20% of all carcinomas The rise in incidence seems to be continuing up to the present day, and Churchill (1948) states that in the U S A pulmonary cancer is now almost as common as cancer of the stomach

Tudor Edwards (1942) has little doubt that the increase in lung carcinoma is real, though some writers think it only apparent Peery (1940) contended that many lung cancers which were classed as metastatic when lung carcinoma was considered a rare disease were actually primary tumours Certainly some growths which were formerly looked on as extrapulmonary—e g , "endothelioma of the pleura" and "mediastinal sarcoma" or "oat-cell tumour"—are now included with pulmonary carcinomas On the other hand, extrapulmonary tumours which have disappeared from their original site after irradiation may sometimes have metastasised in the lungs and been mistaken for primary lung carcinomas Steiner (1944) and Passey and Holmes (1935) are among those who incline to the view that the increase is mainly apparent, but most authorities, including Huguenin (1928), Davidson (1930), Simons (1937), and Björk (1947), agree that there is an actual and considerable rise in the incidence

* Based on an address delivered at the centenary meeting of the Hungarian Medical Association in Budapest, 1948

TABLE I—ANALYSIS OF CASES OF PULMONARY CARCINOMA

Case No	Year	Age (yr)	Sex	Site and type of growth
1	1933	50	M	Fist size growth in left upper lobe Brain metastasis Hist bronchio-columnar
2	1933	49	M	Diffuse growth in right lower lobe enveloping heart œsophagus and pancreas Hist. oat-cell
3	1936	72	F	Bronchial carcinoma with heavy involvement of right tracheobronchial glands
4	1941	52	M	Cherry-size nodule in lung Diffuse pleural growth on left side with heavy involvement of tracheobronchial glands Hist. alveolar
5	1943	56	M	Bronchial carcinoma in right apex, enveloping subclavian artery and obliterating bronchus. Hist. oat-cell
6	1943	51	M	Diffuse growth in right lung with greatly thickened pleura Metastases in heart and vertebral bodies Hist alveolar
7	1946	64	F	Diffuse growth in left lung Patient feverish previous two months Hist columnar
8	1946	48	M	Cavernous growth in right apex, with extensive involvement of mediastinal glands Hist alveolar (Patient was heavy smoker of Virginian cigarettes)
9	1946	52	F	Nodular growth in left lower lobe with infiltration of lymphatics and diaphragm Hist. adenocarcinoma
10	1947	66	M	Diffuse growth in right lung apparently originating in bronchial mucosa severe involvement of mediastinum Hist. oat-cell
11	1948	47	M	Lower and middle lobe of right lung transformed by growth Hist adenocarcinoma
12	1948	59	M	Small bronchial carcinoma with extensive metastases in mediastinal glands Hist. bronchio-columnar

FINDINGS IN ICELAND

The material for the present study was small, but its value is enhanced by the special circumstances in Iceland, where the isolated community live in conditions that are in many respects simpler and more transparent than in other countries, so that some of the agents which have been alleged to be responsible for lung carcinoma may be more accessible for evaluation in Iceland than elsewhere

TABLE II—SITES OF CARCINOMAS FOUND IN 1939 NECROPSIES

Site	No	% of total	Sex of patients: Male	Sex of patients: Female
Stomach	119	35	82	37
Intestine and rectum	38	11	15	23
Liver	8	3	—	—
Bile-duct	6	2	—	—
Mouth and larynx	12	4	—	—
Œsophagus	21	6	17	4
Lung	12	4	9	3
Pancreas	18	5	8	10
Thyroid	4	1	—	—
Breast	21	6	0	21
Kidney	20	6	12	8
Bladder	6	2	5	1
Ovary	13	4	0	13
Uterus	26	8	0	26
Prostate	9	3	9	0
Other sites	4	1	—	—
Total	337	—	—	—

The study is based on the 1939 necropsies performed in Reykjavik from 1932 to 1948 inclusive Most of these were done by me personally, and the rest by my assistants, usually under my supervision There has consequently been a uniform approach to the subject, and the whole material has been critically reviewed for this purpose

In this period we had 12 cases of primary lung carcinoma—11 diagnosed in our protocols and 1 added during this study, having originally been diagnosed as a mediastinal sarcoma but later found to be a pulmonary carcinoma of the oat-cell type Of the 12 cases, only 3 were in females This accords with the findings in other countries, where, according to Björk (1947), the preponderance in males has been found to range from 4 5 1 to 13 5 1

The incidence of lung carcinoma in our necropsy material is 0 6% The total number of malignant growths in this series was 417, so the proportion of lung cancers is 2 9% On the basis of carcinomatous growths only, which numbered 337, the proportion is 3 5% Details of the 12 cases are summarised in table I

Table II shows the numbers of carcinomas found in different sites in our series and their sex distribution Thus, in this 17 year period, cancer of the stomach was ten times as frequent as cancer of the lung The survey indicates that in Iceland lung cancer is still a rare disease, the incidence being similar to that in many European countries at the beginning of the century

DISCUSSION

Many conjectures have been advanced to explain the increased incidence of lung cancer The inhalation of exhaust gases from motor vehicles and of vapour from

the tar products used in road making, and tobacco smoking, are most commonly blamed. The possible importance in this respect of respiratory infections, particularly influenza, has also been considered Our experience in Iceland throws some light on the significance of each of these factors

Respiratory Infections—These are highly prevalent in Iceland, especially in the winter They disappear in the summer to reappear in the autumn, when the days are growing shorter There is no doubt that bronchitis is more frequent in Iceland than in most civilised countries If carcinoma tends to arise in organs in which inflammatory changes are most frequent, one would expect bronchial carcinoma to be particularly common in Iceland But the fact that it is rare strongly suggests that there is no connection between the common respiratory infections and lung carcinoma

Influenza—The view that the influenza epidemic of 1918 might have been a factor in the high incidence of lung carcinoma can also be refuted on the same grounds, for the population of Reykjavik were among the worst sufferers from that epidemic, the disease raging with a force hardly paralleled in any other country

Tarred Roads—It is known that various tar products are carcinogenic, but it would be strange if they were much more carcinogenic for men than for women, and in all countries lung cancer shows this sex differentiation Probst (1927) pointed out that the streets of Zürich were not tarred until 1920, but that lung carcinoma had shown a definite increase before that In Reykjavik tarring of the streets also began about 1920, and since then most of the streets have been tarred If the tarring had anything to do with the increased incidence of lung carcinoma we should expect a greater rise than we have found.

Contagion from Sheep—We have in Iceland a widespread disease among sheep, characterised by adenomatous growths in the lungs, the structure in some cases resembling carcinoma Since this disease, which goes by the name of *jaagsiekte*, is definitely contagious and produces lesions that are strikingly like some forms of diffuse carcinomatous growths, the possibility of its transfer to the human population has naturally been considered In our material, however, we have never found human lungs resembling the *jaagsiekte* lungs in sheep Cases 4 and 7, and perhaps also case 5, were in a group by themselves in that the growths were of relatively short standing and appeared to have multiple centres of origin, possibly from the alveolar walls, as in *jaagsiekte*, but the patients were townspeople who had had no known contact with sheep In fact, our experience is very decidedly against there being any transfer of the sheep disease to man.

Tobacco—When I compare what I have seen of tobacco smoking in England and the U S.A with that in our country the difference is striking Up to the last few years, when cigarette smoking has increased considerably, among both men and women, the consumption of tobacco, particularly in the form of cigarettes, has certainly been much less in Iceland than in most European countries and America

TABLE III—ANNUAL RETAIL SALES OF CIGARETTES*

Year	Total cigarette consumption (million lb)							
	Iceland	Hungary	Italy	Jugo slavia	Austria	France	Czecho slovakia	U K
1913	0 002	—	7 4	—	—	8 4	—	32 3
1920	0 014	2 0	16 0	—	5 6	12 0	17 6	69 9
1925	0 029	4 3	25 5	6 3	8 8	23 4	20 9	83·4
1930	0 056	4 4	31 5	11 2	10 0	39 4	26 7	109 5
1935	0 048	4 3	28 7	10 0	9 8	36 9	—	117 5
1946	0 2	—	—	—	—	—	—	—

* From Hutson (1937)

TABLE IV—RETAIL SALES OF CIGARETTES PER HEAD POPULATION)*

Country	Per capita consumption of cigarettes (lb)				
	1913	1920	1924	19[illegible]9	[illegible]
Austria	—	0 87	1 30	1 57	[illegible]
Finland	0 92	1 34	1·47	1 [illegible]5	[illegible]
France	0 22	0 31	0 57	0 86	[illegible]
Germany	0 40	0 72	0 90	1 12	[illegible]
Hungary	—	—	0 35	0·60	[illegible]
United Kingdom	0 71	1 49	1 73	2 26	[illegible]
Iceland	0 03	0 14	0 24	0·40	[illegible]
		1940	*1945*	*1946*	[illegible]
		0 44	1 00	1 50	[illegible]

* From Hutson (1937)

Roffo (1943) has shown that pulmonary carcinoma can be produced in rats by injecting tobacco tar into their lungs, according to Roffo this product is "strongly carcinogenic," so there is a sound experimental basis for the view that smoking predisposes to lung cancer But if lung cancer is caused by inhaling a carcinogenic product of tobacco we would hardly expect the disease to start soon after the habit of smoking is acquired. *From the miners at Schneeberg, of* whom 60–70% died of lung cancer at one period, we may learn that lung cancer arising from the inhalation of a carcinogenic substance is a disease with a long period of incubation or, perhaps we should say, of preparation Most of the miners who developed lung cancer had, according to Huguenin (1928), been in the mines for about twenty five years and had reached 50 years of age, their average age being 55 If tobacco is a causal agent in lung carcinoma we might therefore expect to see it in people who have been smoking for twenty years or more, which in general would mean people over 40 years of age

If we study the consumption of tobacco in various countries since the beginning of this century, we find a universal and considerable increase in the consumption of cigarettes, whereas the smoking of cigars has either decreased or only slightly increased The consumption of snuff and chewing tobacco has decreased everywhere Table III illustrates the increase in cigarette consumption in some European countries

In England, where the incidence of lung carcinoma seems to be the highest in Europe, there is the highest consumption of cigarettes, and the annual total has increased greatly between 1913 and 193[illegible] Assuming that lung carcinoma is determined by the inhalation of tobacco smoke during the previous fifteen to twenty five years, then 1913–35 would correspond to the preparatory period of the lung carcinomas which have been making themselves increasingly apparent in the last two decades

When we compare the per head consumption of cigarettes in Iceland with that in other countries (table IV) we see that in most of Europe it increased steadily between the two world wars, whereas in Iceland the figure was relatively low until the beginning of the second world war, when it rose enormously, and is apparently still increasing rapidly Before 1926 the consumption in Iceland was under 0 24 lb per head, and in the first two decades of the century it was considerably less If we assume that twenty to twenty five years tobacco smoking is necessary to produce cancer of the lungs, we should expect a very low rate of lung cancer in Iceland until 1960–65, when the rate would rise very considerably

SUMMARY

Lung cancer is a rare disease in Iceland, being [illegible] in frequency among carcinomas of various organs according to an analysis of necropsy findings

The increased frequency of lung carcinoma in civilised countries is thought to be connected with

-ase in the consumption of cigarettes which has taken , particularly in Great Britain and the U S A -ng this century

Iceland cigarette smoking, though practised since beginning of this century, has increased at a much er rate than in other countries, and the annual umption did not reach 1 lb per head until 1945, reas in Great Britain and Finland it passed that unt before 1920

it takes twenty twenty five years to develop lung er from smoking cigarettes these differences in con ption will explain why lung cancer is still rare in and.

n the last few years the annual consumption of rettes in Iceland has reached 1 5 lb per head, and if above assumption is correct a considerable rise in the dence of lung carcinoma may be expected in 1960–65

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PROTECTION OF THE SKIN FROM SUNBURN

COMPARISON OF THE ABSORPTION SPECTRA OF SCREENING AGENTS AND THEIR EFFICACY IN ECZEMA SOLARE

BRIAN RUSSELL
M.D Lond , M.R C P , D.P.H
ASSISTANT PHYSICIAN TO THE SKIN DEPARTMENT, r BARTHOLOMEW S HOSPITAL, PHYSICIAN TO ST JOHN S HOSPITAL FOR DISEASES OF THE SKIN, LONDON

DAPHNE ANDERSON
M.B Lond , M.R C P
-INICAL ASSISTANT IN SKIN DEPARTMENTS, ROYAL FREE AND ST JOHN S HOSPITALS

In the prevention of skin disorders caused by sunlight ıd the relief of those aggravated by light it is useful · know what spectral range of light must be excluded ı most of these disorders the wave lengths concerned e shorter than 3300 Å but longer than 2900 Å which about the short wave length limit of the summer sun temperate zones *In this category fall acute and* ronic solar dermatitis, light sensitisation by sulphon-ıides and some other substances, xeroderma pigmen-ıum, and the initiation or aggravation of lupus rthematosus, herpes simplex recurrens, keratoses, and ın cancer Most cases of eczema solare of Willan and ımmer prurigo of Hutchinson, which are now often ıuped together as the "polymorphic light eruption" Haxthausen, are also caused by this "sunburn ctrum" (fig 1), though in others violet and blue rays o play a part

Urticaria solare is usually due to sensitivity to the e violet (3900–5200 Å), but cases have been reported m wave lengths shorter than 3700 Å. Window-glass ıeens all rays of wave length shorter than 3130 Å, so gives complete protection against most of the first up of disorders, but none against urticaria solare, ept the rare form in which the skin is sensitive to re lengths under 3700 Å (Beal 1948) and which may partially relieved

A patient with eczema solare, apparently due to the t within the sunburn spectrum range, has been

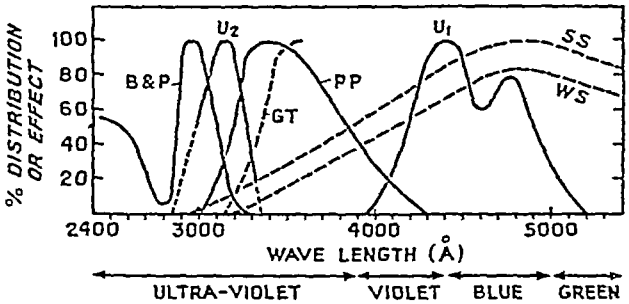


Fig 1—Action spectra of some solar dermatoses (adapted from Glasser 1944 and other sources) Ordinate units have been chosen to bring all maxima to same level
SS and WS = distribution of sunlight at noon in midsummer and midwinter
B & P = sunburn and pigmentation
PP = darkening of preformed pigmentation.
U_1 and U_2 = urticaria solare blue-violet type and <3700 Å type (Beal)
GT = lower limit of transmission by window glass.

tested with several screening agents incorporated in different bases, and the absorption spectra of various combinations of bases and chemical screens have also been determined for comparison with the clinical findings

CASE REPORT

A male civil servant, aged 58 had for 15 years suffered at intervals from intense itching of the forehead, cheeks, chin, and backs of the hands, followed by erythema and a papulo vesicular eruption The condition always began in May or June and cleared in September and the itching and eczematous reaction started 6–8 hours after exposure to sunlight For 2 years the trouble had been more widespread, affecting the back of his neck and his forearms if they were uncovered

There was no history of the application or ingestion of sulphonamides or of the application of tar or acriflavine, but in 1929 he was treated for sores in the nostrils with soap and an ointment, both of which contained mercury, and after their use a rash appeared on his face In July, 1935, he had a carbuncle which was treated with mercurial tablets by mouth This treatment was followed by swelling of his face and a rash on his face and hands which immediately preceded the onset of his recurrent summer eruption.

The patient s mother, a daughter of one of his sisters, and his niece s daughter all suffered from light sensitivity, the ages of onset being 50 years 29 years and 1 year

Condition on Examination (Sept 22, 1949)—A healthy-looking grey haired man with a patchy squamous erythema involving his forehead the backs of his hands, and to a lesser degree his nose and cheeks A diagnosis of eczema solare was made with a presumed genetic basis precipitated by sensitisation to mercury, and possibly associated with some disturbance of liver function.

Laboratory Findings—Blood Wassermann and Kahn reactions negative Mantoux reaction (1 in 10 000) positive

Total serum proteins 6 59 g per 100 ml , serum-albumin 4 39 g and serum globulin 2 2 g per 100 ml., albumin globulin ratio 2 1 02

Alkaline phosphatase 4 5 King Armstrong units Thymol turbidity test, normal (less than 1 unit) Blood urea 45 mg per 100 ml

Urine acid ether U V.R. test, negative

Fæces no porphyrins detected spectroscopically by Snapper s test.

Light Sensitivity—Exposure of the patient s forearm to a mercury vapour lamp for 1 min. at 28 inches (first-degree exposure) produced a fourth-degree erythematobullous reaction equivalent to that produced in the average subject by a similar exposure for 4 min or more The eczematous reaction, which was followed by peeling and well marked pigmentation indicated fourfold to sixfold enhancement of sensitivity to the spectrum from a mercury vapour lamp which is strong in sunburn wave lengths but weak in the longer wave lengths of sunlight It is hoped shortly, by exposing the patient s arm to light which has passed through a spectrograph to define the region of the spectrum to which his skin is susceptible The evidence so far gathered suggests that the sensitivity is to the sunburn range

Test for Passive Transfer of Sensitivity—As was expected, the Prausnitz Kuestner reaction was negative (*a*) with blood

serum and (*b*) with blister fluid The tests were carried out as follows

(*a*) *Blood* was taken from the patient, separated, and the serum pipetted off Part of this serum was inactivated by heating for an hour at 60°C A control subject was given intradermal injections of (i) 0 2 ml of the unheated serum and (ii) 0 2 ml of inactivated serum into two areas on the flexor surface of the forearm These two areas and a third area of normal skin were then irradiated with a first-degree erythema dose of ultraviolet light Into a fourth area on the forearm 0 2 ml of unheated serum was injected as before but the area was irradiated (first-degree erythema) after an interval of four days A first degree erythema developed in all four areas

(*b*) *Blister fluid* was obtained from a bulla produced on the patient by irradiation with the Kromayer lamp The procedure was then the same as with the serum The area injected with active blister fluid became irritating after six hours and the irritation persisted for twenty four hours A first-degree erythema was produced in all the areas

TESTS WITH SCREENING AGENTS

It was found that an area of skin could be completely protected against an exposure to a mercury vapour lamp sufficient to cause an erythematovesicular reaction on unprotected skin by covering it with a film about 0 1 mm thick of the following anhydrous emulsifying base "A," as used at St John's Hospital for Diseases of the Skin

Lanette wax (sx)	6 25
Liquid paraffin	6 25
Yellow soft paraffin	87 5

The screening effect of this base is probably due to the high percentage of yellow soft paraffin

Four different substances—(*a*) tannic acid 5%, (*b*) quinine hydrochloride 5%, (*c*) sodium *p* aminobenzoate 10%, and (*d*) salol 10%—were incorporated in the following five different bases

(i) Ointment of wool alcohols
(ii) Water
(iii) Yellow soft paraffin.
(iv) Hydrous base "C," containing lanette wax (sx) 3, liquid paraffin 6, water 91
(v) Anhydrous base "A" (as above)

These were applied to areas of skin in a film about 0 1 mm thick, except the watery solutions and suspensions which were painted on The areas were then exposed for 1 minute to the mercury-vapour lamp at 28 inches, an exposure previously noted to produce an erythematovesicular reaction on uncovered areas

The results can be tabulated as follows, where 0 = no reaction, 1 = slight erythema, 2 = moderate erythema with some swelling, and 3 = marked erythema with vesiculation

		i	ii	iii	iv	v
Substances	(*a*)	1	3	1	1	0
	(*b*)	1	3	1	1	0
	(*c*)	2	3	0	0	0
	(*d*)	1	3	0	1	0
Base alone		3	3	0	2	0

Bases

Conclusions—Yellow soft paraffin and an anhydrous emulsifying base containing 87 5% of yellow soft paraffin are effective screens against sunburn A hydrous emulsifying base is slightly effective and its effects are enhanced by the addition of screening substances Ointment of wool alcohols is ineffective alone but almost as effective as the hydrous base when screening agents are added Watery solutions and suspensions of screening substances are all ineffective This is not always due to their insolubility in water because tannic acid and sodium *p* aminobenzoate are very soluble Salol, on the other hand, is almost insoluble, while quinine hydro chloride is only soluble 1 part in 32 of w acid 5% and quinine 5% seemed to lessen screening properties of the yellow soft and sodium *p* aminobenzoate did not influence

ABSORPTION SPECTRA

The absorption spectra of various creams with a Hilger quartz spectrograph, the light a high voltage spark from metal electrodes exposure time 30 seconds The light was each cream in a film spread as uniformly 0 15 mm thick between two thin layers of unevenness of some bands is due to the getting an extremely thin layer free from local

Bases Alone and with Sodium p Aminobenzoate (fig. 2)

Sodium *p*-aminobenzoate was incorporated in the bases because in recent years *p* aminobenzoic acid and its esters have been widely used as sun screening agents Just as in the clinical tests, this substance was found to improve the screening properties of four out of

Fig 2—Absorption spectra of five different emulsifying bases alone and with 15% sodium p-aminobenzoate (Na P.A.B)
I and II: base C alone and with Na P.A.B
III and IV: ointment of wool alcohols alone and with Na P.A.B.
V and VI: base B" alone and with Na P.A.B.
VII and VIII: witch hazel cream alone and with Na P.A.B.
IX and X: base A' alone and with Na P.A.B

five bases, the exception being the anhydrous emulsi base "A" which was fully effective by itself in the 2900–3300 Å range

The bases were effective in the following order

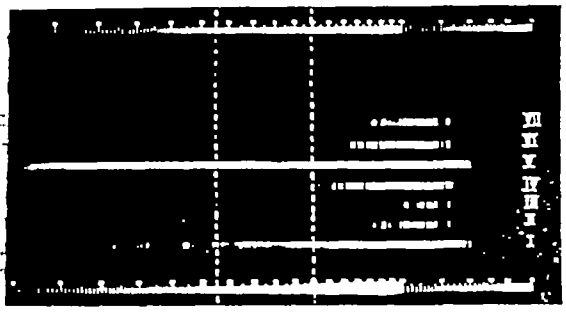
Anhydrous base "A"		Completely effective
Ointment of wool alcohols		Relatively ineffective
Witch hazel cream (*B.P C*)		Relatively ineffective
Anhydrous base "B," containing		Ineffective
lanette wax (sx)	30	Ineffective
liquid paraffin	40	Ineffective
white soft paraffin	30	Ineffective
Hydrous base "C"		Ineffective

and with sodium *p* aminobenzoate incorporated

Anhydrous base "A"	Completely effective
Witch hazel cream (*B.P C*)	Completely effective
Ointment of wool alcohols	Relatively effective
Anhydrous base "B"	Ineffective
Hydrous base "C"	Ineffective

It is clear that in a light screening cream the vehicle plays a part as important as any screening agent that may be incorporated Apart from the anhydrous base "A," which was completely effective in itself, the most successful base in conjunction with sodium *p*-aminobenzoate was pasta hamamelidis (witch hazel cream *B.P C*, a "vanishing" cream consisting of 50% solution of witch hazel in pasta acidi stearici, a non-greasy stearate cream This base has the added virtue of a cosmetic quality, and it is non staining, non irritant, free from rancidity, sufficiently adhesive but can easily washed off if desired, and does not interfere with heat

Unfortunately pasta hamamelidis may be "cracked" by some screening agents—for example, tannic acid



3—Absorption spectra of vanishing-cream base alone and with 5% six different screening agents
I base D alone. II with quinine hydrochloride. III: with nnic acid IV: with Na P.A.B V: with yellow soft paraffin I: with pyribenzamine. VII with salol

following vanishing-cream base "D" is of equally d cosmetic quality but more stable, and makes an n fine emulsion

Stearin	25
Triethanolamine	1
Glycerin	10
Oil of theobroma	1
Cetyl alcohol	0 5
Distilled water	62 5

(To be dispensed in an airtight container)

ishing-cream Base "D" Alone and with Six Screening gents (fig 3)

he six screening agents were added to base "D" concentration of 5% and the order of effectiveness found to be

m 'D' with tannic acid	Effective
, quinine hydrochloride	Effective
, ,, ,, pyribenzamine	Effective
, ,, , sodium *p*-aminobenzoate	Relatively effective
,, ,, salol	Relatively effective
, base alone	Ineffective
, , with yellow soft paraffin	Aggravating

he slight leakage with sodium *p* aminobenzoate was bably due to faulty spread, since it only occurred a half or less of the band and in subsequent absorption pectra the cream was found to be fully effective when contained 5, 10, or 15% of sodium *p* aminobenzoate r 2 5, 5, or 10% of tannic acid, but not completely ffective with 1 25% of tannic acid The aggravating ffect produced by the incorporation of yellow soft araffin, which was intense with 5%, was noted in a sser degree with 12 5 and 25% of paraffin, but with 0% this cream had a screening effect as complete as hat of emulsifying base "A" (containing 87 5% yellow ft paraffin) or of pure yellow soft paraffin It is portant to bear in mind this potentially aggravating tion that may result from the incorporation of 25% less of yellow soft paraffin in emulsifying bases

Conclusion and Clinical Confirmation—The incorpora on of tannic acid, quinine, pyribenzamine, or sodium aminobenzoate in vanishing cream base "D" makes effective non greasy preparation Salol was found to slightly less effective in a strength of 5%, but Luckiesh al (1946) found perfect absorption in the 2967–3022 Å nds with 10% of this substance

The patient was next irradiated with suberythema d erythema 1, 2, and 3 exposures from a mercury pour lamp after areas of skin had been covered with layer 0 1 mm thick of one of two creams containing of tannic acid and 5% of sodium *p* aminobenzoate spectively in the vanishing cream base "D" For h cream there were four areas, 5 cm square, and 1 ml cream was spread over the whole area of 100 sq cm 4 shows that both creams gave complete protection all exposures The erythematovesicular reaction at the border of the protected areas was much greater with the longer exposures

DISCUSSION

The prevention of sunburn in normal people from over exposure to sunlight is a simpler matter than the protection of a light sensitised person, because in the former we are dealing with healthy skin whereas in the latter the skin is already affected in some way The sufferer from eczema solare, lupus erythematosus, herpes simplex recurrens, or hydroa is often less tolerant than the normal person to the local application of chemicals as well as to sunlight This possibility must be borne in mind when prescribing for lesions already present which have resulted from moderate sun exposure The patient should be warned that it is impossible to forecast whether a preparation will or will not be tolerated, so that trial and error methods have to be adopted The history may indicate the advisability of using one substance rather than another, and the simpler the formula the less is the chance of producing sensitisation reactions and, if they do occur, the easier it is to determine the sensitising agent

Yellow soft paraffin is an effective screening agent by itself, but it is cosmetically impracticable and its immiscibility with water makes it occlusive and liable to impair sweat evaporation On the other hand, emulsifying bases containing 50% of yellow soft paraffin are also effective and are cosmetically more practicable, though still rather greasy Eczematous reactions may occasionally rise from lanette wax used as an emulsifying agent

Rothman (1942) reported that *p* aminobenzoic acid and its esters were as effective as tannic acid and more

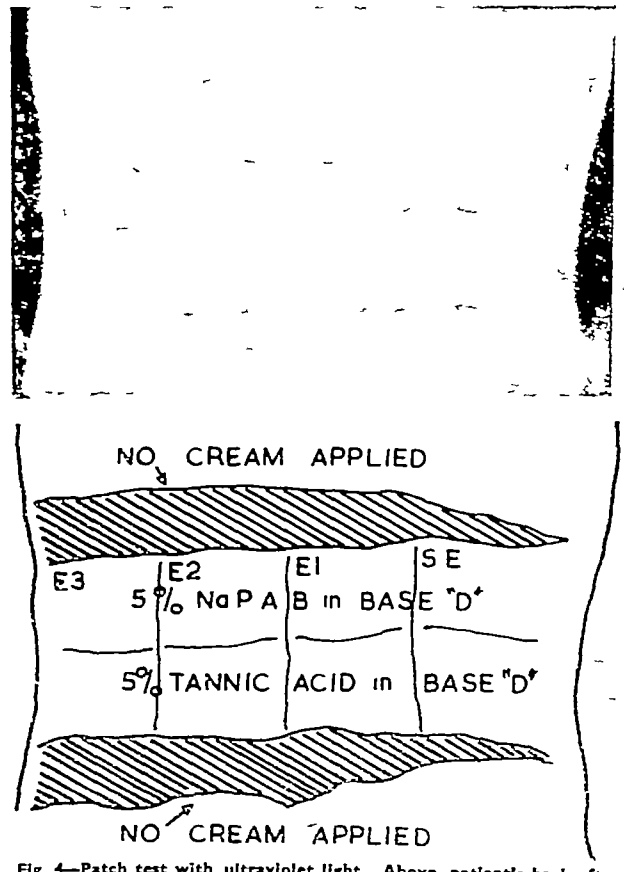


Fig 4—Patch test with ultraviolet light. Above patient's back after exposure Below key Areas E3 were exposed for 3 min 45 sec E2 for 1 min 52 sec. E1 for 45 sec. and S E. for 30 sec.

stable, besides being non staining, odourless, colourless, easily miscible, and non irritating Nevertheless, Baer and Meltzer (1948) have reported sensitisation to monoglyceryl *p* aminobenzoate in a patient who had previously developed eczematous sensitivity to benzocaine and sulphonamides Subsequent patch tests revealed hypersensitivity to unsubstituted *p* aminobenzoic acid amine, paraphenylene diamine, procaine, sulphaguanidine, and a number of other related compounds If, as they suggest, this was cross sensitisation to chemically related compounds, it means that *p* aminobenzoic acid or its esters should not be used for the treatment of light sensitisation states which may possibly have been caused by sulphonamides or related substances

Pyribenzamine has also been reported to cause a severe eczematous reaction when applied in a strength of 2% (Strauss 1948) Sulzberger et al (1948) reported two cases of eczematous reaction among 90 patients for whom this substance was prescribed Baer et al (1948) think that its use is indicated only in selected cases where its combined antipruritic and light filtering action is especially necessary Quinine occasionally produces sensitisation reactions of such severity that its use is hazardous except under strict supervision

Benzyl, menthyl, and sodium salicylate have their advocates, and phenyl salicylate (salol) has been described by Luckiesh et al (1946) as non irritating and non toxic, and giving perfect absorption in a 10% preparation However, salol in tooth powders has been reported to cause eczema of the lips (Sollmann 1948) It is gradually decomposed by alkalis into phenol and salicylic acid, but the liberation of phenol on the skin from contact with alkalis, though a possible cause of eczema, seems an unlikely occurrence Tannic acid 2 5–5% is usually well tolerated and is sometimes used in the treatment of eczema Phenazone is said to be effective (Quiroga et al 1948) but has sensitising potentialities

The vehicle in which the screening agent is to be incorporated must be chosen with care, not only for its emulsifying qualities, on which the effective presentation of the screening substance depends, but also as regards possibly sensitising constituents Thus cream "D," though an excellent emulsion and more stable than pasta acidi stearici or pasta hamamelidis, may occasionally not be tolerated because of its triethanolamine content

Creams are the best vehicles, cosmetically, but Luckiesh and colleagues (1946) point out that in some circumstances they are too easily washed off the skin, which thus loses its protection Any base containing water may break down at freezing temperatures and so be useless in cold climates Alcoholic solutions have been recommended, and Shaw (1946) found the application of a 5–10% solution of *p* aminobenzoic acid in 70% alcohol highly effective in protecting people with lupus erythematosus Tannic acid and quinine both dissolve well in alcohol, and salol will make a 6 6% alcoholic solution Pillsbury et al (1946) recommend the following with the warning that it will stain white clothing

Tannic acid	12 g or ml
Phenyl salicylate	8
Glycerin	8
Alcohol (70%)	to 240

In addition to these chemical parasols, some relief may be obtained from physical screens in the form of calamine, zinc oxide, bismuth subcarbonate, titanium dioxide, ichthammol, or insoluble pigments in face powders and grease paints All these preparations are cosmetically less desirable because more obvious to the observer than chemical screens in vanishing cream bases Nevertheless, they offer the best protection against solar urticaria because the chemical screens are ineffective against the longer visible wave lengths usually r for this rare condition These two formulæ are useful

(1)	Calamine (*B P*)	15 g or ml
	Zinc oxide	5
	Bentonite *	2
	Glycerin	5
	Distilled water	to 100
(2)	Titanium dioxide	15 g or ml
	Bentonite	10
	Glycerin	5
	Distilled water	to 100

* Bentonite is a colloidal clay with emulsifying properties

The addition of anti histamine drugs to light screening creams is not only ineffective but undesirable, with the exception of pyribenzamine which is useful because of its powers of absorption of the sunburn spectrum and not from its anti histamine action There is no evidence that anti histamine drugs given by mouth will prevent sunburn or relieve eczema solare Rubin et al (1947) however, reported relief of urticaria solare from administration of pyribenzamine by mouth

SUMMARY

Protection against the sunburn spectrum is provided by a vanishing cream type base containing tannic acid 5%, quinine hydrochloride 5%, pyribenzamine 5%, sodium *p* aminobenzoate 10%, salol 10%, or yellow soft paraffin 50% Any one of these creams may be used to prevent sunburn, but tannic acid is the first choice

When these substances are used in the treatment of eczema solare and other light activated diseases, a watch must be kept for skin intolerance to the light screening active principle itself or to some component of the base Almost any substance may occasionally cause contact eczema, but some are safer than others, of the above list, tannic acid is the most innocuous, followed by salol, sodium *p* aminobenzoate, pyribenzamine, and quinine

Sodium *p* aminobenzoate should not be used if there has previously been sensitisation to sulphonamides benzocaine

Yellow soft paraffin is an effective screen when added to creams in proportions of 50% or more, but its occl and "heating" properties may cause discomfort proportions of 25% and less it does not screen but, the contrary, has an intensifying effect in the sunl spectral range

The type of base used has a marked influence on the efficacy of light screening agents. The vanishing-cream type of base is both effective and of good cosmetic quality

In the more unusual cases of sensitisation to the violet blue region of the spectrum, these substances are ineffective and recourse must be had to physical screens but these are only partially effective

We wish to thank Mr N K Harrison, of the Photo Department, St Bartholomew's Hospital, and Miss H Todham, pharmacist to St John's Hospital for Diseases the Skin, for assistance in the preparation of this paper and Messrs Ilford Ltd for producing the spectrographs

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AMETHONIUM IODIDE IN MUSCULAR HYPERTONUS

A A GUILD

B.A. Camb, M B Edin, M R C P, M.R C P E

CAL TUTOR AND SENIOR MEDICAL REGISTRAR, WESTERN GENERAL HOSPITAL, EDINBURGH

view of reports (Organe et al 1949, Organe 1949) ie apparently satisfactory and safe use of decame ium iodide (C10) as a relaxant in surgery, it seemed nble to see whether it would prove beneficial in ular hypertonus

MATERIAL AND METHODS

ie following criteria were deemed necessary in ting cases suitable for trial

) The cases should so far as possible, be of hypertonus out any sensory or cerebellar lesion

) The patients should be reasonably coöperative and ligent Preferably they should not show severe degrees paresis, because muscular power is required for the ormance of objective tests

p to now I have only been able to find seven cases ch fulfilled the criteria satisfactorily two cases of vering hemiplegia due to cerebral thrombosis, one e of quadriplegia and one of paraplegia caused by eminated sclerosis, and three cases of parkinsonism e effects of C10 on three healthy volunteers have also n assessed

Theoretically, in the absence of sensory or of cerebel defects and of insuperable mental obstacles, when pertonus is reduced, performance may be expected to prove, provided that muscular power is not also iously diminished This applies both to coarse and fine movements Since the ordinary tests of perform- e and coördination used in clinical neurology can y be used roughly, the following additional tests of formance were applied

1) Using a "cyclometer" fixed to a firm base board, such is sometimes used in making blood counts The number times the patient could depress the lever in 15 sec was ced Results were read automatically from the gauge, ich was hidden from the patient, faulty strokes, which l not cause registration on the meter, were automatically cluded

2) The time taken by the patient to pick up twenty indrical pegs from a smooth surface, and to insert them o holes drilled in a base board, was noted

3) Where knitting was possible the number of stitches tted per minute was counted This test was only used e, because the other patients either did not knit or were weak to knit

4) In the lower limbs performance was judged by noting number of times in 15 sec that the foot could be altern ly flexed and extended, care being taken to ensure that movements were made through a fixed range those of erfect amplitude being discarded from the total count by noting the number of times in 15 sec that the heel be applied to the opposite knee and returned to the the leg being fully extended at the completion of each ment

the performance tests not merely the speed of rmance but also its smoothness was observed pt for knitting and the peg test, a test was per ed five times consecutively at any one time of ig, and the mean was determined Because of the r time required for the knitting and peg tests these only be used once at each time of testing

scular power was tested by a simple apparatus sting of a long capillary U tube (bore 1 mm), with walls, filled with mercury to a third of the length limbs One limb was bent through a right angle e top, and connected by an airtight rubber joint further length of thick walled capillary tubing of equal bore ending in a rubber hand bulb, also attached by an airtight joint The U tube was attached to a back board mounted on a firm base The patient squeezed the hand bulb (the paretic hand being used in hemiplegia), the same type of grip being always used by any one patient The height to which the mercury rose in the opposite limb of the U tube was read on a scale mounted on the back board The patient was not allowed to see the result It will be readily understood that for any one patient a uniform type of grip was essential, because quite different power may be exerted by some people with different forms of grasp

The measurement of tonus presented a major difficulty A satisfactory method of measuring tonus objectively has not yet been evolved In these investigations the apparatus designed by Hartridge (West 1932) was used, in addition to ordinary clinical assessment

In all cases the patient was given an initial training in the performance of the tests, and the effect of C10 was never investigated until improvement in performance from practice had ceased Base line performance tests were made additionally before the injection of C10

DOSAGE AND METHOD OF ADMINISTRATION

Intravenous C10 was given in doses of 2 mg and 3 mg to the three healthy volunteers In the patients the dosage and route of administration had to be reached by trial and error It was clear from the initial experiments on volunteers that intravenous administration was likely to be of no value to the patients It was found that there was little to choose between the intramuscular and the subcutaneous routes Effects were noted earlier, and lasted a shorter time, when C10 was given intramuscularly The dose ultimately used was 1 5–2 5 mg It may be objected that these are small doses compared with those used for relaxation in surgery However, it was found that with more than 2 5 mg the side effects were too severe for C10 to be of any use to hypertonic patients

SIDE EFFECTS

When C10 was given intravenously, a feeling of stiffness in the legs and of constriction in the chest developed almost immediately These sensations passed off in one or two minutes The feeling of constriction was unpleasant and alarming The onset of these symptoms was quickly followed by a feeling of facial flushing (the flush being obvious to observers), "tightness" in the forehead, slight headache, ptosis, diplopia, and inability to focus, with consequent blurring of vision These effects lasted for variable periods the ocular symptoms for up to five minutes, ptosis for ten or fifteen minutes, and headache for up to thirty or forty minutes One volunteer had the impression that he could not locate his limbs properly in space, and performance of the finger nose and heel knee tests (after muscular power had been sufficiently restored) was faulty for up to ten minutes after injection A feeling of slight drowsiness was noted about ten minutes after injection, and lasted for about half an hour Thirty minutes after injection, walking was still somewhat unsteady

In the patients with subcutaneous or intramuscular injections sensations were correspondingly less But all the patients complained of facial flushing, tightness in the forehead, dull headache and sometimes dizziness Four patients complained of diplopia, all had slight blurring of vision with doses of 1 5 mg or more, and all developed ptosis One patient complained of dysphagia after 2 25 mg intramuscularly Blurring of vision lasted for only five or ten minutes, but headache and tightness of the forehead remained from forty to eighty minutes after injection Ptosis lasted from fifteen to forty five minutes

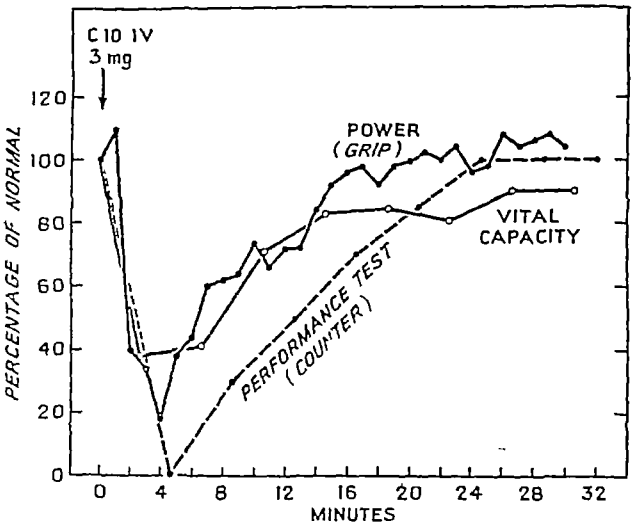

Fig 1—Effect of intravenous C10 3 mg on a healthy person

EXPERIMENTS ON HEALTHY VOLUNTEERS

C10 was given to the three healthy volunteers in doses of 2 mg and 3 mg, 90–120 sec being taken for the injection Observations were made on muscular power (hand grip), on performance, by the "cyclometer" in two instances, and in the third by noting the number of letters typewritten and errors made on typewriting a standard sentence repeatedly in unit time, this volunteer being a touch typist, and on vital capacity A representative result for the larger dose is shown in fig 1 The results were on the whole similar to those obtained by Organe et al. (1949), although in two of the three cases there seemed to be a close relationship between the reduction in power and the diminution in vital capacity Organe et al found reduction in hand strength much greater than diminution in vital capacity Recovery was rapid in all three volunteers, and apparently quicker than that reported by Organe et al C5 (pentamethonium iodide) was not administered in any instance Conceivably, measurement of tidal air, rather than vital capacity, would have been of more practical value No significant effects on pulse rate or blood pressure were noted

EXPERIMENTS ON PATIENTS

In five of the seven patients—one case of hemiplegia, one of disseminated sclerosis with quadriplegia, and all three cases of parkinsonism—either no performance was noted, or actual deterioration after doses of C10 sufficient to produce [illegible] (20–30%) reduction in tonus and the side-effects [illegible] tioned above In the parkinsonian cases the failure C10 contrasted notably with the therapeutic success tincture of stramonium The results in one case shown in fig 2

One case of hemiplegia of recent onset showed improvement in performance and power amounting over 30% after the administration of only 1 5 mg C10 subcutaneously It is thought that power increased because relaxation of hypertonus permitted more effective gripping of the hand bulb The experiment was repeated two days later with almost identical results but, when it was again performed after an interval of four weeks with the same, and larger, doses of C10 no improvement in performance was found. During this period the patient had improved very much clinically and had been receiving physiotherapy

The other patient in whom improved performance was noted was a female, aged 32, with paraplegia due to disseminated sclerosis The effects of [illegible] C10 2 25 mg are shown in fig 3, although the graph does not indicate the smoother manner in which actions were performed at the time of greatest relaxation Similar results were obtained two days later with the same dose Larger doses were not used, because complaints of

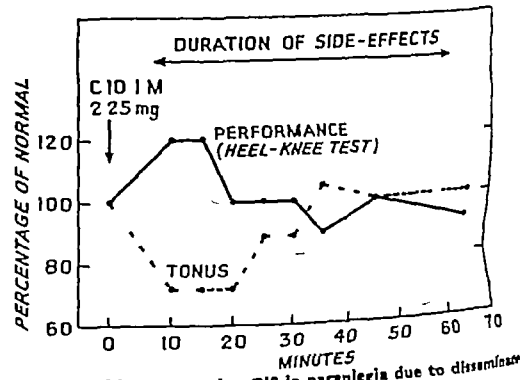

Fig 3—Effect of intramuscular C10 in paraplegia due to disseminated sclerosis

diplopia, inability to focus, and giddiness followed the administration of 2 25 mg After a course of Fraenkel's exercises performance was significantly better than that found at the point of greatest improvement after injection of C10

Parallel control experiments with a therapeutically inert substance could not be undertaken, because of the severe side effects of C10

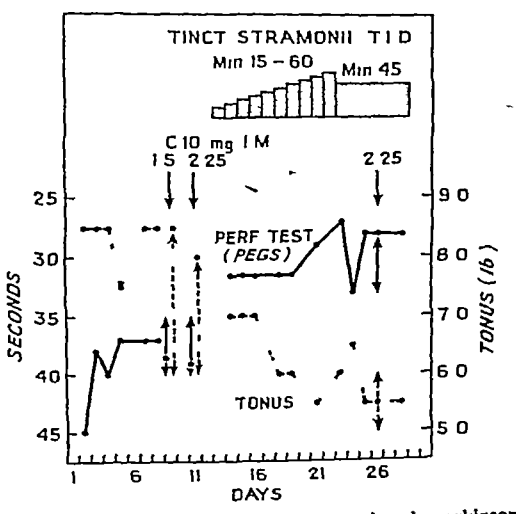

Fig 2—Effects of C10 and of tincture of stramonium in parkinsonism: verticals show range of effects after C10 from initial readings indicated by plotting points

CONCLUSIONS

In five of the seven cases performance either did improve or actually deteriorated after the administration of C10 In the two remaining cases the improvement in performance (in one case temporary only), although significant, was not dramatic, and beneficial results were transitory Unpleasant side effects largely offset the advantages of better performance More protracted action might be obtained by the use of some suspending base

My sincere gratitude is due to Dr W I Card for allowing me to make these studies on patients under his care and for much help and encouragement in the preparation of this paper, also to Dr J M G Wilson and Dr M J Riddell for assistance My thanks are also due to Messrs Burroughs Wellcome and Messrs Allen & Hanburys for supplies of C10 and C5

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TURE OF THE PREGNANT UTERUS BY EXTERNAL VIOLENCE

MARY ELIAS
M.R.C.S.
USE SURGEON, KING EDWARD VII HOSPITAL, WINDSOR

PTURE of the pregnant uterus by external violence re I have found only three cases published in ish.

Lee (1904) reported a case in a woman, aged 40, who in 8th month of her fourteenth pregnancy fell through a en stair the body falling until the protuberant abdomen arrested by a narrow opening She was admitted to ital on the day after the injury, with severe abdominal and vaginal bleeding The abdomen was tense but not er, and palpation revealed a mass high up near the orm cartilage Conservative measures were adopted at but the patient s condition deteriorated 28 hours later operation there was blood in the peritoneal cavity, and ediately beneath the incision, the placenta and mem ies, complete and containing the fœtus, were found A ure was found in the posterior wall of the fundus of the us, and subtotal hysterectomy was done Convalescence complicated by intestinal fistulæ and a pelvic abscess the patient eventually recovered

ev (1919) reported a case in a previously healthy primi vida, aged 22, 21 weeks pregnant, who, while standing on tation platform, suddenly felt faint and fell forwards on to rails Examination revealed only minor injuries, and ugh the patient complained of hypogastric pain abdominal mination revealed an apparently normal 20 week preg ncy After 5 hours the hypogastric pain had increased, a tery vaginal discharge was noticed, and the patient s ndition began to deteriorate At operation 2 days after accident hæmoperitoneum was found and the unruptured um was lying free near the spleen. The uterus was contracted d had an oblique laceration 3 in long on its anterior wall d apparently through the placental site The uterus was tured with catgut in two layers and the abdomen closed e patient made an uninterrupted recovery

Hosking (1923) reported a case in a healthy woman, aged 35, e mother of six children. She was injured by the overturning a motor-car being struck a violent blow over the right side the abdomen She was at the time 6 months pregnant e complained of right-sided abdominal pain and had some ginal bleeding She made a good recovery, remaining well ntil the 16th day after the accident when feeble labour pains gan, and her temperature rose to 101°F Operation was rformed on the 18th day after the accident after an attempt deliver the child, when a completely detached placenta was moved per vaginam. At operation a macerated fœtus was und completely extruded, except for one leg through a nt in the right side of the uterus The fœtus had become alled off by adherent bowel and omentum, it was easily moved after division of the limiting adhesions Blood-clot led the right kidney region The uterine tear extended from ove the external os in front of the right broad ligament e patient s condition was so serious that hysterectomy as out of the question. The blood-clot was removed from the ritoneal cavity some adhesions were freed from the fundus d the uterus contracted fairly firmly A drain was inserted the right lumbar region, and a long strip of gauze was roduced through the rent into the uterus then in front of e broad ligament and behind it into the pouch of Douglas us was brought up to the abdominal wall, and the wound s partly closed leaving a free opening in the lower end withdrawal of the gauze packing The patient made ady progress and was up and about a month later

The following case is reported not only because of its rity but also because of the unusual injury suffered the fœtus

CASE RECORD

A primigravida aged 23 34 weeks pregnant, was admitted hospital on Dec 19 1948 Half an hour previously she had n involved in an accident on the river She had been nding on the deck of a motor launch approaching a closed k gate She had been crushed between the bridge of the k gate and the roof of the cabin of the boat Her only uplaint had been of feeling shaken She had had no abdominal pain and had been unaware of any abdominal injury

On examination a laceration of the abdominal wall was found extending from the left iliac fossa to the right anterior iliac spine and as deep as the sheath of the rectus abdominis *There was moderate shock, the pulse rate was 90 and the blood pressure 98/68* On palpation of the abdomen there was no true rigidity but some guarding in the lower abdomen particularly in the right iliac fossa, which was extremely tender On the left side the buttocks and back of the fœtus could be easily felt, but no fœtal heart sounds were heard Shifting dullness was present and the fundus of the uterus was palpable at the level of the umbilicus Rupture of the pregnant uterus was diagnosed Signs of intraperitoneal hæmorrhage rapidly ensued, the pulse rate increasing, the blood pressure falling to 70/50 half an hour later, and the extremities becoming cold and the face blanched

Initial Treatment—The patient vomited once after a dose of morphine gr $^1/_6$ A pint of plasma was given and subsequently three pints of group O rh rhesus negative blood into both internal saphenous veins The patient s condition steadily improved in the next 3 hours the blood pressure rising to 100/70 and the pulse rate falling to 120

Operation—After premedication with morphine gr $^1/_6$ and atropine gr $^1/_{100}$ anæsthesia was induced with nitrous oxide and oxygen and maintained with ether The laceration of the abdominal wall was cleaned and packed with a swab of cetrimide A midline incision was rapidly made and the peritoneal cavity found to contain about three pints of blood and clot The fœtus with the placenta was lying free in the peritoneal cavity on the left side The uterus was completely torn across at the junction of the upper and lower segments the tear extending into the broad ligaments on each side The fundus of the uterus remained attached only by the fallopian tubes and the ovarian ligaments Both uterine arteries had been divided on the right side 2 in of artery had been laid bare, but the bleeding had largely stopped The fœtus and placenta were removed the peritoneal cavity emptied as far as possible of blood and clot with a sucker The fundus of the uterus was excised with the fallopian tubes, both ovaries being preserved by division of the ovarian ligaments on each side After ligature of the uterine arteries the lower segment of the uterus was repaired with catgut in three layers and the stump of the uterus covered with peritoneum Bleeding from the lower segment was arrested by suturing, and the abdominal incision was closed without drainage The transverse laceration was next dealt with, the edges and lacerated fat excised, the skin sutured, and two small corrugated rubber drains inserted at each extremity

Radiogram of fœtus showing fracture dislocation of cervical spine

As soon as the bleeding was arrested the patient s condition improved blood transfusion being continued throughout the operation

Postoperative Course—On the patient's return to the ward her blood pressure was 130 80 and her pulse rate 100 Penicillin 50,000 units four hourly was given for five days together with sulphadimidine ('Sulphamezathine') 1 g four hourly to a total of 20 g She made an excellent recovery and at no time did her condition give rise to anxiety Radiography of the pelvis and spine showed no bony injury A large bruise developed at the level of the fourth lumbar spine the site of injury to the back in the accident She was discharged from hospital in good condition three weeks after operation

Fœtal Injury—The same severe external injury which had completely ruptured the uterus was also responsible for a fracture dislocation of the cervical spine of the fœtus (see figure) Radiography showed that the body of the fifth cervical vertebra had been fractured and fragmented A limited examination of the cervical region of the fœtus revealed an extensive hæmatoma surrounding the spinal cord from the

level of the second to the seventh cervical vertebra The cord was severed at the level of the fifth cervical vertebra

It appears that the lower segment of the uterus, and the neck of the fœtus, were crushed between the lock gate and the promontory of the patient's sacrum, which was held against the cabin roof

My thanks are due to Mr R Vaughan Payne for permission to publish this case

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Medical Societies

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE 44th scientific meeting was held at Leeds from July 20 to 22 Dr NORAH SCHUSTER, in a presidential address entitled Nec Mors Silet, spoke of the increasing demands made on pathologists who undertook necropsies, today they must pay attention to parts of anatomy which 25 years ago they could safely ignore It was comforting to know that at the age of 80 Leonardo da Vinci was to be seen passing through the streets of Milan on his way to the medical school to refresh his memory on points of anatomy A full medical and occupational history was essential for the pathologist at the time of the necropsy

Allergic Diseases of Blood-vessels

Dr G DISCOMBE (London) said that in polyarteritis nodosa biopsy was sometimes negative Lesions might heal and, if in the kidney, could produce an essential hypertension, the changes of which might almost obliterate those of polyarteritis nodosa Eosinophilia, though common and usually demonstrable by direct counts during the active phase, was not an essential part of the syndrome

Dr W PAGEL (London) said that subendothelial swelling due to permeation of fluid seemed to be followed by exudation of fibrinogen with subsequent necrosis, mostly eccentric, of the vessel wall, a breach in which became plugged with fibrin Fibrin was deposited, too, both inside and outside the necrotic wall He preferred to reserve the term "fibrinoid" for changes which failed to show the staining affinities of fibrin, and which sometimes occurred in positions which made it unlikely that one was dealing with fibrin which had lost its staining affinities In his opinion the differences between polyarteritis nodosa and the "pararheumatic" diseases, including lupus erythematosus disseminatus, dermatomyositis, and temporal arteritis, concerned the natural history of the disease and the preferential site and distribution of the basic change rather than the basic histology, which appeared to be identical. In polyarteritis nodosa extramural foci involved the collagen fibres and were indistinguishable from the acute infiltrative changes in rheumatic fever, lupus erythematosus disseminatus, and dermatomyositis In some instances healed polyarteritis nodosa seemed to be the basis of an eosinophil-cell alveolitis (Loeffler's syndrome) associated with exfoliative dermatitis and asthma (in one case terminated by cerebral hæmorrhage) While in these cases the arterial changes appeared to be burnt out, the eosinophilia was active, so that it was not necessarily to be interpreted as a cellular reaction to local arterial necrosis Intradermal injection of heat-killed streptococci in healthy persons and in rheumatic and other patients who had volunteered had established the significance of bacterial antigens in the reproduction of the changes characteristic of polyarteritis nodosa Both the histological and experimental evidence supported the view that polyarteritis nodosa and the related diseases were an expression of the hyperergic response to any ætiological factor, including bacterial (notably streptococcal) antigen

Dr I RANNIE (Newcastle upon Tyne) said that, for biopsy, muscle was the material of choice, a tender area should be chosen for excision, and a negative report should not be issued until serial sections have been studied

Prof T CRAWFORD (London), said that two types of procedure had led to the production of in animals closely resembling those of polyarteritis man The first, introduced by German about 1930 and used extensively by Rich and in the U S A, consisted in administration of protein to a suitable animal such as the rabbit second, described in this country by Wilson and depended on the production of hypertension by procedure such as the clipping of a renal artery The interpretation of these experiments which Crawford favoured was that the first procedure tissue antigen-antibody reaction characterised by and fibrin deposition in the vessel walls and a reaction around the injured area, whereas with second procedure sudden elevation of blood-pressure caused damage to the less well supported arteries and again led to necrosis and fibrin deposition in the wall, with a secondary cellular response as in the lesion The first procedures seemed to constitute closer parallel to the conditions of the human disease

Other Subjects

Dr G B S ROBERTS (Glasgow) reported *findings in the prodromal stage of measles*

Koplik's spots developed twelve days after the administration of convalescent measles serum and the child died from fulminating pneumococcal meningitis which occurred before the appearance of the rash The lymphoid tissue throughout the body showed hyperplasia of the germinal centres with formation of large multinucleate giant cells of the Warthin Finkeldy type A second case was mentioned, in which a cervical lymph node, removed at operation, was found to show typical Warthin Finkeldy giant cells Although this child had been exposed, a clinical attack of measles did not develop so it seemed possible that infection could produce histological changes without any clinical manifestation of the disease Giant cells found in the lung of the fatal case contained large numbers of acidophilic intracytoplasmic inclusion bodies varying greatly in size and shape

An attempt to communicate the disease to rabbits by intravenous inoculation of citrated blood taken from patients on the day of appearance of the rash was unsuccessful.

Dr I FRIEDMANN (London) reported that the *Papanicolaou method of diagnosis*, despite limitations was of real value in the diagnosis of tumours of the nose and throat

Dr T B MAGATH (Rochester, Minnesota) discussed various phases of the *prothrombin* problem, and described a convenient one stage technique

Plasma, serum, and platelet extracts possessed activity concerned with the conversion of prothrombin to thrombin Since zymin plasma produced a conversion deficiency which differed from that produced by ageing or by ammonia, it was apparent that there was more than one conversion factor A apparently low prothrombin value might be caused by a lack of one or more conversion factors The thromboplastic effect of platelets was due partly to an associated prothrombin conversion factor, while complement had been shown to possess properties very like some conversion factors in plasma Several experiments were described and critical values for dicoumarol therapy given.

Dr R AIDIN and Dr G H TOVEY (Bristol) gave an account of *sixth day disease*, a syndrome consisting of prematurity, jaundice, and kernicterus, with death usually about the sixth day of life In their experience kernicterus was most commonly found in this condition 25 examples, unassociated with hæmolytic disease, having been found in a series of necropsies on 144 premature infants While the naked eye appearance was indistinguishable from the kernicterus found in hæmolytic disease, clinical, necropsy, histological, and serological studies failed to support a diagnosis of hæmolytic disease, neither was there any evidence of sepsis or syphilis.

Dr R W FAIRBROTHER (Manchester) dealt with *clearance of Staphylococcus pyogenes from the nose* The application of penicillin cream had proved of value but the clearance was usually only temporary, for staphylococci tended to recur a few weeks after the cessation of treatment, in spite of repeated courses of the cream In some instances the fresh organisms were of a type different from that of the original staphylococci

Vice-Marshal T C St C MORTON (Wendover) ied the *carrier rate of amœbiasis in Britain* Of R A F apprentices, 16 had been found to carry *aba histolytica* cysts, and 3 cases of amœbic ery, 1 fatal, had been encountered in R A F nel who had never left Britain Of these, 2 had ontact with patients suffering from dysentery icted overseas

T B MAGATH believed that the incidence of rs in the United States was of a similar order, ly, about 1 6–2 0%, although textbooks often d a carrier-rate of 10% It took many years of ience to become proficient in recognising pathogenic oœ and he believed that iron hæmatoxylin was the stain

G S WILSON (London), describing the survey made igland and Wales during 1943–45 on the distribution frequency of *non-pulmonary tuberculosis caused by vine type of bacillus*, took the opportunity of thank- he 149 pathologists who had collected specimens ngland strains from 994 patients had been examined hese, 26 3% belonged to the bovine type The entage distribution according to site of disease was inges 27 1, cervical glands 46 5, bones and joints , genito urinary system 12 8, miscellaneous 10 6 proportion of bovine-type strains was highest in the nd quinquennium of life, and higher among females n males. It was calculated that in England and les during 1944 about 24% of all cases of non- monary tuberculosis were of bovine origin and that 0 to 1400 persons died of milk-borne tuberculosis Dr son drew attention to the high proportion of mistaken gnoses in cervical adenitis and suggested that further k was required to distinguish the tuberculous from er forms of the disease

Dr G STEWART SMITH (Exeter) spoke on the problem non pulmonary tuberculosis as seen in an urban and al community in the south-west

Dr A. J RHODES (Toronto) gave an account of the *demiology of the Coxsackie virus* and of a recent idemic in Dufferin county, in which the viruses both poliomyelitis and of the Coxsackie infection appeared take part, it appeared that the two viruses possessed imilar epidemiology Dr F O MACCALLUM (Colindale) scribed the results of investigations of material sent the Virus Reference Laboratory, and discussed current oblems of diagnosis

Dr J B FOOTE (London) discussed the interpretation *blood-cholesterol* estimations, favouring the method of oor because of its simplicity, reproducibility, and eed. However, in a series of 35 male and 17 female edical students, he and Dr Merivale had found the rmal range to be 150 to 350 mg per 100 ml The ethod had the disadvantage of not separating free olesterol from its esters, and rate of colour production id intensity of colour were not the same for free and ter cholesterol Nevertheless, by careful attention to hnique, the errors tended to cancel out Despite the ered normal range they confirmed the usefulness of e estimation in the diagnosis and control of treatment 22 cases of myxœdema, but in 49 examples of thyro- icosis the overlap with a normal range was so great 8%) that the use of serum-cholesterol estimations its diagnosis was precluded 30 cases of hepatitis estigated at the Westminster Hospital showed a wide atter and 90% overlap with a normal range

Dr P G WALKER and Mr R D WILKINS (London) npared the polarographic serum waves with the al and formol-stable *serum acid phosphatases* in a ies of cases diagnosed clinically as malignant disease the prostate 55% had abnormal polarographic ves and 52% abnormal phosphatase values, but se did not necessarily coincide, for while in 25% both lues were high and in 75% one or other was above rmal, both values were within the normal range 25% of cases

Prof C H GRAY (London) made observations on acute phyria, 8 examples of which had illustrated the great iation in the clinical picture and had supported the w that this condition was wholly different from ngenital light-sensitive porphyria. In all probability, said, congenital porphyria was a genetically determined enzyme abnormality, probably localised in the bone marrow, leading to production of type 1 porphyrins in excess during erythropoiesis In acute porphyria there might be an excessive production of mono-pyrrolic porphyrin precursors, possibly in sites of porphyrin synthesis other than the bone marrow The clinical condition could be brought about by a direct action of the porphyrins on the central nervous system, or by primary changes in the central nervous system resulting in the excessive production of porphyrin precursors or by the direct action of the porphyrin precursors themselves on the central nervous system

Dr E M DARMADY, Dr J HARKNESS, and Dr A RICHARDSON JONES (Portsmouth) drew attention to the fact that oliguria and anuria might follow a large number of precipitating agents, over 60 of which had already been described The majority of cases, however, ran similar courses and could be divided into three phases

The first was one of precipitation, frequently taking the form of shock in which there was oliguria and hæmoconcentration This was followed by the anuric or oliguric phase in which there was a rapid rise in blood urea, a fall in sodium and chlorides, and a rise in potassium, with its danger of acute cardiac failure It was important to restrict fluids in this second stage The two methods of controlling accumulation of metabolites, either by dialysis, as a temporary measure, or by a high fat and high carbohydrate diet, were reviewed

In the third, or diuretic phase, the evening output might rise very suddenly, often with a serious fall in potassium Faulty hydration was, in their opinion, the important aspect of the disease

Dr C J YOUNG (Bradford), in considering the *agranulocytosis of glandular fever*, expressed the opinion that this was a diagnosis which was commonly missed When looked for, 3 examples had been seen in a period of just over two years, one of which yielded new information on the nature of the condition In this case the marrow was found to be normal, but the granulopenia persisted in the blood and was still present $2^1/_2$ years later The condition was liable to be confused with drug agranulocytosis but there were four features which helped to distinguish it, although none were specific these were the Paul-Bunnell test, the constant presence of a few polymorphs in the blood, the normal bone-marrow, and the absence of fatalities Dr Young suggested that agranulocytosis was due to the unduly rapid removal of polymorphs from the blood, and not to a failure to produce them in the marrow He recommended that glandular fever should be looked for in agranulocytosis which might be due to other causes When granulopenia was due to this condition the prognosis was good, and the patient need not be deprived of a suspected drug, if it was likely to help him Bacterial invasion could, however, occur

Dr OSCAR B HUNTER, jun (Washington, D C) referred to reports that *carcinoma in situ in the cervix* might develop into invasive carcinoma However, proof that carcinoma in situ was actually the precursor of invasive carcinoma was presumptive Biopsies might miss an invasive carcinoma, whereas in attempting to examine the cervix adequately conisation sections might completely destroy the lesion

Other evidences of the relationships existed, in that the statistical incidence of cases of the two lesions were approximately the same Carcinoma in situ averaged round 35 years of age, whereas invasive carcinoma was 45 years From experience of 20 cases of clinically occult cervical lesions discovered by positive cytological examination, he had discovered extremely early evidence of invasion in what was otherwise only carcinoma in situ This evidence had been found after serial sections of the cervices

Dr C MERSKEY (Oxford) described laboratory findings in cases of hæmophilia

He advised using both the techniques of Lee and White and of Dale and Laidlaw for a study of the coagulation time The former had proved more consistent, though the latter, because it was made on capillary blood, was valuable, especially in children. Though usually greatly prolonged, the coagulation time in undoubted instances of hæmophilia might be consistently normal whilst in others it was only slightly prolonged He spoke too of the defect of consumption of prothrombin during coagulation, a defect which was marked

when the coagulation time was greatly prolonged In fact the serum from either venous or capillary blood appeared to contain even more prothrombin than the original plasma In instances where the coagulation time was normal the defect was less, but usually was demonstrable on serum derived from venous, but not capillary, blood The addition of a small proportion of normal blood to known hæmophilic blood greatly improved the coagulation defects of the latter by reason of its making available some of the "antihæmophilic globulin"

There appeared to be all grades of the hæmophilic defect as measured by the coagulation-time, the degree of the prothrombin consumption defect, and the absence or unavailability of antihæmophilic globulin The degree of the defect in any individual remained fairly constant from year to year and seemed to breed true in any particular family even over a number of generations

Dr J V DACIE (London) referred to a number of discrepancies concerning the behaviour in vitro of *cold hæmolysins* in cases of cold hæmoglobinuria He concluded that as real differences existed between the behaviour in vitro of cold hæmolysins no test should be regarded as negative unless it had been carried out with *serum acidified within the pH range 6 5–7 5* and a further tube set up in which an equal volume of fresh normal serum had been added to the patient's serum, so as to provide an adequate concentration of complement The patient's serum should never be heated, and fresh serum must be present in both the cold and the warm phases

Speakers at the dinner of the association included Prof MATTHEW STEWART and Dr ROBERT A MOORE, professor of pathology at the Washington University of St Louis Missouri

New Inventions

SIMPLE "BOOSTER" FOR OBSTETRIC GAS-AIR APPARATUS

THE gas air mixture in *obstetric analgesia* machines is set to such a degree of safety that any further dilution with air renders it ineffective—a practical application of this fact being the necessity of ensuring that the mask accurately fits the patient's face It is not generally appreciated, however, that, in the intervals between uterine contractions, when the apparatus is not in use, air diffuses via the mask and finger-hole into the delivery tube and dilutes the nitrous oxide to such an extent that it takes several breaths before the mixture is restored to full strength the next time the mask is applied Hence the effects of analgesia are delayed and relief is not so complete as the legal mixture is capable of producing

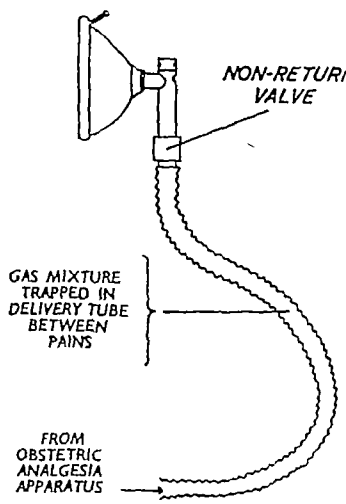

Fig 1—Site of booster

The device illustrated in fig 1 is designed to avoid this disadvantage It consists of a facepiece mount placed between the mask and the delivery-tube and containing a non-return spring valve (fig 2) which traps the gas-air mixture and prevents dilution by diffusion Thus, once the machine has been used during a contraction the delivery-tube will thereafter retain a full strength mixture, so that each time the mother applies the mask she will inhale this mixture *from the very first breath*

Three of these face mounts have been in constant use in the obstetric wards of King's College Hospital for the past ten months and the sisters report a remarkable improvement in the efficacy of gas air analgesia since their introduction They are quite robust and have

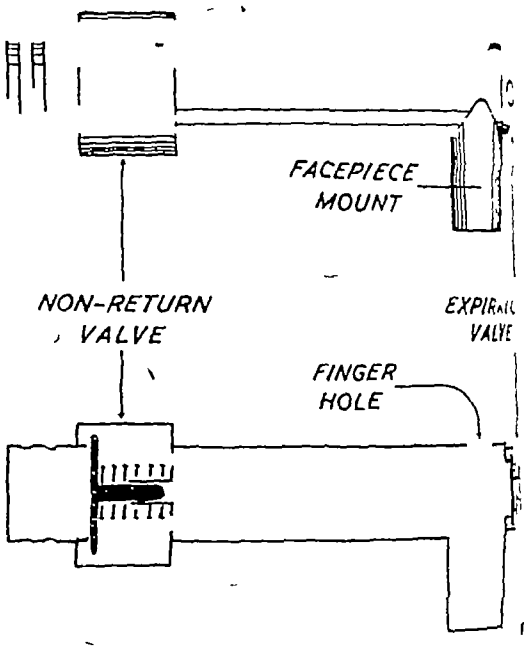

Fig 2—Details of valves

stood up to the usual buffeting without any impairment of the valves

The device has been made by Medical Pneumatics Ltd of 28, Theyer Street, London, W 1, and I wish to thank Mr H A Talley of that firm for ensuring that the non-return valve does not add appreciably to the weight of the face-mask or make it clumsy to hold

A. H GALLEY
M.B Lond, F.F.A R.C.S
Anæsthetist to King's College Hospital London

Reviews of Books

Textbook of Gynæcology (3rd ed London William Heinemann 1950 Pp 477 24s)—Mr J H Peel brings up to date his well known textbook, which first appeared in 1943, as a revision of Forsdike's work No attempt has been made to cram into a text intended for students every phase of gynæcological practice (indeed he seems to be aimed rather at excising those methods which have not stood the test of time), but the treatment sections have been thoroughly revised, and the illustrations, always good, have been further enriched by a series of new photomicrographs

Medical Jurisprudence and Toxicology (9th ed Edinburgh E & S Livingstone 1950 Pp 755 3ns) This famous textbook has been given a new and contemporary balance Prof John Glaister has included new material the liability of hospitals and nursing homes the medical aspects of artificial insemination, the National Health Service National Insurance, and many other topics War gas has been omitted, and the effects of blast relegated, prematurely to the end of the chapter on wounds, but effects of the atomic bomb have made their first appearance New substances added in the section on toxicology are D D T, amphetamine sulphate, beryllium, and radioactive substances

A New Dictionary of Chemistry (2nd ed London Longmans, Green 1949 Pp 580 60s)—This work edited by Stephen Miall and L Mackenzie Miall, is described as a 'compact work of reference,' and such it is It contains some 5500 references, it is smaller in size than most comparable dictionaries Its value lies in the fact that it is largely an initial reference book, but it is not altogether free from errors Thus it was not Madame Curie who, with Joliot discovered artificial radioactivity, dehydrogenases are not usually considered reducing agents Some may feel that in future editions it would be better to remove the biographies of living persons, especially as they tend to become out of date rapidly In their place, more references to original work on individual subjects could usefully be given

THE LANCET

LONDON SATURDAY, AUGUST 12, 1950

Tobacco and Lung Cancer

ONE of the first questions likely to be asked in y discussion of the ætiology of cancer of the lung whether there has been any real increase in the ease since, say, the beginning of this century The swer is that we do not know, because there are no ures either here or in any other country on which e actual death rate from intrathoracic cancer of rty years ago can be compared with that of today ASSEY and HOLMES [1] analysed the available post ortem records of British teaching hospitals up to e end of 1928 and could find no evidence of any crease, though their survey covered a period in hich there had apparently been a dramatic increase other European countries [2] Professor DUNGAL, ho discusses the low incidence in Iceland on p 245, sumes that there has been a real increase in Britain d the United States, but this cannot yet be proved owever, in 1947, on the basis of the Registrar-eneral's figures, KENNAWAY and KENNAWAY [3] ssessed the apparent increase in this country (on hich all authorities agree) and concluded that it probably real—at least in part

Three known facts about lung cancer must be of tiological significance its high incidence among ickel, cobalt, and pitch-blende miners in Schneeberg Saxony) and Joachimstal (Czechoslovakia), its late ppearance in sufferers from asbestosis, and its prefer-ice for males Of these three, only the sex-distribu-on is likely to be a direct help in unravelling the cause lung cancer in the general population, though the lation between fibrotic lung disease and the subse ent development of cancer has parallels in other gans ORR'S [4] experiments have shown that stromal anges may alter the vascular conditions in the sues, with the result that the parenchymatous cells hich can best withstand the altered conditions may crease at the expense of the rest and thus become alignant cells The fact that the incidence of enocarcinoma is five times as great in women in men [5] may also be ætiologically significant hen we come to the possible environmental factors hat might explain the apparent increase in lung ncer, tobacco smoking, tarring of the roads, and inhalation of exhaust fumes from petrol engines suggest themselves at once There seems to be no experimental or clinical evidence of the carcino genicity of dust from tarred roads or fumes from motor engines—no one has suggested that there is a special susceptibility to lung cancer in motor drivers or engineers, who must inhale a larger amount of exhaust fumes than most other sections of the community But tobacco smoking is another matter, and their recent clinical investigation in the U S A has led WYNDER and GRAHAM [6] to conclude that the "excessive and prolonged use of tobacco, especially cigarettes, seems to be an important factor in the induction of bronchiogenic carcinoma" At the International Cancer Congress [7] in Paris last month, other American speakers supported their view that the incidence of lung cancer is significantly higher in heavy smokers than in non smokers

WYNDER and GRAHAM personally interviewed 634 patients in whom cancer of the bronchus had been diagnosed by microscopical examination of tissue obtained at biopsy or of bronchial secretions The smoking habits of these patients, determined by medical observers and assessed by an arbitrary method over 20 years, were compared with those of three control groups of hospital patients sufferers from chest diseases other than bronchiogenic cancer, inpatients of the general medical and surgical wards (both of these groups were questioned by non medical observers), and a final group similar to the second but interviewed by physicians In other words, the smoking habits of the lung cancer group were com pared with those of the general hospital population and not with the population as a whole Some criticisms may be raised Was the method of diagnosis reliable, and was any attempt made to confirm it at necropsy? Most pathologists in this country would hesitate to affirm that the diagnosis of lung cancer by biopsy is accurate enough for research purposes Again, do the smoking habits of a hospital population fairly represent those of the whole population? May not patients with chronic chest and other diseases have cut down their smoking because of their chronic ailment? Then, might some other factors that were not investigated have been concerned? No attempt was made to ascertain whether the control groups of patients contained the same proportion of urban and rural dwellers, who might be expected to have different smoking habits Despite the large scope of this inquiry, it seems therefore that confirmation from other sources is needed

Professor DUNGAL has reviewed close on two thou sand necropsies he and his assistants have done at Reykjavik in 1932–48, and he has found only 12 lung cancers, an incidence of 0 6% This is, he says, as low an incidence as many European countries had 40–50 years ago, and he relates it to the very moderate consumption of tobacco in Iceland up to the beginning of the late war Since then smoking has increased rapidly—from under $^1/_2$ lb a head in 1940 to nearly $1^1/_2$ lb in 1947—and DUNGAL foresees a corresponding rise in the incidence of lung cancer 20–25 years hence, on the assumption that a carcinogen will take this time to produce a manifest growth If his argument is accepted we in this country must expect a rising

1 Passey R D Holmes J M *Quart J Med* 1935 4 321
2 Bonser G M *J Hyg Camb* 1934 36 218
3 Kennaway E L Kennaway N M *Brit J Cancer* 1947 1 260
4 Orr J W *Acta int contra Cancer* 1948 6 52
5 Fried B M Bronchiogenic Carcinoma and Adenoma London 1948 p 39
6 Wynder E L Graham, E A *J Amer med Ass* 1950 143 329
7 See *Lancet* Aug 5 1950 p 235

incidence of lung cancer for something like 20 years at least, for there seems to have been a steady increase in tobacco consumption up to 1946, though since then the heavier duty has produced a sharp fall The following figures, kindly supplied by the Statistics Division of the Board of Trade, give a good rough measure of the tobacco actually smoked in the United Kingdom in the last 25 years

ANNUAL AMOUNTS OF IMPORTED AND HOME GROWN TOBACCO CLEARED BY CUSTOMS FOR HOME CONSUMPTION OR SUPPLIED DUTY FREE TO SHIPS' STORES, H M FORCES OVERSEAS, AND PRISONERS OF WAR

Tobacco (million lb)

Year ended March 31	For home consumption	For ships and H M Forces overseas	Total
1924	128 8	2 7	131 5
1925	129 1	3 1	132 2
1926	134 8	2 8	137 6
1927	137 0	2 6	139 6
1928	137 9	3 1	141 0
1929	141 9	3 0	144 9
1930	151 5	3 9	155 4
1931	154 7	2 5	157 2
1932	145 5	2 3	147 8
1933	150 5	2 3	152 8
1934	152 2	2 4	154 6
1935	159 0	2 4	161 4
1936	168 8	2 6	171 4
1937	174 5	2 9	177 4
1938	187 9	2 8	190 7
1939	192 0	2 8	194 8
1940	200 6	6 4*	207 0*
1941	190 4	7 0*	197 4*
1942	236 0	14 5	250 5
1943	229 3	26 3	255 6
1944	221 6	44 3	265 9
1945	219 5	62 5	282 0
1946	238 6	61 5	300 1
1947	255 6	18 6	274 2
1948	211 8	13 3	225 1
1949	212 3	6 6	218 9

* Excluding unknown quantity exported direct from manufacturers to canteens, &c for H M Forces overseas and recorded as Merchandise '

The question whether tobacco contains carcinogenic substances should, one would suppose, be answerable from experimental research FLORY,[8] who tested on rabbits' ears the carcinogenicity of tar produced by the destructive distillation of tobacco at 350–700°C, concluded that the tar contained a weak and slowly acting carcinogen The temperature was not far removed from that which obtains in pipes and cigarettes, but the conditions of the experiment were entirely different from those which would govern the exposure of the bronchial and bronchiolar epithelium to tobacco smoke Many fruitless attempts to induce bronchial carcinoma by "smoking" laboratory animals in closed chambers have not even been deemed worthy of record A more significant contribution to the ætiology of this disease may well be the demonstration of benzpyrene in the suspended matter obtained from the air of London, Sheffield, Manchester, Liverpool, Burnley, Bilston, Hull, Bristol, and Leicester [9] This hydrocarbon, a constituent of coal tar, is an undoubted and potent carcinogen Those who inhale the polluted atmosphere of any of these towns may derive a grain of comfort from the fact that "no evidence has been found so far of any formation of benzpyrene by the combustion of tobacco"

8 Flory C M. *Cancer Res* 1941 1 262
9 Annual Report of the British Empire Cancer Campaign for 1949 p 98

Ion-exchange Resins

CLINICIANS are paying more and more atter changes in the composition of the extracellu of the body [1]—the *milieu interieur* of CLAUDE B —particularly in its content of sodium and In this they are being aided and abetted b chemists, who are providing them with two tools, both of which are beginning to be used in hospitals The first is a diagnostic tool, the photometer, by means of which the con of sodium or potassium in serum, urine, or other can be estimated in a few minutes with great accu The second is therapeutic, and comprises the of substances known as ion exchange resins wh will remove sodium or potassium ions from solut in exchange for other ions

The ion-exchange or base exchange principle been applied commercially for many years, a fami example being the 'Permutit' water softeners Th is a group of insoluble silicates which can abstr various ions and some non-ionisable compounds fr solution and hold them in light combination. W even a temporary inundation by sea water re agricultural land for many years is mainly because silicates in the soil hold on to the sodium ion Permut a synthetic zeolite, is one of these silicates In water softeners the hard water is brought into cont with permutit which has previously been satur with salt and is holding sodium ion in loose combi tion Permutit has, however, a greater affinity calcium and magnesium than for sodium, and as hard water flows through the softener the calci and magnesium ions are taken up in exchange sodium and the water becomes soft This proc can be continued indefinitely if the permutit resaturated with salt from time to time A sim process has provided the answer to the age old prob which became acute in the late war—how to m sea-water drinkable Into a rubber bag which has filled with sea water the ditched airman or s wrecked seaman puts one of his zeolite briquet crushed up, he shakes the bag well, and very soo can squeeze the bag and obtain potable water f the exit tube

In 1935 synthetic phenol formaldehyde resins cation exchange properties began to be developed resins were prepared from aromatic amines and form dehyde which have anion exchange properties 1944 STEINBERGER [3] used a cation-exchange resi remove calcium from the blood, replacing it sodium ion, and so prevented clotting SEGAL his collaborators [4] used an anion exchange resi reduce the acidity of various solutions, in partic gastric juice in vitro They also demonstrated the resin was virtually nontoxic to rats which it by mouth over long periods SPEARS and PFEIFF have lately treated 18 cases of peptic ulcer wi cation exchange resin with encouraging results approach to the correction of a disturbance in composition of the body fluids was made in 194 MUIRHEAD and REID [6] who tried a "resin artif

1 For a masterly introduction to these changes and the cond in which they arise see J L Gamble s monograph (The Anatomy Physiology and Pathology of the Extrace Fluid. Cambridge Mass 1949
2 Adams B A Holmes R L *J Soc chem Ind* 1935 54
3 Steinberger A *J roc Soc exp Biol N Y* 1944 56 1
4 Segal H L Hodge H C Watson J S Jun Scott W *Gastroenterology* 1945 4 484
5 Spears M M Pfeiffer M C J *Ibid* 1950 8 191
6 Muirhead, F F Reid A *Lab clin Med* 1948 33 8

y" in the treatment of bilaterally nephrec ed dogs The dogs were fully heparinised, and al blood was circulated through a tube containing ture of cation and anion exchange resins, which been pretreated with a solution of electrolytes in concentrations normally present in the extra lar fluid The resins can take only a relatively l amount of urea out of solution, but when they aturated they can be washed free again with the nal pretreatment fluid In this way urea can be ved from the uræmic animal—admittedly rather ly—and electrolyte disturbances can be partially ected The method will not remove excess water the body directly, as can be done by peritoneal ysis or with KOLFF's "artificial kidney," but the rect removal of water from œdematous patients se renal function is adequate can be achieved by ctive removal of the sodium ion from the body odium ion exchange resins may turn out to be of siderable clinical value IRWIN et al [8] have shown t cation exchange resins given by mouth will bind ary sodium in the intestine, and a normal person's nary excretion of sodium can be reduced to less n 0 2 g daily despite an intake of 6 0 g of salt ey also gave the resins by mouth to two patients h cardiac failure and œdema and one patient with rhosis and peripheral œdema, and in all three the luction in œdema obtained was greater than with rsaly l Four American groups of workers [9-12] have ely reported on their experiences with cation change resins Their results in cardiac œdema have ain been promising In this method of treatment e sodium ion is exchanged either for H^+ or NH_4^+, d acidosis may be induced or aggravated if renal ction is inefficient The possible loss of other ions, particularly potassium and calcium, is other danger that must be borne in mind Theo ically, at least, this can be avoided by partially turating the resin beforehand with potassium and lcium Patients can take the dry granular resin in antities up to 100 g a day without difficulty, and nstipation is seldom troublesome The preparation n now be obtained in this country So perhaps efore long our patients with hypertension, cirrhosis, cardiac failure will discard their salt-free diets and t normal food, leaving it to a resin to remove the dium from their intestines

Nutrition in South and East Asia

IN these days the newspapers and wireless give all o frequent accounts of the failure of the United ations to bring men together and to settle their fferences of opinion These failures make it easy lose confidence in the possibilities of international öperation and to relapse into a spirit of national auvinism which we know should be outmoded It important therefore to note well the successes of NO, for these are the shoots from which we may pect fresh growth and development One such ccess is the Nutrition Committee for South and ast Asia, organised by the Food and Agriculture rganisation of the United Nations, whose second meeting was held at Rangoon last February with Dr JUAN SALCEDO, of the Philippines, in the chair [1] Delegations attended from Burma, Ceylon, India, Indonesia, Korea,[2] the Philippine Republic, and Thailand, and there were representatives from France the United Kingdom, and the United States, as well as of the other U N organisations, UNESCO, UNICEF, and W H O

Rice is, of course, the staple food in South and East Asia, and the committee were much concerned with ways and means to improve both its quantity and its quality A recommendation of the previous meeting that a thiamine content of 1 5 microgrammes per gramme should be regarded as a minimum standard for milled rice was reaffirmed, but the attainment and enforcement of such a standard is handicapped by the lack of a suitable method of thiamine assay Two methods (the thiochrome and the microbiological) can be used, but each requires equipment and analytical skill to be found only in a few big centres in Asia The committee urged the need to discover a more convenient method Methods of milling and parboiling the grain vary greatly according to local customs and techniques, and so does the new process of "enrichment" by additions of thiamine, riboflavine, and nicotinic acid Different methods of washing and cooking in the home also affect the loss of nutrients That the rice grain must lose some nutrients in the processes through which it passes between harvesting and consumption is inevitable, and these losses can only be minimised if detailed studies—some chemical and engineering, others social and economic—are carried out in the mills, warehouses, bazaars, and homes of each of the diverse rice eating areas The promotion and coördination of these studies is an opportunity for an international agency

Rice diets usually contain too large a proportion of the cereal and are defective in foods rich in proteins minerals, and vitamins, such as pulses, fish, and vegetables Milk is seldom taken in sufficient quantities Recent technological work on the manufacture of "partial milk substitutes" from soya bean and other foods has so far been only on a laboratory scale with small field trials Joint effort by commercial organisations and governments is necessary if such new food preparations are to be widely distributed The committee thought that work of this nature should be encouraged, but recommended that in each country attention should be concentrated on sources of food readily available locally

The British welfare food services and school meals services are prototypes on which others look with a mixture of critical admiration and envy In rice eating countries, the high infantile and juvenile death-rates and widespread malnutrition among children all point to the need for schemes for providing assistance in the feeding of mothers and children Unfortunately, these countries have neither the food and money nor the administration needed for developing welfare food services on a scale comparable to our own Nevertheless, a number of them have been able to start feeding programmes, and in the last two years these have been extending Much ingenuity is being

Kolff W J Berk, H T J *Acta med. scand* 1944 117 92
Irwin, L Berger E Y Rosenberg B Jackenthal R *J clin Invest* 1949 28 1403
Kahn S S Emerson, K. *Ibid* 1950 29 821
Kraus H *Ibid* p 829
Currens J H *Ibid*, p 807
Danowski, T S *Ibid* p 807

1 Report of the Nutrition Committee for South and East Asia Second meeting Rangoon Burma Jan 30 to Feb 4 1950 F A O publication, pp 23 Obtainable from H.M. Stationery Office

2 The Korean delegate came from the department of public health Seoul but is listed as representing Korea

used in devising cheap meals from foods grown within their own borders, and as experience is gained there should be a corresponding improvement in child health The committee also discussed the problems of feeding industrial workers, whose numbers are steadily increasing, and plantation labourers the low standards of health and economic efficiency among these classes can be much improved by communal feeding schemes In considering nutrition education at various levels, the committee agreed that there is a need for highly qualified nutritional workers able to accept administrative responsibility and to plan new ventures Such persons will require postgraduate education, both within and outside the region The methods of teaching the elements of nutrition to nurses, school-teachers, and other people in influential positions were also debated

F A O has neither the resources nor the finances to carry out big nutritional programmes in individual countries There is no master "United Nations Nutrition Plan" to feed the peoples of Asia and save them from the ever-present threat of starvation and famine Perhaps this is just as well, grandiose schemes for social betterment readily lead to disappointments and disillusionment F A O is at present an agency for coordinating nutrition work in the countries, and for collecting, sorting, and distributing the mass of technical information on nutrition is slow work and does not yield quick results Yet it is this building of a firm foundation of knowledge that is necessary for social development A dissemination of agricultural, economic, and physical principles and techniques among underdeveloped peoples is an essential beginning to the establishment of a stable political structure In considering the present Asiatic scene, we must remember that war and aggression are old and well known manifestations of human evil, and that present unrests are continuations of long-established tensions By contrast, international scientific conferences, with official delegates from many countries, are something new and encouraging The fact that such conferences are now held with success, as this report shows, is a sufficient excuse for an optimist to believe that there is a future both for the United Nations Organisation and for the poor rice eaters of Asia

Annotations

FIRE

"HOUSE on fire" is an accident which everybody expects to watch, never to experience As a new booklet,[1] prepared by the Interdepartmental Fire Prevention Committee and the Central Office of Information, points out, fire nearly always strikes without warning, and the danger may be recognised too late to avoid disaster We all think we know the rules for preventing fire in the home, yet probably everyone who reads this little book will find in it one or two things which take him by surprise Do most of us realise, for example, that it is dangerous (as well as inefficient) to earth a wireless set to a gas pipe? Or that "mains" leads to wireless sets which get warm in use should be open to full length and not coiled or placed inaccessibly behind furniture? Or that tubular or panel electric heaters, unless designed for the purpose, should not be covered directly with airing clothes? Or that oily rags or rags soaked in paint are liable to self ignition? All the accidents against which this little book warns us have happened, and though they are hair raising, everybody old enough to understand the meaning of the words should read about them

In this country we are particularly exposed to risks from electricity and gas because heating devices of either kind are nearly always sold without guards, and because in place of the central light and fixed hearth of former days we now have homes draped with festoons of flex or lengths of dangerous rubber tubing, and carry unguarded fires from place to place Sweden, Denmark, and some other places have already taken precautions against such risks In Sweden, for instance, no electric fire can be sold which does not bear an "S" mark, meaning that it has been passed as safe by an organisation called SEMKO—"safe" here meaning free from risk as regards thermal injury as well as from electrical hazards This is a company jointly owned by the united electrical power companies, the united electrical industries, and an association for preventing accidents by fire This company pays no dividends, but is maintained by the small charge made for examining and passing electrical appliances The charge is so small that it does not affect the market price of the goods The government requires that all electrical appliances should bear the SEMKO mark, but otherwise does not interfere The death rate from burns in Sweden is about 10 per million population, compared with our 21 The Danes use district heating extensively, and also prohibit the sale of unguarded electric fires English fires exported to Iceland must carry a guard which complies with the safety regulations so we are in the strange position of manufacturing safer fires for Icelanders than for ourselves

The British Standards Institution has been considering safety specifications for electric fires for over three years it produced draft specifications nearly a year ago, but has not yet issued a report Meanwhile, though some of the chief manufacturers have produced satisfactory designs, they are not willing to put them on the market until they see the final specifications of the B.S.I. Electrical manufacturers are the more inclined to hang back because the gas industry has produced no specifications at all Manufacturers of open fires, however, have recently been considering ways of improving the design of fireguards

Another approach to fire prevention, and especially prevention of burns, would be by way of fire proofing clothing materials, and in particular raised cotton fabrics These fabrics, it is thought, are probably responsible for a very large proportion of burns in the home Among the first 1000 admissions to the burns unit at the Birmingham Accident Hospital it was found that 3[illegible] of domestic burns were due to clothing catching alight and 88% of all the deaths from burns were due to this cause Dr Leonard Colebrook, F R S, to whom we are indebted for many of these facts, is at present sending samples of clothing worn at the time of such accidents, for examination by a textile expert His reports show that among the 32 samples of clothing (from 24 burned people) so far examined, 20 were of cotton, 7 of viscose rayon, 2 of cotton mixed with viscose rayon, 1 of cotton mixed with wool, and 2 only of wool The two woollen garments came from people who were also wearing cotton Some new methods of fireproofing materials have lately been reported from America If one or more of these should prove suitable in every respect but the cost Dr Colebrook suggests that, in view of the high cost of burns injuries to the country, there would be a strong case for subsidising the cotton industry to fireproof fabrics sold

1. Fire! Fire! H.M. Stationery Office 1950 Pp 16 3d

THE RHONDDA FACH SCHEME

this scheme, announced to the press on July 31, ıeumoconiosis Research Unit (P R U) of the Medical rch Council is turning its attention to the problem berculous infection in coalminers with pneumo sis In essence the idea is simple but ambitious o radiograph a complete community of some 30 000 mining valley The non miners will be examined he mass miniature radiography unit of the Welsh onal Hospital Board, and the miners with full size by the mobile X ray unit of the P R U The ne is being locally controlled by an advisory com ee, with Dr Norman Tattersall as chairman and is the blessing of the Ministry of Health Made ible by coöperation of various medical authorities, the concentration of their work in one limited area, scheme will be carried out without any increase in the get of the organisations concerned Its three main s are

To reduce the number of sputum positive tuberculous cases in this one area by means of universal radiography followed by admission of suitable cases to hospital, and by health visiting to instruct the remainder in sputum control

To study the effect of this reduction of infectivity on the tuberculin sensitivity of school-children and the attack rate of tuberculosis of all forms in the community

If a considerable reduction of tuberculous infectivity is achieved, to study the attack rate of massive fibrosis among miners already affected by simple pneumoconiosis which is widely believed to be a modified form of tuberculosis [1 2]

everal points of interest arise Mass radiography has ıerto had as its chief objective the diagnosis of ıerculosis at an early stage so that prompt treatment be provided Because of the absence of satisfactory dence that treatment significantly affects the prognosis these early lesions, it is questionable whether this uld have been its main objective In the Rhondda h scheme the therapeutic aim, while not abandoned, been subordinated to a prophylactic aim The main ective is to prevent the appearance of new cases of ıerculosis

Some of the finer details deserve comment The most portant decision has been to aim at examining 100% the population In two surveys at mines carried out Dr A. L Cochrane, of the P R U , every one of the derground workers was persuaded to volunteer for hography In both these surveys it was found that ere was a higher proportion of clinically significant berculosis in those who were the last to come forward be examined than among the earlier volunteers This ggests that present mass radiography studies, in which little as 20% of the population may volunteer, are ssing many more cases than the sponsors recognise ie decision to use full size films for miners is based a trial of various miniature radiographic techniques, ne of which was found capable of revealing early eumoconiosis This is of interest since large numbers miners in this country are still being radiographed with mm films, with inevitably misleading results The ual technique of reading small films will be modified the light of the work of Yerushalmy and others in nerica [3] Three doctors will read all the small films lependently, and large films will be taken of all those ıd as clinically significant tuberculosis by any of the ree The large films will be read in triplicate in the ne way, and any case read as clinically significant berculosis by any of them will be clinically investigated is probable that these triplicate readings will greatly rease the efficiency of case-finding

This pioneer study in the epidemiology of tuberculosis l also be used to investigate the ætiology of the most serious form of coalminers' pneumoconiosis If the follow up shows that the attack rate of massive fibrosis among cases of simple pneumoconiosis is much decreased it may show one way in which medical supervision may combine with dust prevention to reduce the serious incidence of disabling pneumoconiosis among coal miners The results of this part of the inquiry will of course, depend on whether massive fibrosis is of tuberculous origin, and, if so, whether it is due to endogenous or exogenous infection

Bough, J Occup Med 1947, 4 86
Fletcher, C M. Brit med J 1948 1, 1065
Yerushalmy J Harkness J T Cope J M. Kennedy B Amer Rev Tuberc. 1950 61, 443

PAY OF THE PSYCHIATRIC SOCIAL WORKER

QUALIFICATIONS lose their value when they become common currency "when everyone is somebody then no one's anybody" But when those who hold a particular qualification are few, and the openings for their services many, they naturally acquire a scarcity value which people with appointments to offer generally recognise in a practical manner Psychiatric social workers, who are both scarce and highly trained, have lately suffered a curious affront in an advertisement (reproduced in full by Dr Sessions Hodge in his letter on p 271) which asks for applications for the post of mental health worker, and offers higher remuneration to "unqualified persons" Even after five years the qualified psychiatric worker is to get less than the starting salary of a woman without this qualification

Whatever may be said against the tact displayed in the wording of this advertisment, we can all be grateful to the drafter for bringing an injustice into sharp relief Psychiatric social workers normally hold a social science diploma or degree, which means two or three years at a university, followed, after a period of practical experience by a further year's study at a university for a mental health certificate but they are paid on a scale of £370–530 negotiated between voluntary hospitals and medical auxiliaries before the National Health Service started. This scale should have been revised long ago, but the Whitley Council has been unaccountably slow in reaching agreement Because psychiatric social workers are scarce Nottinghamshire has thrown the posts open to other mental health workers These are mostly ordinary social workers—some of them holding a social science diploma—who will receive their mental health training "on the job" These workers were not tied down by a previous agreement and have acted through their association, with the result that the Whitley Council machinery has been used on their behalf The Nottingham County Council have graded the post as that of a senior social worker and are offering the A P T IV (administrative, professional, and technical) scale of the National Joint Council for employees of local authorities —i e £480–525 The advertisement, however, lumps together the psychiatric social workers and the social workers holding a diploma in social science, and awards them the inferior scale which applies only to the psychiatric social worker (though she holds an additional qualification) In the next sentence it refers to "unqualified persons" when it really means social workers not holding either the diploma or the mental health certificate

The psychiatric social workers undoubtedly have been, and are being penalised by the slowness of their negotiations To complete a paradoxical story, the Ministry of Health, having appointed a committee to inquire into the causes for the scarcity of these workers, has not so far published its interim report submitted a year ago Meanwhile this rare and valuable bird will probably become rarer, if not extinct As Gilbert might have put it, "when somebody is nobody, there won't be anybody"

Prof JEAN VERHOOGEN, of Brussels, for many years chairman of the international committee of the Société Internationale de Chirurgie, died on July 24 at the age of 86 He was an honorary fellow of the Royal College of Surgeons of Edinburgh

BRITISH MEDICAL ASSOCIATION

Scientific Sections

ORTHOPÆDICS

President Mr B L McFARLAND

Tuberculous Arthritis of the Hip joint

Mr H J SEDDON said that it was now generally accepted that sound arthrodesis in the optimum position should be secured after the disease had become quiescent, and that some type of grafting operation based on the work of Trumble and of Brittain was perhaps the best means of obtaining it There was general disquiet, however, about the side effects of the long continued immobilisation in recumbency which H O Thomas and his pupils had insisted was necessary to obtain quiescence The renal lesions were well known, but demineralisation of the skeleton was common, the thoracic cage often altered in shape, and premature fusion of the epiphyses above and below the knee could lead to gross shortening Much of this could be avoided by applying the mobile suspension apparatus developed by E J Nangle and others, but the disadvantage of a fixed hip joint would remain Until the advent of streptomycin the prospects of obtaining useful movement had been poor For the badly damaged joint, Bankart's radical excision was seldom required, and Adam Gruca of Warsaw was perhaps alone in advocating a type of arthroplasty as a routine procedure With streptomycin, which gave some hope of retaining the normal mechanism of the joint, early diagnosis and pathological proof were essential Biopsy of an iliac gland was still a useful diagnostic procedure, but arthrotomy to obtain a specimen of synovial membrane now carried fewer risks and should not be delayed in cases of doubt

Mr R S GARDEN spoke about the difficulties of early diagnosis If a child's limp persisted after a week in bed complete investigation was warranted. An early sign of muscle spasm was loss of rotation movement, which could easily be detected with the child lying down by flexing both hip and knee to a right angle and using the lower leg as a pointer

Mr DILWYN EVANS described with reserve the promising results obtained with streptomycin in the treatment of early cases in the South Wales area It was still much too soon to arrive at any definite conclusions, but the results to date justified some degree of optimism There had been few side effects from the standard dosage of 1 g daily for 90 days Mr E WARDLE discussed the surgical treatment In 27 out of 34 cases he had obtained sound arthrodesis from an iliofemoral graft placed just above the neck of the femur, and he thought this a better procedure in children than Brittain's operation Dr J DOBSON read a fascinating paper giving an analysis of 320 cases treated by a variety of methods A high proportion of patients discharged with fibrous ankylosis returned with sequelæ needing further hospital treatment, this was rare when bony ankylosis had been secured He regarded Brittain's operation as a good one in children (an opinion which was shared by several other speakers) The human type of bacillus had been found in every case (68) investigated from this aspect The average period before the diagnosis was made was ten months

In the discussion which followed, Mr NORMAN CAPENER recalled the work of Blundell Jones on the persistence of streptomycin injected into the knee joint Appreciable concentrations remained for as long as four weeks—a finding which suggested that intra articular injections of streptomycin at intervals of one or two weeks might be a rational adjunct to the systemic therapy, especially for the early synovial type of lesion The PRESIDENT emphasised the value of osteotomy with inward displacement in the operative technique of arthrodesis, regarded this as a most important reason for the success of Brittain's procedure

Treatment of the Short Leg

Mr G E THOMAS reviewed the numerous methods of leg equalisation, varying from alteration of the heel of a shoe to amputation and an artificial limb With regard to conservative measures he recalled that the Of extension type of boot had been demonstrated at a meeting of the B M.A in 1899, and was still a useful appliance, particularly for men with shortening of 4½ inches With tibial lengthening he had often seen degenerative changes in the ankle joint from the pressures developed by distraction, elongation of the Achilles tendon left many soft tissues to be stretched and fresh deformities in the foot could follow, the lower fibular fragment carrying the lateral malleolus was often pulled upwards Various methods of epiphysis in children, such as lumbar sympathectomy, epiphysiodesis, stapling of epiphyses, and shortening of the sound limb were fully discussed

Mr F G ALLAN reported his experience of 101 cases of leg lengthening, 54 of the tibia and 47 of the femur Tibial lengthening was used chiefly for infantile paralysis (30 cases), and femoral lengthening for the short leg secondary to tuberculosis of the hip (18 cases) The average increase in length obtained from the tibia was just over 2 inches, and from the femur just under 2 inches Provided there had been minimal interference with the soft tissues during the operation for division of the bone, care during the stage of distraction could avoid most of the complications mentioned by various writers

Mr A L EYRE BROOK discussed the techniques of bone shortening, either by arrest of epiphysial growth or by shortening of the femur or tibia The use of staples across the epiphysial line on either side of the femoral or tibial condyles to control bone growth was still an experimental procedure, though it was giving encouraging results For stopping epiphysial growth altogether, he preferred a much more extensive curettage of the cartilaginous plate than was generally recommended, bony closure of the epiphysial line should be visible in three months In the older age groups bone shortening was simple, safe, and exact For the femur straightforward overlap of the bone ends with transfixing screws could be used, but in the subtrochanteric region a Blount plate gave good fixation

In the discussion which followed Mr SEDDON commented that leg equalisation was a procedure best left to one surgeon in each area Mr H OSMOND CLARKE asked that surgeons should temper their enthusiasm for bone shortening in men when the consequent height would approach five feet six inches He also mentioned Swedish work on the production of arteriovenous aneurysm to stimulate bone growth in the lower limb.

Treatment of Acute Osteomyelitis

Prof W MERCER said that the main problems in the treatment of osteomyelitis at present were those of early diagnosis, the best use of penicillin and other antibiotics, and the type of surgery to be recommended, if any, In his experience penicillin at a constant blood level of 0 1 unit per ml often sufficed up to the age of 5, from 5 till 10 years surgical treatment was often indicated but over 10 years it was always required He suspected insensitivity to penicillin in 5% of cases, and stressed the need for the appropriate tests in all cases The surgical technique to be employed could not be laid down, his own preference was for incision, drilling

ne, the local application of penicillin, suture in yers, and splintage in plaster of paris

ı Dislocations

OSMOND CLARKE related a number of examples of ıtion, torn ligament, or displacement of bone into , any of which might not be recognised by ordinary ıl or radiographic examinations Subluxation of ervical vertebræ was often missed on account of ɔ to take films with the neck flexed Complete of the internal lateral ligament of the knee or of ·ternal lateral ligament of the ankle usually required taken with firm strain on the ligament for their ·ecognition Displacement of the medial epicondyle ɔ humerus into the elbow joint was often overlooked ın the presence of damage to the ulnar nerve He ·ed that the completely torn internal lateral ligament ıe knee should be carefully exposed and lightly ·ed before fixation of the joint in plaster, on the hand the conservative treatment of the torn nal lateral ligament of the ankle rarely left any ıs instability

acondylar Fractures of the Humerus

F W HOLDSWORTH discussed the treatment of acondylar fractures in children The results of all s of operative reduction were uniformly bad, but ated manipulations to improve the reduction were much better The bone ends were often thin plates the edges of a broken dish, and impossible to hold tly reduced In a recent review of 45 cases with primary displacement examined after three or more ·s, he had found all the parents satisfied and little lence of impaired function in the elbow in any case treatment of the fracture the arm should be supported ı simple collar and-cuff sling at 45° flexion of the ·w, he was averse to any form of plaster cast

·rtrochanteric Fractures of the Femur

Ir NORMAN ROBERTS reported the results in 50 cases ıtertrochanteric fracture of the femur treated in the six years, the average age being 62 Of the 48 cases ·ed, 35 had been treated by fixation with a tri fin nail . plate, complete technical success was achieved in and 8 cases were regarded as partial failures for ıous reasons There was no operative mortality Roberts thought that internal fixation was a ıcedure of undoubted value in selected cases

OCCUPATIONAL HEALTH

President Dr DONALD HUNTER

ganic Phosphorus Insecticides

Dr LESLEY BIDSTRUP said that the Germans developed ·erful organic phosphorus insecticides during the 39–45 war, to protect their limited food supplies Both U S.A and Great Britain have made use of these ɔpounds, which can be lethal to man as well as to red spider and aphides 'Parathion' is the most ıonable because, unlike H.E T P (hexa ethyl tetra ·sphate) and T.E.P P (tetra ethyl pyrophosphate), it table and gives longer protection to the plant These ·ipounds are toxic because they inhibit the enzyme ı linesterase

Dr F A DENZ explained their mode of action ·tylcholine is normally liberated at the parasympa tic nerve-endings and at the myoneural junctions s rapidly hydrolysed in the presence of cholinesterase this enzyme is destroyed, acetylcholine persists ·ducing the muscarinic effects—flooding of saliva, lding of tears, intestinal colic, and bronchospasm ·se symptoms are relieved by atropine

r BIDSTRUP emphasised another danger of parathion ·oning is insidious and miosis develops at a late stage h T.E P.P and H E T P, on the other hand, constriction the pupils occurs early so the victim is forced to give up his work because he cannot see properly Early treatment with atropine, gr $^1/_{60}$–$^1/_{30}$ repeated hourly until the pupils are dilated or pulmonary œdema has subsided, is essential The combination between cholin esterase and parathion is irreversible after a few hours Restoration of cholinesterase can only take place by regeneration after weeks or months The muscular paralyses are the danger signals and are unaffected by atropine, but prolonged artificial respiration can save life In factory and field, absorption of parathion through the skin and by inhalation could be prevented, but reliable protection is so elaborate that parathion users must be closely supervised

There was force and a welcome objectivity behind this paper, but Dr MAURICE GOLDBLATT, commenting on its restrained tones, said there is full justification for more violence As time goes on, these insecticides with their incomparable properties of destruction will be applied in greater measure Education of users is an arduous task but should be pursued, since proposals to ban sales of these insecticides are not likely to be acceptable in view of their importance to agriculture and horticulture

Prof R E LANE suggested issuing to everyone exposed a card describing the signs, symptoms, and treatment of parathion poisoning This could be handed to the doctor, who might be ignorant of the nature and the treatment of such a bizarre illness A similar procedure was adopted many years ago by the Factory Department for industrial anthrax

Dr ALAN DAVID summarised the principles of control as training and education, the provision of protective clothing, of gas proof cabs for drivers who are spraying, and of supplies of atropine in sealed containers for those at risk, and routine medical examinations, including estimations of cholinesterase in blood and plasma Finally, Dr LESLIE NORMAN recommended that the Ministry of Health should be asked to inform all medical practitioners in rural areas about this toxic hazard, for which there is an antidote

All agreed that here is a new danger to the peaceful inhabitants of rural England, and that the Government, industry, and doctors should take warning from the 100 cases of poisoning recorded in the U S.A in 1949

Medical Examination in Industry

The second session was more controversial Dr A THELWALL JONES shattered the well-established beliefs of industrial medical officers by suggesting that the pre-employment and periodical medical examinations were hardly worth while He argued that in most industries the labour turnover is so high that the value of the pre employment examination is lost The usual conditions leading to rejection can be observed by a competent labour officer The examination at regular intervals of men working on hazardous processes rarely detects disease, and the periodic health 'check up" should be condemned To advocate it is to deceive the patient and the doctor, serious disease could develop within a month or two after a satisfactory medical examination As an alternative, industry should develop the principle of voluntary consultation for all workers and not encourage its doctors to become preoccupied with job analysis and statistics Dr R F L LOGAN described Dr Thelwall Jones's remarks as a healthy tornado Present methods are out of date and relics of the times when many young persons with gross disease applied for work Today the few who are obviously unfit for industrial work are screened off by the school medical service, and yet the same type of medical examination is continued in industry

Dr NORMAN said that it was not antisocial to advise a worker against taking a job for which he was ill-suited to allow a tall man to become a bus conductor would

make him liable to an occupational kyphosis and constant irritation, he would avoid his duties on the upper deck and become inefficient Rather should there be a Society for the Prevention of Cruelty to Workers to protest against such misemployment Medical examinations are of service to the group as well as the individual Misfits at work are a source of danger to other workers and to the public One of the main points of advance in medicine may well be the detection of the subhealthy by periodical examinations, bringing to them early treatment before disease has developed

The opinions of the majority, expressed by Dr LLOYD POTTER, was that Dr Thelwall Jones had not appreciated that a good clinician could be a practitioner of preventive medicine To wait for the worker to consult the doctor might be to wait in vain Professor LANE, supported by Dr A J ORENSTEIN, said that medical examinations are essential in hazardous occupations, and give confidence and comfort to those exposed It is a pity that they are not extended to all the dangerous trades

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Dr FREDERICK HALL urged better training of the undergraduate in a knowledge of the organised health services provided by local authorities and of the environmental and social influences which played so important a part in the physical and mental conditions which the family doctor was expected to treat Dr J D KERSHAW spoke of the need for study of social factors not only in relation to disease but as an essential preliminary to the provision of an optimum environment in which man can realise his full potentialities A new concept of social medicine might be obtained by thinking of 'dis ease" in the literal sense as a "disturbance of ease," and of the patient as a person whose mode of life and success in living were threatened Surgeon Rear-Admiral Sir SHELDON DUDLEY, F R S, favoured a salaried service not depending on the number of sick treated "we shall do nothing in the National Health Service till we a salaried service"

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Dr C FRASER BROCKINGTON spoke of a community relationship similar but distinct from doctor patient relationship of the family and doctor Areas should not be too large for the officer of health to make an intimate study of community health problems in his district—a population might not exceed say 100,000-150,000 Dr Brockington's opinion he should be given bility for the industrial health service in his area close cooperation needed locally between the the hospital, and the general practitioner, had poignantly demonstrated in the Radcliffe survey which showed that owing to lack of an system of follow-up 75% of the patients failed to fully from hospital care The practice of public required full specialist recognition He would like the introduction of a registrar grading in public training, and, after the present twelve month for the D P H, a year spent in the academic study social medicine followed by a year's study of the services abroad before entering the community services in this country Speaking of the work of health visitor, he argued that the balance of training now wrong Two years' basic nursing was enough, training in the social sciences needed to be extended at least two years

Dr J GREENWOOD WILSON thought there was much wrong with the present training of the visitor, who in Cardiff, since 1944, had become addition to her other duties, the key worker in a home follow-up scheme, now provided for in the care aftercare provisions of section 28 under the National Health Service Act The health visitor knew her family and was in a unique position to coöperate with family doctor in securing necessary help when patients come out of hospital In this way the health visitor save the doctor's time in much unnecessary detail advice and by supplementing his lines of communication with the hospital service—particularly with the hospital almoner

Dr E HUGHES doubted whether we knew under which administration the future of social medicine would work to best advantage All parts of the National Health Service Act, he thought, required to be administered by a single ad hoc body The wide scope for the practice of social medicine under the National Assistance should not be lost sight of, nor the part the medical should play in an industrial health service The health visitor was a technical officer whose training need necessarily be extended in the sphere of social work Dr B G GRETTON-WATSON referred to the mounting costs and growing complexity of the curative service He deplored the passing over of the chest clinic to the hospital service while local authority services were what were in effect an extramural extension of curative and rehabilitative activities of the hospital Prevention had been forced into the background a revival was assured Not until it became known to prevent the many diseases now filling our hospitals would the real purpose of social medicine be achieved

Care of the Tuberculosis Patient in the Home

At a joint meeting with the section of diseases of chest and tuberculosis Prof F R G HEAF said owing to the lack of sanatorium beds, 137,000 tuberculous patients were having to be treated in their homes Patients whose homes were poor should, he thought have priority for admission to sanatoria D patients must be free from financial anxiety, cooperative and with proper opportunities for rest Complicated must be treated in hospital, and collapse therapy

ome should be used with care Streptomycin not be given indiscriminately, because of the of spreading resistant organisms He suggested general practitioners should consult the chest ian before giving streptomycin to their patients cts should be examined and children who were ux negative should be given B C C

R GRENVILLE MATHERS regarded the chest clinic e chief centre for the treatment of tuberculosis allasey he said cases suitable for active treatment selected for admission to sanatorium for collapse py, and as soon as this was established they were arged to continue treatment at home Mothers housewives were unsuitable for domiciliary care needed home helps and sometimes could not l them Of the children referred to the clinic in irea 65% had had no known contact with a recog case of tuberculosis the unknown case was the er Dr W D GRAY said that of 140 adult patients ting admission to hospital in the North Liverpool 82 were able to rest in bed in a single room 5 had nare a room with others, 35 were unable to rest, 28 were unwilling

the discussion which followed Dr GREENWOOD SON advocated free home helps for the tuberculous

DERMATOLOGY

President Mr R STOPFORD TAYLOR

motherapy of Venereal Diseases its Uses and Abuses

Dr ROBERT LEES advocated the use of penicillin and phonamides in gonorrhœa but added that reliable s to establish diagnosis and cure are essential He fers streptomycin if coincident syphilis is suspected erdosage with penicillin may conceal syphilis Empiri treatment and neglect of ancillary treatment are amon abuses and he considers that the use of penicillin mouth to prevent venereal disease is an abuse In ly syphilis penicillin alone may be curative, he said, the amount of drug and the duration of adminis tion required are still unknown It is common practice combine the use of penicillin, bismuth, and arsphen- mines He suggested a treatment schedule in two phases very intensive attack lasting 2–3 weeks, with penicillin, muth, and arsphenamine, and (*b*) a prolonged phase g, 6 months), in which arsenicals and bismuth are en but not intensively The place of penicillin in treatment of late syphilis is still unsettled but it very valuable in syphilis of the central nervous system l may be useful in cardiovascular lesions, provided it used cautiously and the patient is properly prepared slow acting drugs Congenital syphilis can be prevented npletely by antenatal treatment, which should consist penicillin and bismuth, but not arsenicals special hnique is needed for lesions such as interstitial atitis In the treatment of syphilis the abuses are overdosage especially in congenital syphilis and nt cases with "fixed" positive serum reactions under treatment of early syphilis (a few doses of icillin being given, often without established diag is) (3) local applications of penicillin, and (4) itment of healthy persons wrongly suspected of hilis

Dr SYDNEY M LAIRD said that chemotherapy repre s a fundamental advance over the symptomatic tments of earlier centuries The principles of usage, h are essentially the same, irrespective of the notherapeutic drug given, should be clearly under- d and failure to observe these principles constitutes se of chemotherapy Three important factors are virulence of the organism, the natural defensive ers of the patient, and the efficacy of the drug last depends on the sensitivity of the pathogenic nism and the tissue level of the drug which can be established at the site of infection The combined use of chemotherapeutic agents may sometimes be advantageous Accurate bacteriological diagnosis before treatment, and adequate post treatment observation, are essential One injection of penicillin is usually adequate for an uncomplicated gonorrhœal infection In complicated cases longer chemotherapy and local treatment may be required Penicillin has established its place in the treatment of all stages of syphilis and with few exceptions should replace the arsphenamines Bismuth compounds should be combined with it in all stages In late syphilis bismuth should precede penicillin, to reduce the risk of Herxheimer reaction and therapeutic paradox

Dr D J CAMPBELL said that treatment with early preparations of penicillin, and less than 150,000 units, had given a high and immediate cure rate for gonorrhœa in males He preferred the oily preparations, but modern syringes make them somewhat unmanageable He thought this relatively small dosage desirable because it is less likely than a larger dose to mask incubating syphilis Alternatively dosage should be increased so much as to make certain of eradicating any possible syphilis He regards penicillin as the drug of choice in early syphilis and agreed with Dr Lees on the treatment of late syphilis Dr D I WILLIAMS discussed the place of dimercaprol (BAL) in the treatment of metallic intoxications and thought it should be employed in all but the mildest cases of arsenical dermatitis Colonel CLIFFORD MORGAN (U S Army) spoke of the help the Central Guidance Bureau has given in reducing the incidence of venereal disease in the Forces Dr DONALD HUGGINS (Trinidad) discussed the necessity for an effective short course for the treatment of early syphilis in the West Indies Dr A M STUART stressed the need to treat the wife, without necessarily waiting for positive laboratory findings, when the husband is known to be infected with gonorrhœa

Dr J P G ROGERSON spoke of the importance of the small communities—e g, 10 000 persons—and the difficulty of attendance at clinics more often than once a week because of distance and transport

A discussion on *Parasitology in Relation to Dermatology*, held jointly with the section of tropical medicine, was reported on July 29 (p 185)

ANÆSTHETICS

President Dr KATHERINE LLOYD-WILLIAMS

Applied Pharmacology in Anæsthesia for Abdominal Operations

Dr STUART C CULLEN (Iowa City, U S A) described a method of anæsthesia with several drugs in which each component contributed special virtues Nitrous oxide was the essential anæsthetic, the rest being used either to allow sufficient oxygen to be administered with the nitrous oxide or to provide muscular relaxation Reflex irritability and metabolic activity were first depressed with such drugs as the barbiturates, morphine or its substitutes, scopolamine, or bromethol ('Avertin') In premedication he favoured morphine and scopolamine rather than pethidine, which produced little psychic effect Induction was with thiopentone and anæsthesia was maintained with nitrous oxide administered by the semi closed carbon dioxide absorption method Pethidine was injected intravenously in repeated doses, and curare was added to produce relaxation The patient was intubated Care was necessary during his recovery if large doses of depressants had been given

Dr WILLIAM MUSHIN had found that this technique gave good results in terms of rapid recovery, freedom from sickness, residual analgesia, flexibility, good operating conditions, and absence of explosion risk.

make him liable to an occupational kyphosis and constant irritation, he would avoid his duties on the upper deck and become inefficient Rather should there be a Society for the Prevention of Cruelty to Workers to protest against such misemployment Medical examinations are of service to the group as well as the individual Misfits at work are a source of danger to other workers and to the public One of the main points of advance in medicine may well be the detection of the subhealthy by periodical examinations, bringing to them early treatment before disease has developed

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GRAY referred to the noradrenaline secretion by amours, and thought that the adrenaline secreted luced by the anæsthetic He suggested the treat might be to inject more adrenaline Dr A C STER described 8 cases of these tumours, the pressure always fell, he said, when the clamp was , but it was readily controlled with an injection naline Dr F L DYSON advised a trial of drugs Dibenamine' and 'M & B 933F' in these cases

NEUROLOGY

President SIR HUGH CAIRNS

nent of Parkinsonism

HUGH GARLAND said that whatever the lying cause, parkinsonism always appeared to from destruction of ganglion cells in the extra aidal system The commonest form was paralysis as, underlying which there was probably an rtant genetic factor, the second commonest cause encephalitis lethargica All other causes were rare Parkinsonism might make a dramatic arance following sudden emotional shock Usually disorder was progressive, but about 30% of the post phalitic cases appeared to be stationary In a ey of about half a million people he found the lence of parkinsonism to be not less than 1 in 1700, e would therefore appear to be at least 27,000 sufferers Great Britain Drugs of the solanaceous group had n used for 80 years, but in massive dosage only since Many new drugs, mostly under proprietary ies, had been used in the past four years All drugs to be taken continuously, and usually in maximal age The newer drugs might act more quickly than older, but there was not much evidence that they e really more effective It was very difficult to assess value of drugs because of the very important psycho cal factors in any form of treatment Oculogyric es did not respond to drugs but might improve after troconvulsive therapy All forms of surgical treat it so far suggested were themselves destructive, and relief of one disability might be followed by a new bility which was worse

Dr GEORGE SMYTH said the outlook was better in the tencephalitic case He underlined the pre eminent portance of psychological management and of physio rapy He agreed that there was not much evidence t the new drugs were more effective than the old did not, however, feel that the future of drug atment was necessarily hopeless

Dr DENIS LEIGH spoke of the difficulty in assessing the ue of drugs, because of the psychological factors l he drew a comparison with ulcerative colitis and umatoid arthritis The best results at present were ng claimed for the French preparation, 'Lysivane' had used various drugs, employing electromyographic l other controls Even though the measurable results re usually poor, the subjective results were frequently d He doubted whether parkinsonism occurred only those of a certain personality, but he emphasised the portant effect of the disease on the personality, the ient finding himself isolated in a constricting world, sudden change in which assumed gigantic propor- ns He mentioned the fluctuating response to various gs, and he, too, doubted whether the new drugs were ter than the old Though the differences were slight, put the drugs in the following order of efficacy tane,' 'Parpanit,' 'Benadryl,' stramonium, ephorin,' and hyoscine

Mr GEOFFREY JEFFERSON, F R S, said that no operation cured this disease, and a lot of the press publicity ting to surgery had been irresponsible Surgical edures were not difficult, and in any event British rosurgeons were the most competent in the world said the desiderata for surgery should be (1) uni lateral involvement, not progressive or only very slowly progressive, (2) tremor the chief feature, the tremor being incapacitating, and (3) the patient's age not more than 50 or at the most 55 years Such criteria would exclude 95% of all parkinsonians Section of the cervical cord was the simplest procedure Perhaps the best operation was division of the propyramidal fibres in the anterior limb of the internal capsule

Sir HENRY COHEN said that some postencephalitic cases derived benefit from the solanaceous drugs for many years They became liable to chronic glaucoma, and the use of eserine was essential He referred to our lack of knowledge of the underlying mechanisms of tremor He thought that progression of postencephalitic parkinsonism might be due to chronic and relapsing encephalitis He found it difficult to differentiate the ætiological factors

At another meeting Dr M J McARDLE opened a discussion on pain in the upper limb

Public Health

Q FEVER IN NORTH WALES

J FORBES
M D Lond, M R C P
PHYSICIAN TO THE WREXHAM HOSPITALS

THE following case of Q fever is reported because the disease has not so far been described in this part of the United Kingdom, though there have been small outbreaks and sporadic cases in southern England (Stoker 1949, MacCallum et al 1949) The rapid response to 'Aureomycin' is in consonance with previous experience (Lennette et al 1948, Hauss and Simrock 1949)

CASE RECORD

A man, aged 31, engaged in exploratory boring for opencast coal sites was admitted to the Maelor General Hospital, Wrexham, on March 14 1950 For the previous month he had been working on farmland in Flintshire On March 10 he developed a cough pain in the chest and severe headache His family doctor treated him with sulphonamides and penicillin but as his condition worsened sent him into hospital

On admission his temperature was 101 5°F Physical examination revealed consolidation in the mid zone of the right lung and a pleural rub Radiography showed extensive pneumonic consolidation of the right upper and middle lobes The sputum, which was small in amount contained staphylococci non hæmolytic streptococci, and *Monilia albicans*, but no pneumococci or tubercle bacilli

Treatment with 'Sulphatriad and penicillin was continued for three days without effect, the patient remained very ill, with a sustained temperature of 100°–102°F occasional delirium, and constant complaint of severe headache The headache absence of pneumococci from the sputum, and failure to respond to sulphonamides and penicillin suggested that the condition was virus pneumonia, or possibly Q fever Accordingly, on March 18 treatment with aureomycin (500 mg six hourly by mouth) was begun and a sample of blood was taken for complement-fixation tests against *Rickettsia burneti* and the viruses of influenza and psittacosis

The response to aureomycin was immediate and dramatic, great clinical improvement being apparent within 24 hours and the temperature falling to normal in 48 hours Aureomycin was continued for seven days, the total dosage being 14 25 g Serial X rays showed progressive clearing of the lung lesion, which had almost disappeared by March 27 Convalescence was uneventful and the patient was discharged to his home on the 31st On April 4 the patient reported himself completely well, and an X ray film of his chest showed normal lungs

The complement-fixation titres for Q fever were March 17 (7th day from onset) 1/8 April 13 (34th day), 1/256, and May 30 (81st day) 1/512 The rising titres clearly indicate an infection with *R burneti* Complement-fixation tests for psittacosis and influenza A and B and agglutination tests for streptococcus M G were negative Cold agglutinins were absent on March 17 and again on April 1

It has not so far been possible to trace the source of infection The patient's fellow workmen, and the farmer

Dr T C GRAY mentioned that ether in small doses was also an effective analgesic, and Dr R F WOOLMER doubted whether there was any advantage in using more than 20% oxygen

Resuscitation of the Newborn

Dr G S W ORGANE described the breathing movements which start long before birth During labour, he said, most of the liquor was squeezed out of the respiratory tract, and failure to breathe at birth was due to depression of the respiratory centre from such causes as anoxia or anæsthesia The baby should be placed head downwards, and must be well wrapped up His pharynx was cleared, and his back rubbed to stimulate breathing Oxygen was administered and a tracheal tube was kept ready In white asphyxia Dr Organe never used transfusion or circulatory stimulants

Dr R J MINNITT quoted figures based on 2500 labours at the Liverpool Maternity Hospital during 1949 Where the mother had received gas and air analgesia alone no resuscitation of the babies had been necessary, but when a number of analgesic drugs had been used the proportion of resuscitations was high During cæsarean section the quicker the baby was delivered after the anæsthetic had been started the less was the likelihood that resuscitation would be needed Lobeline and oxygen were the commonest methods used

Dr W N LEAK, however, strongly advocated stimulants, especially a mixture of leptazol and ephedrine Dr E H WINTERBOTTOM advocated squeezing of the tendo achillis, and Dr J DUNDEE used carbon dioxide Dr GRACE EVANS had used trichlorethylene with little ill effect, but Dr J R GREGORY (Kenya) had found that his infant mortality had risen with the use of trichlorethylene he strongly advised the use of chloroform

Anæsthesia in the Newborn

Dr T N P WILTON discussed techniques used for thoracotomy in newborn infants, most of them being cases of œsophageal atresia They were puny children, often premature pulmonary infection or atelectasis were often already present An intravenous infusion of blood or dilute saline was continued during and after operation A small dose of atropine was given, and anæsthesia was induced with ethyl chloride and open oxygen and ether, the cords were sprayed with ametho caine and the larynx intubated Oxygen and ether continued the anæsthetic, with the addition of vinyl ether if extra relaxation was needed The respiration was controlled, for the child was easily made apnœic Suction was used to keep the respiratory tract clear Patients were placed in the lateral position on the table and were watched throughout the operation for signs of collapse of the contralateral lung The chest was drained with an underwater seal At the end of the operation the trachea was cleared by suction, through a bronchoscope if necessary Dr Wilton described an endotracheal connector with valve fixed on it, which reduces the dead space of the apparatus

Dr G JACKSON REES noted that in the newborn infant, as compared with the adult, thoracic respiration was less important, since the ribs were disposed horizontally and the lung was relatively inefficient, since the area available for respiratory exchange was small, but to compensate for these deficiencies, the infant had a rapid respiratory rate Since the trachea was relatively narrower than in the adult, resistance to breathing was increased in greater proportion if respiration became rapid Deep levels of anæsthesia were unnecessary and so was curare, because muscle tone was virtually non existent He held that cyclopropane was contra indicated in these patients, the best anæsthetic being ether—provided that the respiratory effect was reduced by controlled respiration The child was given atropine and brought to the theatre in a gamgee jacket intravenous drip running into the leg Those who were cyanosed were in an oxygen tent A was induced with nitrous oxide and oxygen and given under a Schimmelbusch mask. After the tube was connected to an Ayre's T piece, trolled respiration was used throughout the At intervals the ether vapour was turned off movement returned to the limbs This ensured anæsthesia and recovery after operation

Dr GRAY had used curare safely in these very small doses Mr DENIS BROWNE held that shock in these cases was due to deep anæsthesia must learn to operate with the child under thesia, even perhaps moving Dr MUSHIN against the risks of overdosing with atropine, increasing dead space or resistance to breathing unsuitable apparatus, and also of the possible cocaine poisoning through the liberal use of t

Some Therapeutic Applications of Nerve blocks

Dr G C STEEL reviewed the now indications for nerve blocks, and mentioned the venous injection of procaine He described one in which such an injection of 5% procaine about the dramatic recovery of an apparently patient who had received 12 ml of 1 in 1000 adrenalin He also recorded a case of anuria after a mismatched blood transfusion, a 'Nylon' catheter was passed intrathecally, and a continuous 'Nupercaine' block maintained for twenty four hours The patient improved but died sixteen days later Dr J B HARGREAVES mentioned the risk of pulmonary embolus, and Dr MUSHIN stressed the value of nerve blocks in relieving the pain due to inoperable carcinoma

Analgesics in Anæsthesia

Dr LESLIE RENDELL BAKER said that if nitrous oxide was to be used with adequate oxygen some supplement was necessary The latest one to be used for this was pethidine, being an analgesic it was more appropriate than a barbiturate like thiopentone, which primarily a hypnotic If relaxation was required, added 'Flaxedil', and the longer the operation the more striking seemed the benefits of the technique Respiration was easily controlled in thoracic cases cardiac or bronchial reflexes were absent, the patient awoke rapidly, and postoperative shock and sickness were notably absent Nor was there any explosive hazard During the anæsthesia he injected pethidine small repeated doses together with flaxedil whenever required No dose of pethidine exceeded 25-50 mg Some degree of analgesia persisted for several hours after the operation

Dr WINTERBOTTOM agreed with the choice of pethidine He knew of three patients anæsthetised with nitrous oxide and thiopentone who had awakened and felt pain during the operation, they had been curarised therefore could not react Dr JOHN BULLOCH Dr G R HOPPER used trichlorethylene as a supplement to nitrous oxide

Sudden Death during Operation due to Undetected Ganglioma

Dr S B DARBISHIRE reported the case of a woman of 35, who was to have a thoracoplasty for a chronic apical cavity Induction was with thiopentone and tubocurarine, but no tracheal tube was used as the 4th and 3rd ribs were being removed she cyanosed, and this persisted in spite of adequate ventilation with oxygen Her heart was beating forcibly and fibrillating, 10 ml of 1% procaine was injected intravenously She was intubated but died in spite of c At necropsy a small tumour about 1½ in was found at the bifurcation of the aorta Section showed it to consist of adrenal medullary tissue

n a few days, or into the lumen of the gut, n due course it would be passed per vias naturales patient insists on a bit of surgery, when he overed from the perforation, I should be only ased to oblige him with a gastroenterostomy gastrectomy, or anything else he fancies between rs of 9 A.M. and 5 P.M. on Mondays to Fridays e.

* * *

s of professional ethics and etiquette such as M.A. recently circulated are all very well for the it among us who might be tempted to sign articles lay press or appear undisguised in Television hat a humble Peripatetic needs is practical advice little problems arising from his non professional ts with the public What, for instance should done when I was travelling on a Green Line coach d a stout lady with a small boy whose persistent vsmal cough even a psychiatrist could diagnose tussis? The stout lady was already cross, shaking on roughly after each paroxysm, and exhorting o "Give over, 'erbert!", and I was still weighing uty to the community against her wrath if I told hen the coach stopped and they got off ave once or twice intervened when I saw mothers ling their infants along in a pram with the sun ng straight into their eyes but in such cases it is to lead up to one's advice with a few remarks of the hat-a-beautiful baby" type. Usually I don't inter- being mindful of the story of the clergyman who t across a third-class railway compartment and to a burly navvy, "Don t you know, my man, that t of cancers of the tongue are caused by smoking ay pipe like yours?" to which the navvy retorted, on't you know that a lot of thick ears and bloody es are caused by people not minding their own — business?"

* * *

The painter s lot is not a happy one In the kitchen ave spent four days studying the changing fashions wallpaper since 1892 when this house went up Inch painful inch I removed four layers of revolting varnish per, and under it all I found, pencilled on the bare ster, rude messages and queer little sums of arithmetic some long-dead predecessor in my trade The unkind tes from the past did not delay me, but I lost quite ittle time in checking and correcting the sums Yester- y I dabbed on some bright ocean-green paint Only er did I realise that it looked like a yellow that had ded green or vice versa, so today I must cover the me territory in brighter vein. To crown all, I now see at the plaster, tired with age, needs the support of per to stop it crumbling to nothing, but I haven t the ength

* * *

With a common purpose we stood side by side He is above average stature and wore a top hat of ancient ntage, a long white beard, a cravat, a long close fitting ack overcoat, and leggings—altogether he looked like coachman strayed from the Victorian era Scarcely d I noted these details than he addressed himself to "Troublesome little things, aren't they? But shouldn't like to be without them, should we?" agreed, to the latter question at least, and he con- ued, as though to justify the former "My father d to draw off his water with a tube for the last eleven ars of his life" I expressed wonder which deepened he went on "Amazing how he did it, seeing as he d only one arm" Then, our several tasks completed, parted, he still wearing the topper in which may once who knows?—have been coiled the tube

* * *

This firm was quite cheered by its careful study of the llings Report "At any rate,' we said to each other we put it down "there are worse doctors in the country an we are. Remembering that we had two examina- n couches and a number of instruments which we ed quite often, we felt almost smug Unwisely we then rned to the Cohen Report which has plunged us into e depths of gloom It seems a long step from what are to what we might be and an even longer step to hat we ought to be—i e, to what, according to Charles nger, Hippocrates was. We are now turning again to llings he makes better holiday reading

Letters to the Editor

SIGNIFICANCE OF THE DISCOVERY OF THE EFFECTS OF CORTISONE

SIR,—Professor Pickering, in his lecture on the general adaptation syndrome, did a public service by his strictures on the psychosomatic theory of disease Theoretically speaking, the possible existence of psychosomatic diseases cannot be excluded but among the large variety of morbid conditions met with in general practice, one is impelled to ask oneself "where are these diseases?"

Diseases displaying psychological symptoms may be classified as follows

1 Psychological disease unaccompanied by physical disease
2 Psychological disease accompanied by physical disease
   (a) Accidental association of physical and psycho logical disease
   (b) Primary psychological disease causing bodily illness
   (c) Bodily illness causing psychological symptoms

Most of the psychological symptoms one meets in one's everyday work appear to belong to this last group, in that in these cases the brain is behaving merely as one of the organs of the body and is functioning abnormally as the result of a bodily disease Every day, for example one meets children suffering from upper respiratory disease Their tonsils are enlarged They breathe through the mouth They may have otitis, bronchitis muscular twitchings, or rheumatic symptoms, and at the same time they have psychological symptoms They may be grizzling and complaining and suffering from loss of appetite They are often mentally overactive and may suffer from nocturnal delirium and nightmares Treatment of the upper respiratory disease—often by removal of tonsils and adenoids—leads not only, in the usual case, to recovery from the physical symptoms, but also to recovery from the psychological symptoms A similar picture is repeated with other diseases, including the many neglected and undescribed illnesses and syn dromes which occur in general practice and which do not often penetrate to the specialist level.

The confusion caused by the psychosomatic theory of disease leads to the common use of phrases such as "There is a strong psychological element in this case" or "The disease is probably functional in origin"—phrases which are not diagnoses but placebos, which can be read to mean whatever one wishes them to mean From the practical point of view the psychosomatic theory of disease has (whatever its merits) led to the tendency to ignore proper history-taking and careful study and analysis of actual symptoms and physical signs, in favour of the glib diagnosis and the rapid prescription of a cerebral stimulant or depressant

Not infrequently the diagnosis of psychogenic disease is based on an insufficient distrust of negative laboratory findings The 'X ray is negative", therefore there is no osseous or articular disease! The urine is sterile therefore there is no infection of the renal or vesical tissue! The throat swab is negative therefore there is no tonsillar infection! (cf Rantz,[1] who showed in a series of cases that hæmolytic streptococci were found in 16 4% of pre tonsillectomy throat swabs, against 32 7% positive when the tonsillar tissue was cultured.)

The fault may, of course, lie in the very different incidence of diseases at the general practitioner and specialist levels, because of the highly selected type of case which the specialist studies The rara avis of the one may be the commonplace of the other

Oulton Broad, Suffolk. N B EASTWOOD

1. Rantz L A. *J Infect Dis* 1941 69 248

and his family who work the land on which the patient was employed before his illness have all been tested serologically with negative results The patient's wife gave a titre of 1/16 on two occasions, but this is of doubtful importance since she had had no illness of any kind in the previous year She and her husband live in a semi urban area with a pasteurised milk-supply, where the opportunities for acquiring Q fever seem small It seems more probable that the patient got his infection during his work on the farm, where he would be to some extent in contact with livestock Investigations are still proceeding, with the help of Dr J T Quinlan, pathologist to the Wrexham Hospitals, and Dr A J Kingsley Smith of the Public Health Laboratory, Conway

The serological tests were done at the Virus Reference Laboratory, Colindale, and I am indebted to Dr F O MacCallum and Dr B P Marmion of that laboratory for their interest and helpful suggestions in trying to trace the source of the disease

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Poliomyelitis

Notifications in the week ended July 29 were paralytic 197 (190), non-paralytic 108 (71), total 305 (261) (Previous week in parentheses)

The village of Digby, Lincs, with a population of 400, has had 15 definite and 4 suspected cases since July 10 The 130 inhabitants of a new housing estate have had 11 of the confirmed cases, with 2 deaths, but since Aug 5 there have been no new cases on the estate, though there have been 2 or 3 suspected cases elsewhere in the Digby area The finding of a small defect in the drainage system suggested that the estate's water-supply might be contaminated, but further investigations seem to have eliminated this possibility, and the evidence now points to the disease having spread by ordinary contact infection from the first case

Infectious Diseases in England and Wales

Disease	Week ended July				
	1	8	15	22	29
Continued fever (London only)	1	—	—	—	—
Diphtheria	46	63	50	46	42
Dysentery	262	278	222	166	166
Encephalitis					
Infective	3	5	8	11	6
Postinfectious	2	1	—	3	—
Food poisoning	316	188	397	228	203
Measles excluding rubella	8920	8990	9314	8760	8291
Meningococcal infection	30	34	33	38	28
Ophthalmia neonatorum	29	45	29	37	24
Paratyphoid fever	17	15	9	5	7
Pneumonia primary or influenzal	335	285	316	293	277
Poliomyelitis					
Paralytic	124	139	152	190	197
Non paralytic	36	73	60	71	108
Puerperal pyrexia and fever	70	74	67	94	87
Scarlet fever	1085	1040	1176	1154	1012
Smallpox	—	—	—	—	—
Typhoid fever	7	2	3	6	10
Typhus fever	—	—	—	—	—
Whooping-cough	3921	3943	4117	3881	3714

In England Now

A Running Commentary by Peripatetic Com

Confound your geriatrics If we live longer
More work must we do,
To pay for our upkeep and deem it a privilege
If all this much vaunted longevity
Means we can never retire,
Can't loaf with a book for the last bit,
Or snooze by the fire,
Then keep your geriatrics, brother I'm opting
for brevity

* * *

I did a couple of appendices and a strangulated between dinner and midnight I was lying in bed my final cigarette when the porter came and told there was a "perf" in admissions I was just d off to sleep about two hours later when he came me of the second one He announced the third I was consuming tea and toast with night-sister that it was not worth trying to sleep, so I borr some cigarettes and lay down on my bed trying console myself with the thought that I should be late for breakfast I also pondered about "perfs."

Here, I pondered, is a bloke leading a fairly no life when suddenly his peritoneum is flooded with suspension of inadequately masticated fish and chips beer, diluted with a little gastric juice and a scoop of mucus He feels the most ghastly pain and sick more than somewhat from shock Sooner or later two ham-handed louts come and throw him into a spring ambulance which proceeds directly across country deposits him in admissions Though he is now hospital his tribulations are by no means over a nurse starts asking him if he is married, what religion is, whether he is on the telephone, and other silly questions Then doctors come in and him with a lot more nonsense, mess him about, finally give him what he has been wanting all along —a shot of something to dull the pain. In the end, devious routes and with many delays, he gets what came to the hospital for—the operation

This, no doubt, is how it all looks from the patient point of view But what I kept asking myself as dozed on my bed was Is the operation really necessary This chap has an irritant fluid in his peritoneal cav which is being diluted rapidly by exudate and all of other things that the pathologists talk about Th just on the off-chance that the perforation has sealed itself off, this wretched fellow, shocked almost death, is laid on the table, and, while a sleepy house disguised as an anæsthetist pours poison in at his end, I hack a hole through his abdominal wall O inside, not content with disturbing the barriers have been built up to contain the spreading fluid sprinkling talcum around, I must tear the omentum away from the hole it was in the process of block put a couple of insecure sutures through the œdema tissue, and, to add insult to injury, clap the omentum back where I found it Finally I patch up his abdomin wall after a fashion and leave him in bed to on shock, ileus, and an early bronchopneumonia as he may

It's all wrong When the houseman has diagn a "perf" he should not send for me at all He should get the resident radiologist out of bed Having given the patient morphine and emptied his stomach with Ryle's tube, the X-ray man should inject a little barium down the tube and screen the patient to the leak This, having been found, the patient then be given a gelatin capsule to swallow in which the pharmacists have cunningly concealed a tiny gadget resembling a bath-plug, but with the plug more like a cork When the gelatin has dissolved radiologist, with a few deft strokes, guides the into the hole and thus stops most of the leak chain of the bath plug would be so contrived that would slough off in 5–10 minutes, leaving the plug in In an hour or two the omentum would have occ the perforation completely and then the plug be at liberty to slip either into the peritoneal where its nature would cause it to disintegrate

—	1 Undecylinic acid	2 Controls	3 Calciferol
atients	30	19	19
ly dose	8 g	—	100 000 units
ration of treat	8 weeks	9 weeks	6 weeks
	None	1 (5%)	6 (32%)
mproved	5 (17%)	5 (26%)	4 (21%)
mprovement	3 (10%)	7 (37%)	6 (32%)
cted	19 (63%)	4 (21%)	2 (10 5%)
orated	3 (10%)	2 (10 5%)	1 (5%)

will be seen that in this series there was no evidence y benefit from undecylinic acid, and these findings accord with other published reports [4]

seems that in assessing the response to treatment of itions such as psoriasis, the results obtained in a l uncontrolled group of cases are useless It also s that it would be wiser to publish early reports, that of Perlman, in a journal of investigation and arch than in one with a wide and general circulation

ndon, W 1 STEPHEN GOLD

EOSINOPHIL-COUNTS

IR,—In your leading article of June 3, you drew ntion to the possible errors in estimating adreno ical function by means of eosinophil counts, and underlined the importance of a reliable counting hnique

his seems an appropriate moment to recall a ret" technique described by me some years ago [5] e method is based on a dibasichrome, using two vital- aining basic dyes—an oxazine and an azine aniline dye obtained from Messrs Bayer, Hoechst Frankfurt The ution fluid is

New blue R	0 1 g
Rhodulinc violet*	0 05 g
Aqua dest ad	100 ml

* A safranine derivative

e technique is the same as for an ordinary leucocyte- unt, the only difference being that this solution is used dilution of the blood The eosinophil granules are ined dark bluish black and cannot easily be over ked, the cell nuclei are stained light violet mphocytes, monocytes, and neutrophil and basophil nulocytes can be differentiated The method can o be used for Arneth counts

London N W 11 M G GOOD

NURESIS IN ADULTS AND ABNORMALITY OF SLEEP

SIR,—I can support much of what Dr Strom Olsen rs, in his article of July 22, about the association of turnal enuresis with hypersomnia

have 28 enuretics at the Portman Clinic being treated h 'Dexedrine' These cases, of which 26 are children ween the ages of six and sixteen, are or have been ending the clinic for behaviour disorders or delin ncies, the enuresis being a secondary symptom, indeed often one of many symptoms of a psycho ic order In this latter respect they do not conform h the description of a non neurotic type given by Ström Olsen

n my series dexedrine in doses of 5–15 mg has been rely effective in stopping bed wetting in 19 cases, very helpful in another 4 In 6 cases an inert let was given as a control, with very temporary provement or no good effect at all In 2 cases where the patients were disturbed by sleeplessness the treatment was terminated

My impression is that the dexedrine effect is likely to be accounted for by postulating both a central influence on the hypothalamic centres associated with sleep and micturition, and also a cerebral effect in its well-recognised ability to produce a sense of well being security, and confidence so much lacking in these children

London W 1 CHARLES LEWSEN

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INOCULATION CERTIFICATES REQUIRED ABROAD

SIR,—From a considerable experience of travelling to countries round the Middle East during the last five years, I can strongly support Sir Philip Manson Bahr's plea for a system by which authoritative information can be obtained as to the requirements of various governments regarding certificates of vaccination and inoculation Regulations are frequently changed owing to epidemics arising in various countries

The confusion is exemplified by a statement in Sir Philip's letter He emphasises the necessity for possessing certificates of smallpox and yellow fever inoculation by *all* travellers to Egypt, whether visitors or passengers in transit While this is correct for those who approach Egypt from the south or east, it does not apply to travellers from England But a traveller who reaches Egypt without a yellow fever certificate and subsequently wishes to go further south will find that no air line will allow him on a plane

It is not safe to rely solely on the advice of officials of the air line concerned I have on several occasions received inaccurate information confidently given in the best faith A safer plan is to consult the consul or a recent traveller, but the only safe method for those who are intending to visit several countries is to keep inoculations up to date with the certificates properly authenticated Even then it is by no means easy to discover what certificates will be accepted as being properly authenticated and up to date

London W 1 HENRY TIDY

THE PSYCHIATRIC SOCIAL WORKER

SIR,—The following advertisement has appeared in the public press

NOTTINGHAMSHIRE COUNTY COUNCIL PUBLIC HEALTH DEPT

Appointment of three Female Mental Health Workers

Applications are invited from suitably experienced Women for the above appointments to undertake various duties under the Mental Deficiency, Lunacy and Mental Treatment Acts Preference will be given to duly qualified Psychiatric Social Workers or Candidates with a Diploma or Certificate in Social Science, and if so qualified the salary will be £370 + £20 p a –£530 p.a, commencing according to experience *For unqualified persons the salary would be* £480 + £15 p a –£525 p a A motor travelling allowance and subsistence are also payable

Application forms and further particulars are obtainable from the County Medical Officer County Hall, Trent Bridge, Nottingham, to whom completed applications must be returned by July 24th, 1950

K. TWEEDALE MEABY
Clerk to the County Council

The italics are mine

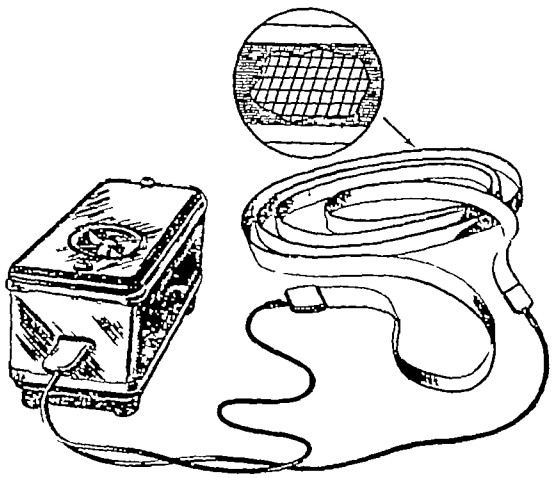
It would, I think, be difficult to imagine anything better calculated to deter prospective entrants into this professional group or to disgust and alienate those present members who—against odds—have devotedly striven to maintain the present standard of professional integrity which we—their colleagues—have come to expect I feel sure that this denigration of the professional standards of a small group within our greater professional body will cause not only you, Sir, but all liberal minded members of the medical profession to request an immediate review of the status of the

ELECTRIC HEATING ELEMENT FOR THE LIMBS

SIR,—Last year I reported briefly that in rheumatoid arthritis the prolonged application to the lower half of the body of a large electric blanket at a temperature of 115°F, had a beneficial effect[1] I pointed out that an electric blanket was a clumsy device for applying continuous heat, because it severely restricts leg movements I also mentioned that an appliance used for this purpose should be shock proof and safeguarded against short circuiting and burning, and should have a temperature regulating mechanism

For the last four months I have been using an appliance which appears to satisfy these conditions

This appliance, depicted in the accompanying illustration, consists of a 20 ft ribbon containing a heating element of wire gauze mesh of stainless steel, $1^1/_2$ in wide, which is embedded in insulating chemical resisting, plastic material Flex leads connect the two element plugs to a 24 volt safety



transformer The use of the low voltage removes any danger of electric shock Two of these elements, one for each limb, can be applied at the same time, and both arms or legs can be treated The skin is protected by a long woollen bedsock or crêpe bandage, and the element is wound round the limb from foot to mid thigh, or from wrist to shoulder An insulating rectangular sheet of kapok of the correct length is then tied round the limb The temperature of the element can be varied by switching the transformer from "high" through "medium" to "low," and also by making the coils wound round the limb overlap Two layers of element will raise the temperature to 125°F when the transformer is on "high," whereas one layer will give a constant heat of 115°F of an equable distribution

Four cases of rheumatoid arthritis have been treated with these elements continuously for 2–3 weeks, and the results agree with those achieved by the electric blanket method One of these patients also had chronic severe psoriasis on the extensor surfaces of the limbs, and it was noted that the skin lesions improved considerably during the heat treatment I therefore thought of trying the application of these elements to limbs affected by psoriasis, and I have now treated six patients suffering from chronic psoriasis who have failed to respond to other therapy

In 3–4 days thick yellow scales, which peel off easily form on the raised discs New scales form until, after 7–14 days of treatment, no new scales develop and the skin of the affected area is no longer raised It still looks red, but the covering layer is soft and smooth The redness gradually fades from the centre to the periphery of the lesion, until the skin looks normal again In three patients the psoriasis gradually reappeared, though in a less severe form One patient with very large chronic lesions responded very well, but one month after he left hospital fresh lesions of the small, papular type developed, though the chronic psoriasis on his limbs had cleared up Two patients had the elements applied to the arms One young woman, with large chronic discs on abdomen, chest, and back, and additional lesions on vulva which caused severe pruritus, was left wrapped in an electric blanket at a temperature of 115°F for two with a typical response and well marked improvement in skin condition and the pruritus It would be to try these elements in conjunction with various applications of proved value in psoriasis and also with administration of calciferol by mouth

Finally, two patients with chronic varicose which had resisted prolonged bed rest and various treatments, showed rapid healing of the ulcers when elements were applied to the legs for two weeks

I wish to thank Mr A Dudley, of Windak Ltd., W Poynton, Cheshire, for supplying me with the equipment in this work

ERIC FRANKEL
Physician

Wanstead Hospital London, E 11

1 Frankel E *Lancet*, 1949 II 1084

HOSPITAL ACCOUNTS

SIR,—You do well to welcome (July 29) the improved system of subjective accounting which has been ordered but beware of the danger

We are managed by laymen and by finance departments who do not understand patients' needs. They tend to be pleased when "So and So shows a low figure." They are not so concerned to make sure that he gave the same amount or quality, and that the patient was made as happy or got well as quickly

Comparative accounting is good when it avoids extravagance, it is dangerous when relied on without discrimination, for it may then encourage parsimony and depress treatment Your editorial help will be needed to protect patients from the latter

NOEL H M BURN

UNDECYLINIC ACID IN *PSORIASIS*

SIR,—In an annotation[1] last year you drew attention to a report by Perlman[2] on the beneficial effect of psoriasis of undecylinic acid given by mouth. Seventeen patients had received this medication and he noted the disappearance of itching, improvement in affected nails, resolution of subacute cases, and great benefit to chronic sufferers Later he and Milberg[3] reported a larger series of cases in whom the effects were not so encouraging. Unfortunately, psoriasis is a common complaint and sufferers are ever ready to seize on new forms of treatment As was to be expected, these American reports were widely publicised by the lay press, and St John's Hospital for Diseases of the Skin received constant inquiries about "the new American treatment", so we decided to undertake comprehensive trials with this drug

These trials were started in May, 1949, and continued over a twelve month period At the outset some cases were treated as inpatients at the Middlesex Hospital under Dr Ray Bettley, while the remainder were seen at a special outpatient clinic at St John's The dosage schedules varied from case to case but were on the lines advocated by Perlman The patients were divided into three groups

1 Receiving undecylinic acid capsules
2 Receiving capsules containing an inert oil which was identical in appearance with the "active" capsules and were given in similar amounts
3 Receiving calciferol by mouth

As regards local applications, all the patients were treated in the same manner—i e, those who had already been receiving local treatment when they were referred to the special clinic continued with the same routine whereas those who had not started on any topical applications received the oral medication only The following table summarises the results obtained

1 *Lancet* 1949 I 575
2 Perlman H H *J Amer med Ass* 1949 139 411
3 Perlman H H Milberg I L *Ibid* 1949 140 85

Notes and News

LLING EXPENSES OF HOSPITAL PATIENTS

ason for paying travelling expenses to and from is to prevent hardship where patients have to go long or for long periods to get treatment Hitherto, nt s claim for his fare has depended solely on the frequency of his journey Experience has shown that some patients have claimed and been paid their n they could themselves have met the cost without

Sept 1 there will therefore be a change in the e From that date the hospital will no longer be ole for deciding whether it would cause a patient to pay his own fares and this assessment will be y the National Assistance Board A standard form cation will be supplied to hospitals which should be by the patient and sent to his local office of the board in an emergency it will usually take not less than 7 the board to complete the assessment Except where ent is already receiving assistance it will be usual for r of the board to visit his home The assessment of d will be based on the cost of travelling by the cheapest public transport The board will not allow for taxis, ients whose condition makes it impossible for them to blic transport will be able as before, to be carried free rge by ambulance or sitting case car when this is sed by a doctor or other appropriate person Hospitals ed to satisfy themselves that the patient really cannot alone, before authorising an escort for in the past the y of Health thinks this concession has been much

scope of the new arrangements will not be so wide as l, but no patient really needing help to pay his fares prevented from getting hospital treatment

THE NAPKINLESS AGE AGAIN

ETHER it comes of letting the male get into the kitchen, ether it has been revealed to women in one blinding re flash humanity has at last realised that washing napkins is a mug's game Hence in recent years various ls have been devised for fitting babies with destructible made of cellulose

xample recently put on the market is 'Babichou,'[1] a container which ties round the waist, when it fits like of neat bathing-drawers It is lined with cambric, and pocket at either end to hold in place a strip of cellulose lastic material is made from polyvinyl chloride, and is be non toxic and non irritant, as well as washable and le When the tapes at the waist are untied, the garment out flat and the soiled cellulose can thus be removed and d or—since it is soluble—flushed down the water-closet strip of cellulose can be fitted without taking the nt right off Babichou is made in various sizes, and is xpensive—any size costs 4s 11d The cellulose is a more serious item costing 1s 11d for a roll capable of g 18 refills, or 2s 11d for a packet of 18 refills ready cut 8 refills will not go far with a normal baby, and an of 6–7s a week is too much for the poorer mother—who lly needs help with the napkin problem

chou is very similar to a garment described last year columns by Dr Quintin Maclaine[2] Another variation theme also described last year by Dr C F McKhann Mr George Bremont[3] of Ohio, has a boat-shaped ner which allows the excreta and urine to drop away he baby s skin, and so preserves him they claim, from ngo, sore buttocks, eczema, ulceration, cystitis, and s—and even gastro-enteritis caught from the hands of urse who has changed another baby Moreover the r can empty the container without touching the se, so preserving herself from contamination.

se thoughtful advances in infant hygiene are all very ne but what we want now is something really cheap way of an absorbent

[1] by T D & Bee Ltd 14 St Petersburgh Houses, St tersburgh Place London W 2

[2] 1949 i 1024 The napkin holder described will be nufactured under the name Paddi and the disposable kin under the name Paddi pad by Messrs Robinson & s Ltd Wheat Bridge Mills Chesterfield.

[3] 1949 34 131 see *Lancet* 1949 i 805

University of London

At recent examinations the following were successful

M.D (branch I medicine)—Daphne S A. Anderson, P G Arblaster Geoffrey Beven, E P Bharucha D P Bowler P D Bryant, G B Carruthers Betty L Coles J B Cook, J N C Cooke Rosemary Davies D M Douglas H J B Galbraith R F Griffith Evans A G S Grimble D B Gunasekara H C Hamilton E P W Helps H D G Hetherington F C N Holden Mary C Holt O A N Husain S L O Jackson J W M. K. W S Jayewardene I D MacDonald William Mackenzie J G Millichap J C Mitchell Madeleine B Morris *William O Brien, Ethel A Perrott *F I Rackow G S Ratnayale R B Sloane Margaret H Stanfield Kathleen Staynes *†J S Stead B E R Symonds G I Tewfik J L G Thomson D Q Trounce R B N Wilsdon B B Zeitlyn.

M D (branch II pathology)—J D Abbott, D N Baron A R Blowers B S Cardell M. C H Dodgson R J Evans H P Ferreira A K Mant A F Mohun, D S Ridley, Harold Sterndale Fitzabeth Topley

M D (branch III psychological medicine)—J P Crawford, Max Hamilton

M D (branch IV midwifery and diseases of women)—H D Freeth Freny Kohiyar F C R Picton G J Sophian

M D (branch V hygiene)—L R L Edwards H T Phillips Alison D McDonald G H Stuart W C Turner

M.D (branch VI tropical medicine)—Simeon Fernando

* Distinction † University medal.

The following have been recognised as teachers of the university in the faculty of medicine

A C Thackray pathology F C Golding radiology Rainsford Mowlem surgery T Holmes Sellors surgery all at Middlesex I W Magill anæsthetics G S W Organe anæsthetics J G Humble, bacteriology Brian Lacey bacteriology, I McA Anderson children's diseases G D Lumb pathology A D Morgan pathology all at Westminster Nuala F T Crowley bacteriology Royal Free J P Quilliam pharmacology King s College Kenneth Cameron mental diseases Institute of Psychiatry V B Green Armytage, obstetrics and gynæcology at the Institute of Obstetrics and Gynæcology R O Holland, dental surgery Guy s Hospital J F Ryan anæsthetics St Thomas s

University of Bristol

The dissertation of G F M Hall has been approved for the degree of M D

Royal College of Surgeons of England

At meetings of the council held on July 13 and Aug 3 with Sir Cecil Wakeley, the president, in the chair the honorary medal of the college was awarded to Lord Webb-Johnson in recognition of his many generous acts and continued labours in the interest of the college throughout the eight years of his presidency The Gilbert Blane medal was presented to Surgeon Commander E B Martin, R.N, for his research on naval aviation medicine

Mr A Hedley Whyte, Mr E W Riches, Sir Arthur Porritt, and Prof A M Clave were admitted as members of the council Prof C A Wells and Mr McKie Reid were elected members of the court of examiners, and the following were re elected Mr V E Negus Sir Stewart Duke Elder, Prof F C Ormerod, Mr F W Law, Mr M L Formby, Dr David Slome, professor of applied physiology was also appointed as Bernhard Baron research professor

The Mackenzie Mackinnon fellowship was awarded to Mr P S Murley The Hallett prize was awarded jointly to Tara Chandra (Lucknow University) and Malik Shaukat Hasan (Punjab University) The Macloghlin scholarship for 1950 was awarded to J J Fryatt (Lewes County School)

Hunterian professors Mr A W Allen, colonic surgery Mr R T Johnson carotid ligation for intracranial aneurysms, Prof Milroy Paul blood and lymph pathways in the spermatic cord Mr A Wilfrid Adams transurethral surgery Mr Denis Browne, congenital deformities of mechanical origin Mr Harvey Jackson tumours of the orbit Mr F G Hollands malignant disease of the urinary bladder, Mr P G L Essex Lopresti fractures of the os calcis Mr J C Golligher functional results following sphincter saving excisions of the rectum Mr C A R Schulenburg adamantinoma Mr B N Brooke, surgery of ulcerative colitis, Mr Arthur Naylor brachial neuritis Mr R P Jepson clinical and physiological study of 200 cases of severe Raynaud s phenomenon Prof B W Windeyer, radiotherapy in the treatment of malignant disease *Arris and Gale lecturers* Prof J M. Yoffey, film of the lymphatic system, Mr J B Kinmonth surgical physiology of large arteries Mr W J Dempster homotransplantation of tissues *Erasmus Wilson demonstrators* Mr O E Shattock Mr P H Mitchiner and Dr L W Proger *Arnott demonstrators* Mr R. J Last, Dr F S Gorrill Dr H D Ross *Frederick Hewitt lecturer* Dr George Edward.

The following were elected fellows of the faculty of anæsthetists J C Nicholson D Blatchley, A G Shields, H R Sheppard

Diplomas of fellowship were granted to the following

W E Wimberger, N T Holden J B David, S H Janikoun R P Crick J D Randall G H D Channing J G Craddock William Sewell R O Wheeler R S Henderson J G Stubbs A J Evans L R McLaren D T R Evans Prithvi Raj Sondhi

psychiatric social worker and the prompt disinterment of the Mackintosh Committee's report I have already drawn your readers' attention to the difficulties under which this important branch of the psychiatric service has been labouring [1] and the alleviation of these difficulties is now urgent

R SESSIONS HODGE
Psychiatrist in Charge
Neuropsychiatric and
E E G Dept

Musgrove Park Hospital,
Taunton

BROADCAST POSTGRADUATE LECTURES

SIR,—I read with interest your report last week (p 239) on the postgraduate medical lecture given by Prof Richard H Freyberg from a New York wireless station on July 27 These lectures are an excellent innovation and one which would surely appeal to a great many doctors in this country A series of specially selected lectures or discussions could be arranged either by the British Medical Association or the Royal Society of Medicine, and would be of very great help especially to medical men in the provinces who are unable to avail themselves readily of attendance at R S M meetings, and so on These lectures would bring to the microphone the voices of many we would like to hear, and many an excellent lecture which goes unread in *The Lancet* and *British Medical Journal* or other journals would be listened to with interest and profit

I would suggest that these lectures should be given in the Third Programme at a convenient time for listening, for example 9 15 P M –10 P M , and they could also be published in *The Lancet* or *B M J* for future reference

Swansea IVOR J THOMAS

Obituary

ERNEST CRANMER HUGHES

M CHIR CAMB , F R C S

Mr E C Hughes, whose death on July 28 we announced last week, was perhaps the most loved teacher Guy's has known in the last fifty years

Born at Plymouth in 1878, he was educated at Marlborough and Clare College, Cambridge, where he obtained a first-class in the natural sciences tripos In 1901 he entered the medical school at Guy's where he qualified three years later After holding house-appointments he took his F R C S in 1906 and his M CHIR. a year later In 1911 he was elected to the staff of Guy's as assistant surgeon During the 1914–18 war he served in the R A M C , and he was also consultant surgeon to the Queen Alexandra Military Hospital at Millbank In 1932 he was promoted full surgeon at Guy's and in 1938 he nominally retired But the following year he was working rather harder than ever as senior surgeon and teacher at the E M S Pembury Hospital to which Guy's medical school was evacuated He also continued to give a weekly teaching round at Guy's itself He examined for the Universities of Cambridge and Birmingham and from 1930 till last year he was a member of the court of examiners of the Conjoint Board

As a house-surgeon Hughes's chief had been Arbuthnot Lane, and as an assistant surgeon F J Steward Throughout his life he retained the clean gentle technique of the one and the clinical soundness of the other But it is as a teacher that he will be best remembered His ward rounds were crowded occasions, with visitors from other hospitals who had come to hear him teach the bedrock principles which few could handle so well, for with his quick wit and humorous phrases he could deflate the pompous theory or the book-stuffed student and fix the simple truths in the minds of his hearers When he retired W H O wrote of "Joey" Hughes in *Guy's Hospital Gazette* "He is seldom serious, yet withal so obviously earnest that his chaffing questions can never excuse a careless or flippant reply He draws the whole class into the family circle, by appeals to each in turn, by interrogations pushed firmly but kindly to the verge of the third degree, and then suddenly transferred to another whose seems to flag Ridicule is alien to him fo suggests malice The stories related of him able, all illustrating the whimsical side of his his ability to comfort a diffident houseman by th ance of a droll non sequitur, his power to al pain or still the fears of an anxious patient banter"

Mrs Hughes survives him, with their daugh their son, Dr A C Hughes

PETER LEWIS DANIEL

F R C S

Mr Peter Daniel, consulting surgeon to Ch Hospital, died at his home at Checkenden on Ju at the age of 79

He was born and educated at Carmarthen Charing Cross, where he held a Llewellyn he qualified in 1898, and during the rest of his except for a short period of postgraduate study in he was associated with "The Cross" After house appointments there he took the F R C S in and in 1905 he was elected to the honorary staff he was appointed lecturer in surgery at the He was also on the staff of the Metropolitan and G Hospitals, and after he retired from Charing Cross 1931 he continued his work at the Gordon Hospital it was taken over by the National Health Service 1948 During the late war he returned to help Cross by working on the surgical side of the hospital at Ashridge For many years he acted as referee to the Cremation Society

One of the founders of the hospital Masonic lodge Chere Reine, he passed through the chair in its early days, and he also held office as treasurer for over years In the meantime he had attained London grand rank

"Peter Daniel was the last survivor of the surgeons who were on the staff of the Charing Cross Hospital when I became a student there" writes N L "At that time the junior surgeons were also demonstrators in anatomy and it was in this capacity that the first met their future chiefs on the surgical side Th too, was the period before extreme specialisation h become the fashion, and so it is not surprising to find Daniel also held the post of pathologist and of the museum as well as being assistant in the el department of the hospital

"Many old students will recall with gratitude very practical teaching, without any 'high falutin' which they received from Peter His surgery was n ostentatious or showy, but his judgment and opini were sound to the core Indeed, my chief impress of his character is of a man of great honesty of p straightforward, with the courage of his and with an abundance of common sense For reasons he was not only a very trustworthy surgeon also an excellent chairman and committee-man. With late Dr William Hunter he was responsible for direc the attention of the profession to the importance of sepsis, especially in relation to certain forms of —a thesis which he developed in his book *Arthritis Study of Inflammatory Diseases of Joints* The gro to which Daniel belonged produced many fine, con tious surgeons who did magnificent work but abhorred publicity of any sort He was true to type many old Charing Cross students, including must be thankful for their association with so fine likeable a character"

Mr Daniel is survived by his wife and their only Dr P M Daniel

Appointments

BARLOW, K. E M R C S , D M R senior registrar in rad White Lodge Hospital Newmarket.
FRASER J D M.D Glasg D P.M consultant St Andrew's Hospital Thorpe Norwich
MITCHELL HEGGS F S T D M B Lond F R C S., F R C consultant surgeon Bury and Rossendale group of h
POWELL, K J M.B Lond. D A consultant anæsthetist clinical area
SHANNON, T A. M.B Lond appointed factory doctor district Notts

1 *Lancet* 1949 ii 1155

TS OF INTRATHECAL TUBERCULIN STREPTOMYCIN IN TUBERCULOUS MENINGITIS

AN INTERIM REPORT

ONOR V SMITH R L VOLLUM
LD, B Sc Lond M A, D Phil Oxfd

he Departments of Surgery and Bacteriology, Radcliffe Infirmary, Oxford, and Military Hospital (Head Injuries)

WEEN November, 1946, and Jan 1, 1950, 84 s with tuberculous meningitis were treated at the ffe Infirmary, Oxford, and the Military Hospital ad Injuries, Wheatley Of the 42 patients who treatment before October, 1948, 22 died, giving r all mortality rate of 52% While treating these we became rather better able to recognise some signs of latent meningitis and were therefore in a position to know when it was dangerous to stop ient In 1948 we decided to give longer courses tramuscular and, in particular, of intrathecal omycin in those cases in which the meningitis was ipanied by an overt miliary spread or by persistently systemic tuberculosis As a result the mortality ince October, 1948, has been nearer 40% than 50% ince in almost all the fatal cases streptomycin was up to the time of death, and since reports from other es indicate that shortened or intermittent treat is dangerous (Dubois et al 1949, MacCarthy and 1950), it is hard to see how results can be sub tially improved by further modifications in régime

THREE PROBLEMS

ien the experience gained in treating this series is yed three problems stand out

e first is Why has it been possible to cure only 50% of patients ?

e second is the extreme difficulty of making an ate prognosis in the individual case The only rs that we have found to be of prognostic significance he outset of treatment have been the state of ciousness and the presence or absence of focal ological signs, and these only in their crudest terms although most of those patients have recovered were fully conscious and rational when first seen, w have died, while of those who were deeply orous or delirious, a few have lived Nor is the ulty confined to the first few days of treatment asionally a patient may make a dramatic improve t from the outset, but as a rule he remains critically ill iany weeks (Smith, Vollum, and Cairns 1948, Lincoln Kirmse 1949) During this time he is drowsy, hetic, and incontinent, or frankly demented He its frequently, his appetite is poor, and he persistently weight (Cairns and Taylor 1949, case 4) Typically protein in the cerebrospinal fluid (C S F) rises, the ure often falls, and spinal block may threaten ipervene, while new focal neurological signs may ar all evidence that though the infection is sup ed it is not fully controlled Then, in successful a sustained improvement slowly becomes apparent at last it is no longer too rash to say that the patient robably recover In fatal cases the period of dead- may be prolonged for months, but ultimately it hes only too obvious that the patient is losing ld more and more rapidly until finally he dies, with a terminal rise in intracranial pressure

ere is one exception to this difficulty in prognosis s the condition of decerebrate rigidity (Wilson 1920) the patient has not only become comatose, but lso developed tonic extensor rigidity with hyper pronation of the forearms, opisthotonos, tonic spasms, and chewing and sucking movements (fig 1), we have never seen any improvement whatever, and most patients died in a matter of days (usually three to twenty one) We have accordingly found the decere brate state the only absolute indication for stopping treatment

It is easy to say that those patients recover whose treatment is begun early in the illness, while the others die, but it has unfortunately proved impossible as a rule to tell what stage the disease has reached when the patients first come for treatment Apart from the decerebrate state, which is almost a terminal event, there is no finding, either in the clinical picture or in the C S F, which has not been seen in successful as well as unsuccessful cases

The third problem is closely allied to the other two In fatal cases the most constant and characteristic necropsy finding is the thick collar of exudate surround ing the mid brain (Daniel 1949) On microscopy, nests of organisms can be found embedded in this exudate, which protects them from the streptomycin in the blood and C S F, and thus enables them to keep the inflammation smouldering (Cairns 1949) In those cases in which spinal block develops, the spinal sub arachnoid space is found choked with similar exudate Many of the effects of the basal exudate are easily recognisable clinically (Smith and Daniel 1947, Smith, Vollum, and Cairns 1948) and have been frequently seen in successful as well as in fatal cases Moreover it is possible for a patient to have a complete spinal block for months and yet to recover, and for the block to disappear A considerable degree of reso lution of this exudate must therefore be possible What is it then that determines whether the exudate will resolve or whether it will persist and increase to death ?

Fig 1—Complete decerebrate rigidity in tuberculous meningitis unsuccessfully treated with streptomycin

It would seem that there is some important factor other than the "drug-organism relationship" that we have been unable to recognise, far less to assess This unknown factor is presumably related to the host response, and a possible clue to its nature has been given by the behaviour of the cells and protein in the C S F in cases under treatment with streptomycin

C S F CHANGES DURING STREPTOMYCIN TREATMENT

Ever since we first began this study it has been our practice to combine the intramuscular administration of streptomycin with long uninterrupted courses of daily

O M Jonathan, A M B Tompkin R H Maudsley H O Williams, J P Hopewell J D Trethowan R H Sewell R R Burn J E L Price, C G Attenborough Ghim Seng Yeoh D A Bailey J Upsdell C W Graham Stewart L F Cotton K D Roberts, L F Tinckler, N C D Pizey A J Ruzicka E J Newton Kumar Kanti Ghosh Don Francis de Silva Goonawardena, Arnost Hirtenstein, A B May Rajendra Vir Singh M D Gelfand T M Hennebry, K W B Rostron, G S M. Wilson A F Marshall, Eugen Hoffmann, Basaya Mallaya Pujari O H Schneider, Septimus Eholepola Senevirathne Arnold Ashworth J L Bignell, A T S Paul, Mahmoud Abdulla Sadek Prasanta Kumar Chatterjea Abdel Maguid Mohamed Farag Jayantilal Muljibhai Jalundhwala, William Paterson H J Richards Ponniah Sivasubramaniam D S Chapman I A Lester, J F McInerney P W F Moore C A Simmons H F Smith J H Cloke B S Crawford G M Goodson G W H James Pradyumna Narayan Singh Jayaswal T P Leadman N C Mackillop A W Middleton I H Shelswell, I B Taylor, J H Brown M. D Cromin, F G Crombie D P Greaves M H M Harrison S J Hersch I R Heseltine A A Jefferson Percy Jewsbury Aman Ullah Khan Reginald Merryweather A G Quinlan F G Smiddy J W Sutherland W L Thompson R G Turner R M T Walker Brash T J Wilmot K C Wybar, R E Aitken, D M. Bell A R Cockerell L A Eckert Bernard Hurst, C H Kinder W L Utley F R G Webb B N Catchpole W D Corfield D A Gibson John Hankinson I A McDonald, R G C MacLaren D E Savage R H C Robins M S Strong R H Cram O V Jooma

Postgraduate diplomas and diplomas of membership were granted to those named in our issue of Aug 5 (pp 239 and 240) A diploma of membership was also granted to K M Mehadyenn

Epsom College

The 97th annual general meeting of the governors was held on July 7, with Dr Harold Spitta, the chairman of the council, in the chair He reported that the progress of the school continued to be most satisfactory Rises in costs had forced the council to raise the fees from Michaelmas 1950, and to make a charge for stationery and the use of books The council intended to appeal for funds with which to make lasting improvements to the school in commemoration of the centenary of the college and its Royal Medical Foundation

Ophthalmology Congress

The Fourth Pan American Congress on Ophthalmology is to be held in Mexico City from Jan 6 to 12, 1952

The Scientific Basis of Medicine

A course of lectures on this subject is to be given at 5 30 P M on Tuesdays and Thursdays from October to March at the London School of Hygiene, Keppel Street, W C 1 The course has been arranged by the British Postgraduate Medical Federation and admission will be free without ticket Sir Henry Dale, O M, will open the course on Oct 10 with a lecture on Scientific Method in Medical Research

Payment for Board and Lodging in Hospital

At a meeting of the North West Metropolitan Regional Hospital Board on July 10, Prof H W C Vines, said that the Minister of Health s decision to limit expenditure must adversely affect the development of the hospital service After referring to the high cost of provisions, he questioned the statutory authority for providing food without charge to hospital inpatients He thought that a charge should be made and that the money thus saved should be used for developing the service

World Federation for Mental Health

The third annual meeting of the federation will be held in Paris from Aug 30 to Sept 7 About 200 delegates representing 22 countries will be attending The discussions at the meeting have been designed to lead up to the work of the next International Congress on Mental Health in 1951 They are concerned with mental health in education, in industry, and among transplanted and homeless people and with leadership and authority in local communities The government of Mexico has invited the International Congress to hold its meeting there in December 1951

Use of Toxic Chemicals in Agriculture

The Minister of Agriculture has set up a working party "to make recommendations for the promotion of the safety of workers in the agricultural use of substances which are toxic or harmful to human beings, and in particular to advise on the recommendations on this subject made in the report of the Gowers Committee on health, safety, and welfare in non industrial employment" Last year the Gowers Committee recommended that the Minister should be given powers to prescribe by regulations the fertilisers sprays and other chemicals for the use of which the supply and wearing of protective clothing should be made compulsory

Conference on Maternity and Child Welfare

Next year the annual conference on maternity and welfare will be held on June 20, 21, and 22, at Fre Euston Road, London, N W 1

London County Medical Society

The next clinical meeting of this society will at St Stephen's Hospital, Fulham Road, Chelsea on Thursday, Sept 14, at 3 P M Inquiries should Mr J Gabe, F R C S, St Alfege s Hospital, Greenwi

Leverhulme Grant

A Leverhulme research grant has been awarded C W Dixon, lecturer and chief assistant in the of preventive medicine and public health in the U of Leeds, for his work on the epidemiology of smallpox control of variola minor

Plastic Lenses

The Minister of Health has decided to include bi lenticular plastic lenses in the range of glasses cost of which the patient contributes The new be supplied on request when bifocal lenses are pre lenticular lenses are necessary

Royal Institute of Public Health and Hygiene

At 28, Portland Place, London, W 1, on We Sept 20, at 3 P M Dr Nadia du Bouchet, head anæsthetic centre of the Broussais Hospital, Paris, the Bengué lecture on Modern Anæsthesia in Fran its Developments Related to Cardiac Surgery

Aviation Award

The Raymond F Longacre award for 1949 has presented to Sir Charles Symonds by the Aero Med ciation of America This award is given annually association for the most important contribution to psychiatric aspects of aviation medicine, includin development of aptitude tests for flying

American Public Health Association

The 78th annual meeting of the association and meet 32 related public health organisations will be held Louis, Missouri from Oct 30 to Nov 3, under the pre of Dr Lowell J Reed, vice president of the School of H and Public Health, Johns Hopkins University information may be had from Dr Reginald M. At executive secretary of the association, 1790, Broadway York 19, N Y

CORRIGENDUM *Dimercaprol in Acute Lead Poiso* The doses of dimercaprol given by Dr Bastrup- (July 29, p 171) were 0 1 g (not 0 1 mg)

Births, Marriages, and Deaths

BIRTHS

BROWN —On July 30, the wife of Captain J A W Brown, —a daughter

GABE —On July 31, in London the wife of Mr Joel Gabe —a daughter

HARMAN —On July 30 in London the wife of Dr J B. H —a daughter

HOLLINGS —On July 29, at Kingston the wife of Dr Bevan —a daughter

KNOWELDEN —On July 29 at Beckenham the wife of Knowelden—a son

MARTIN —On July 27 at Worthing the wife of Mr Kenneth F R C.S —a daughter

MOON —On July 29 in London the wife of Dr A J daughter

ROWLANDSON —On July 27 at Cambridge, the wife of Mr Rowlandson, F R C.S —a daughter

MARRIAGES

BORN—PLOWDEN WARDLAW —On July 27 in Edinburgh Victor Rudolf Born M B to Wilfrida Ann Plowden W

BOTTOMLEY—ISHERWOOD —On July 29 Frank Bottom to Enid Ruth Isherwood

BOWEN—DAVIS —On July 29 in London David Aubrey Bowen M B to Joan Rosemary Davis

DYER—TAYLOR —On July 29, in London Haydon Dyer to Anne Dorothy Taylor

LAYCOCK—TUBBY —On July 28, at Ruislip John Dixon M B to Irma Tubby

DEATHS

AUDLAND —On July 31 William Edward Audland M.B.E. aged 90

BANKLS —On Aug 1 John Herbert Bankes M R C.S, aged

BRIMS —On July 31 Donald James Brims M R C.S

DANIEL —On July 28 Checkenden Oxon Peter Daniel

HUGHES —On July 28 at Pembury Ernest Cranmer O B E M CHIR Camb F R C S

JENSEN —On July 30 in London Ernest Thomas M B Lond aged 76

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THESIS TESTED

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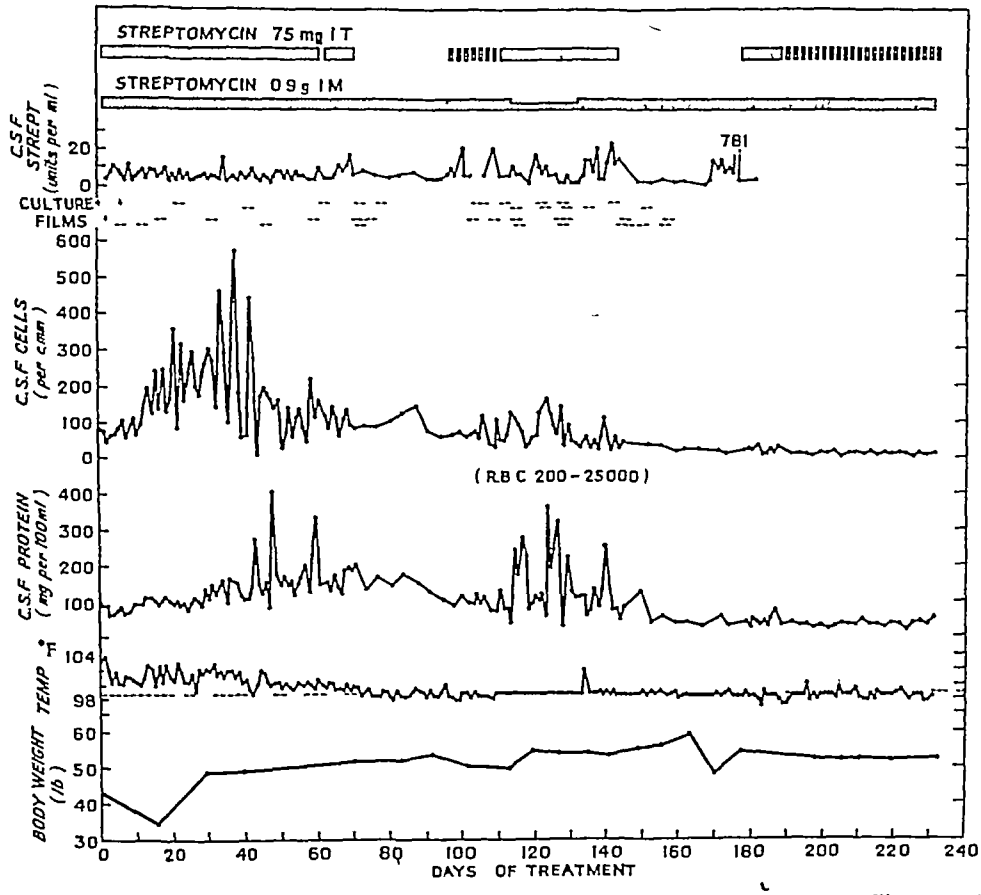


Fig 4—Similar graph in a successful case of tuberculous meningitis complicated by an overt miliary spread Typical spikes in cells and protein are seen during the first course of intrathecal streptomycin but are not reproduced during the subsequent intrathecal courses The irregular disturbances in the protein curve during the second intrathecal course paralleled the number of red blood cells in the C.S.F and resulted from traumatic punctures (Case 67)

n attempt has been made to test this supposition three ways

If it was true, then tuberculin should provoke ise in cells and protein when introduced into the ca of someone sensitised to tuberculoprotein—as wn for example by a positive Mantoux test—but when given intrathecally to someone in whom the atoux test was negative This experiment has now n done many times in subjects in whom the C S F normal in all respects and who were not suffering n tuberculosis.

We have used the purified protein derivative of erculin (P P D)[3] The results are clear-cut Lumbar ctions of 0 75–7 5 μg P P.D have been given to 5 ects in whom the Mantoux test was negative to ml O T 1/100 In no case has there been any cal disturbance, and the cellular and protein response been negligible (fig 6)

y contrast, when given in doses of 0 00375–3 75 μg ubjects in whom the skin gave a moderately brisk onse to 0 1 ml O T 1/100–1/1000, there has always a marked response clinically and in the C S F 7) The clinical response consists in fever and iting The fever usually reaches its maximum ve to twenty four hours after the injection and subsides within two to three days The cell-count rises to 300–3000 cells per c mm and on the first day usually shows 40–80% polymorphonuclears Cultures for pyogenic organisms have invariably been sterile The count then falls for the next three to four days, and then usually rises again After the first two days practically all the cells are lymphocytes The protein also rises to 80–400 mg per 100 ml, and then slowly falls, though it too may rise again slightly with the second, lymphocytic, peak in the cell count From then on the daily cell counts fluctuate, but on the whole the curve falls, though it may be many weeks before the cell-count returns to normal. During the early days of the reaction many of the cell and protein counts are typical of those seen in tuberculous meningitis, and the C S F samples show the classical "cobweb" clot The process is however quite benign The injections have been repeated several times in different subjects and also several times in the same subject, and the clinical and meningeal disturbances can be produced at will (fig 8)

2 The second approach was to collect C S.F from a patient with tuberculous meningitis under treatment with streptomycin at a time when the cell and protein fluctuations were appearing, and, after Seitz filtration, to inject it intradermally into a tuberculin sensitised subject This has been done four times with uniformly negative results However, C S F collected twenty four hours after an intrathecal injection of P P.D, at the time when the clinical disturbance was at its height and the meningeal reaction was beginning, also gave entirely negative results Either the intradermal test is not sensitive enough to detect the minute amounts

ien streptomycin is introduced into the normal theca a ellular reaction is occasionally seen and is accompanied by nausea vertigo and drowsiness More information is needed bout this

P.P D used has been the standard preparation supplied by the Ministry of Agriculture and Fisheries Veterinary Laboratory Weybridge It was used in order to avoid possible non specific effects caused by the glycerin and other impurities present in Old Tuberculin

intrathecal injections At each puncture a sample of C S F is collected, the cell and protein content is estimated, smears are examined for tubercle bacilli, and cultures are set up The results of these daily examinations of the C S F are set out as a graph and in our series a fairly definite pattern can be distinguished (fig 2)

In successful cases the positive films and cultures become less numerous until finally the organisms disappear altogether This usually takes from two to four weeks, but not infrequently tubercle bacilli may reappear in one or two later specimens of fluid

In the great majority of cases the cell counts show remarkable day-to day fluctuations (Cairns and Taylor 1949) At the peaks of these fluctuations the total cell-counts are of the order of 600 to 1600 per c mm — i e, well above the range seen in the untreated disease (Smith and Daniel 1947) Typically these high spikes of cells contain 60–90% of polymorphonuclear leucocytes The fluctuations usually appear between the fourth and fourteenth days of treatment, they may only occur once or twice or they may persist for weeks In successful cases the fluctuations ultimately flatten out and the cell curve begins to fall steadily In those cases however where an isolated positive film or culture is obtained late in treatment, one or two solitary spikes of cells may reappear about the same time as the organisms (fig 12) Occasionally, too, their reappearance coincides with the development of new focal neurological signs

The protein curve also tends to fluctuate from day to day during the first few weeks of intrathecal myein, when the abrupt peaks may be 100-200% previous levels They occur at about the same the high spikes of cells, though often not on the day Apart from day to day fluctuations, the content usually rises for at least six weeks In ful cases the fluctuations ultimately disappear, persistent rise stops and the curve first flatten plateau and finally falls

In unsuccessful cases the organisms either death, or, if films and cultures do become tubercle bacilli can be found post mortem in the Usually the fluctuations in the cells and protein flatten out, but the protein does not fall de in the successful case (fig 3)

The cause of the high and fluctuating cell-counts of the peaks in the protein content is obscure are not due to secondary infection, because pyogenic organisms have always been sterile[1] almost certainly not due to mere irritation by intrathecal streptomycin, because in many cases die down and disappear even though the intrath injections of streptomycin are still being given (fig 2), because it has proved impossible to reproduce

1 Three cases in this series have been complicated by a infection due to *Streptococcus faecalis* *Strep* and *Staphylococcus aureus* respectively Both the clinical and the C.S F findings were profoundly different from the under discussion

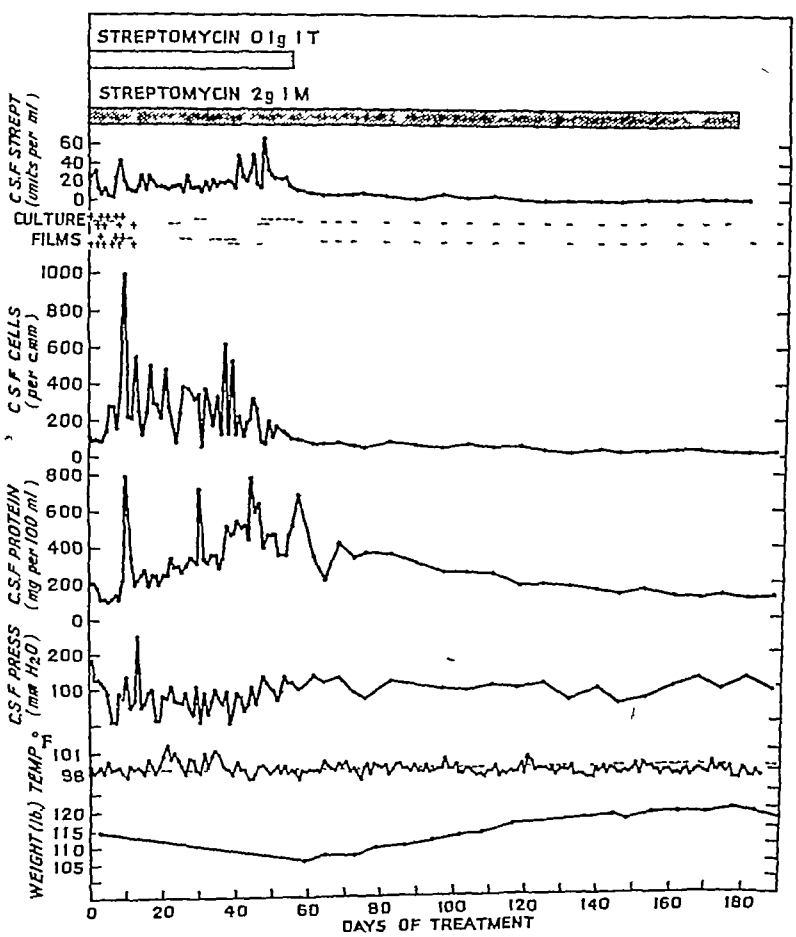


Fig 2—Graph showing C.S F changes temperature weight, and treatment in an uncomplicated case of tuberculous meningitis successfully treated Note the high irregular spikes in the cell and protein curves These spikes begin about the 10th day of treatment when organisms are disappearing from the C.S F In this case they flatten out well before the intrathecal injections are stopped and at about the same time that the temperature settles (Case 48)

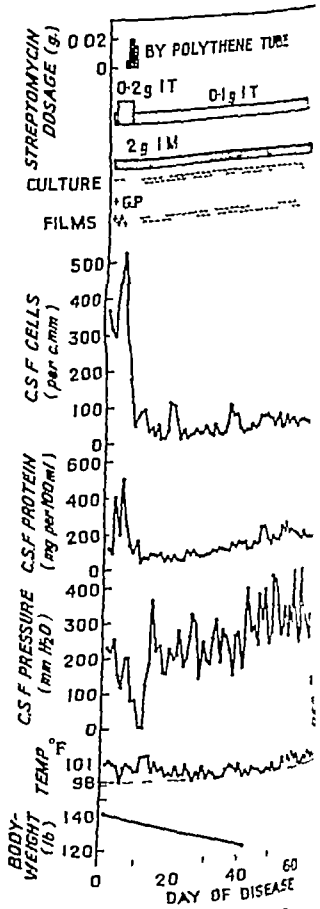
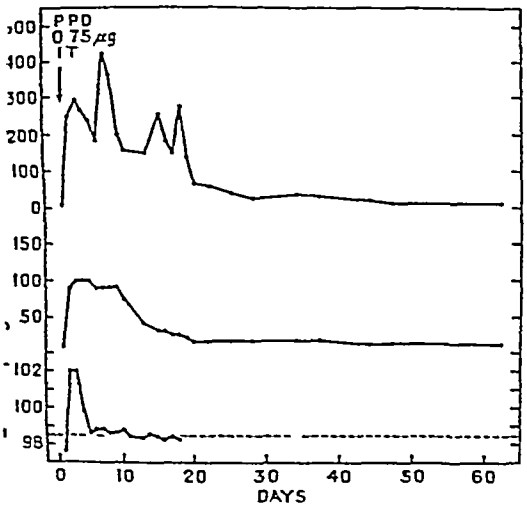


Fig 3—Similar graph to fig 2 in a ful case Note the complete of spikes in the cell and protein organisms have disappeared although the intrathecal injections of tomycin are given daily up to the death Post mortem intense taining clusters of tubercle bacilli occluding the cisterna ambiens (fig 2) (Case 39)



—Similar graph to fig 6 in a patient without meningitis who ived 0 75 μg P P.D by intrathecal injection but in whom the ntoux test was positive to 0 1 ml O T 1/1000 Note sharp rise mperature accompanied by brisk pleocytosis and rise in protein

ed that the lateral ventricles lay within about 2 cm e scalp All four limbs were spastic and paralysed and tightly flexed across his body His pupils were dilated fixed to light and although he would still respond to by a loud bellowing cry, there was no response whatever y visual stimulus

onse to Tuberculin

there was obviously nothing to lose, it was thought fiable to observe the effects of intrathecal injections of At this time an intradermal injection of 0·1 ml 1/1000 gave a flare and weal approximately m. in diameter As no lumbar fluid could be ned, it was decided to make serial observation e cisternal c.s.f According ly two successive les of cisternal fluid were examined (cells 20–22 nl protein 100–82 mg per 100 ml) and then ne 20 7 5 μg P.P.D was injected into the lateral ncle. The same night the temperature rose ptly the tension in the fontanelle increased, and child vomited frequently Still more alarming upper limbs became extended and hyperpronated n the classical decerebrate state The clinical tion, however though severe was short lived, and igh the temperature did not begin to fall for three s there was no immediate anxiety about the child r the first twenty-four hours

he c.s.f response was rather more delayed Nine- hours after the injection the cisternal protein risen from 82 to 240 mg per 100 ml, and 1100 cells per c.mm. had appeared although all recent ctures had apparently been atraumatic The total e-cell count had however not increased signifi dly, though a few polymorphonuclear cells had eared (total 29 per c.mm, 15 polymorphonuclear pposed to 22 per c.mm., 6 polymorphonuclear he time of injection) After another six hours nty five hours after injection) the protein and cells had again risen (282 mg per 100 ml and 00 per c.mm. respectively) while the white-cell it was now 74 per c.mm 46 of which were polv phonuclear The white cells and protein continued se irregularly as shown in fig 9, reaching their mum (150 per c.mm. and 700 mg per 100 ml ectively) ten days after the injection

June 30 and July 1 cisternal injections of an mental preparation of streptokinase were given. same preparation was subsequently tried exhaus y in another case of tuberculous meningitis and out any evidence—clinical, radiological, or at per—of resolution of the exudate The effect of injections was quite different from that produced e P.P.D There was no clinical reaction whatever cells rose within twenty four hours to 660 per . (79% polymorphonuclear) to fall steadily and anently during the next two days There was no significant increase in either the red cells or protein content This response is typical of a mild non specific chemical meningitis

On July 10 the first of several further injections of P.P.D was given, but into the cisterna magna instead of the ventricle As the clinical reaction to the first injection had been so alarming, only one tenth of the original amount was given (0 75 μg) An exactly similar though milder response was seen both clinically and in the c.s.f The dosage was gradually increased and good evidence was obtained of a falling response, as shown in fig 9 There was also evidence that the sensitivity of the patient s skin was decreasing and by the end of September 0 015 mg P.P.D (approximately equivalent to 0 2 ml o T 1/1000) produced a flare only about 2 cm in diameter

Recovery

But to everyone s astonishment as the weeks passed, it became apparent that the child was improving The vomiting stopped except during the twenty four hours immediately following an injection of P.P D, while after each reaction the temperature would fall to a new low level By the end of August 1949, he was gaining weight rapidly, he was much less irritable and was beginning to play with his toys The dusky brown tinge of his skin had nearly gone he was losing the downy hair which had covered his body, and the pressure sores had healed His head was much less retracted and no trace of the extensor posture had been seen since the reaction to the first injection of P.P D Now that he was moving his limbs, a right hemiparesis was obvious Everyone was however, still convinced the child was blind A photograph taken at this time (fig 10) illustrates these points, but also indicates how bad the child s condition had been when at its worst since all observers were agreed that by now he was very much better

The injections of P.P.D were continued until October and except for the reactions which followed each one, and which were now quite trivial, the child improved steadily By the

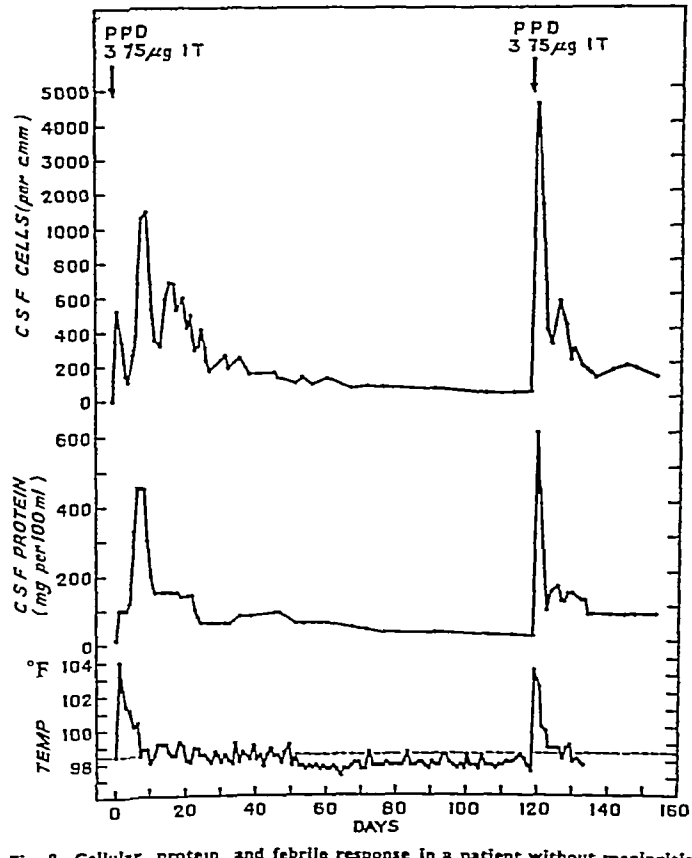


Fig 8—Cellular protein and febrile response in a patient without meningitis who received five times the dose shown in figs. 6 and 7—i.e., 3 75μg P.P D., by intrathecal injection Mantoux test positive to 0·1 ml. O T 1/1000 Injection repeated after many weeks Both injections caused a dramatic rise in cells and protein accompanied by fever and vomiting

of tuberculin present, or the tuberculin may be adsorbed on the cells and thus removed from the filtrate

3 The third approach was to choose a patient in whom the regular treatment with streptomycin had obviously failed and in whom the cell fluctuations had disappeared, and to find out whether an intrathecal injection of P P D would reproduce the cell and protein fluctuations seen earlier in the illness As it chanced we had two such patients under our care during the summer of 1949 The effects of the intrathecal injections of P P D and the subsequent events merit a full description

FIRST CASE (fig 9)

A boy, aged 1 year 10 months, was admitted to Peppard Sanatorium on April 1, 1949, under the care of Dr Harley Stevens He had a very strong family history of tuberculosis, his maternal uncle had died of pulmonary tuberculosis, and a first cousin of tuberculous meningitis A maternal aunt was undergoing sanatorium treatment and his mother has since been admitted to a sanatorium, both with pulmonary tuberculosis The patient himself had been quite well until seven weeks before admission, when he developed measles, from which he never seemed to recover He had a persistent fever, grew thinner and more apathetic, and was very constipated At the end of March radiography of chest showed diffuse mottling through both lung fields, shortly afterwards his neck was found to be stiff and he was sent into hospital with a diagnosis of miliary tuberculosis and tuberculous meningitis

Course of Illness

On admission he was ill and wasted His head looked too large for his body, and although he was nearly 2 years old the anterior fontanelle was widely open though not unduly tense He was very drowsy and apathetic and yet irritable When undisturbed he would lie quietly, but he would cry miserably when touched or moved. Movements of his eyes seemed to be full, and he moved his limbs normally The tendon reflexes were within normal limits, but both plantar reflexes were extensor Lumbar puncture yielded fluid under a very high pressure containing 100 cells per c mm, with 162 mg protein and 680 mg chlorides per 100 ml (sugar not estimated) Scanty acid fast bacilli were seen on smears

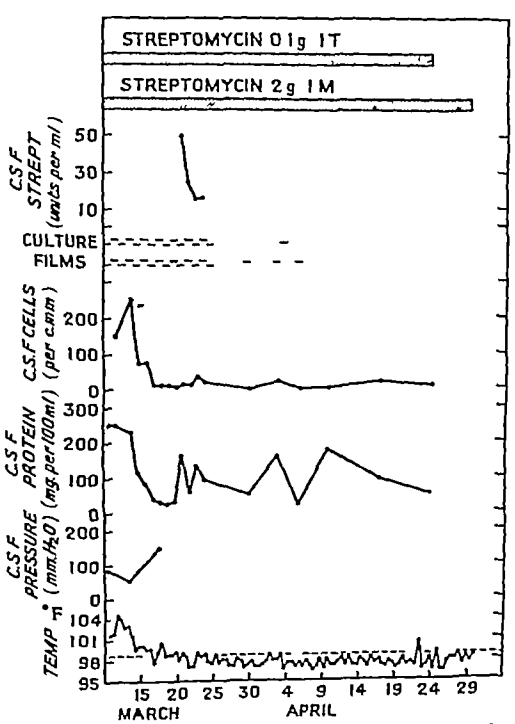


Fig 5—Similar graph in a case of probable polio-encephalitis in which a mistaken diagnosis of tuberculous meningitis was made and treatment with intramuscular and intrathecal streptomycin was therefore begun Note the absence of spikes of cells and protein which contrasts strongly with the curves in figs 2 and 4

Treatment with streptomycin was begun immediately the child received a daily lumbar injection of 50 mg, 0 25 g twice daily by intramuscular injection. In the first two weeks he grew a little better, the vomiting lessened, he took fluids well by mouth, he did not vomit his nutrition improved slightly During the third week treatment the improvement flagged, lumbar puncture became difficult, and the C S F was bloodstained During the fourth week he grew worse, he vomited frequently and the stiffness increased Lumbar puncture now yielded fluid containing 130 cells per c mm, with protein 177 mg, chlorides 655 mg and sugar 43 mg per 100 ml Acid fast bacilli still present on the direct smears

On May 4, 1949, the child was transferred to the Radcliffe Infirmary, Oxford, because it was feared that he was developing a spinal block and neurosurgical intervention was indicated He was now extremely ill and his skin was dry with diffuse brown pigmentation Though the circumference of his head was within the limits of normal the fontanelle measured 2 5 by 2 cm, and radiography of the skull showed slight expansion of the sagittal suture There was gross neck stiffness with considerable head retraction When left alone he would usually lie quietly curled up on one side with all four limbs flexed, but from time to time he would utter a loud cry like an animal There was constant chewing, sucking, and grinding of the teeth. The fundi were normal he would follow objects with his eyes, and the pupils, though

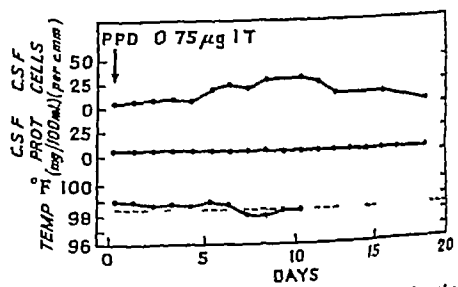


Fig 6—Cell and protein content and temperature following the intrathecal injection of 0 75μg P P D in a patient without meningitis and in whom the Mantoux test was negative to 0·1 ml O T Cellular No disturbance of temperature or protein content negligible

dilated, reacted briskly to light There was a mild facial weakness and possibly some weakness of his right limb, but he was so reluctant to move that it was hard to be sure of this The spleen was easily palpable, and radiography of the chest still showed marked miliary changes. Gastric washings grew tubercle bacilli on culture

Lumbar puncture was performed in the three lower lumbar spaces and confirmed the impression of incipient spinal block The C S F was heavily mixed with old blood and could not be obtained (with great difficulty) by aspiration Accordingly bilateral frontal burr holes were made to give access to the lateral ventricles, and a course of intraventricular injections (50 mg daily) of streptomycin was begun The first specimen of fluid obtained contained 43 cells per c mm and 12 mg protein per 100 ml, and tubercle bacilli were grown in culture As vomiting was persistent, an intravenous drip was set up, physiological saline was given first and blood later

Despite these measures the child grew worse During the next nine days the protein in the lumbar fluid rose to 1 g per 100 ml and thereafter all attempts at lumbar puncture resulted in dry taps The protein in the ventricular fluid also rose to 500 mg per 100 ml (fig 9) He was persistently feverish, the wasting, head retraction, and hydrocephalus all increased until by the middle of June his condition was hopeless and the intrathecal injections of streptomycin were accordingly abandoned This was the more disappointing in that X ray films of the chest showed slight improvement and cultures of gastric washings were now negative

At this time his head was so retracted that it rested between his shoulders He was dreadfully wasted, and in spite of being turned frequently he had developed several bedsores His skin was deeply pigmented and covered with long lanugo like hair The fontanelle was full and bulging radiography of the skull showed increased expansion of the sutures and on one recent occasion C.S F had leaked spontaneously from one of the burr holes Ventricular puncture

Fig 10

Fig 11

0—(Case I) Photograph taken two months after first intrathecal injection of D The enlargement of the head and the fixed flexion attitude of the legs are n but the head-retraction though still present has lessened the pressure e over the left trochanter has healed he is losing the downy hair which had ered his whole body, and can move his left arm

11—(Case I) Photograph taken a year later

Unfortunately this photograph was reversed and it is in fact the right hand—the one previously paralysed—that the child has lifted to its mouth—H.S

streptomycin was given into left ventricle After this the a grew lighter next day he d obey simple commands and the following day he began to k.

or three months he slowly im red. For weeks he was intensely able but he gradually grew e rational, though he remained tionally unstable By the middle June he had gained about 6 lb weight and had no abnormal ological signs He still looked thin and frail and psychometric suggested about a 20% loss in tion

ie behaviour of the cells and in in the c.s.f was typical 12) The cells had shown a few uations during the first three s of treatment (maximal rise 165 to 600 per c mm in twenty hours), and the protein rose ng the same time from about to 400–500 mg per 100 ml protein then stopped rising and cell fluctuations flattened out rele bacilli were present on films and culture for six con ive days and then disappeared per during the sixth week treatment the protein content to fluctuate almost daily (maxi rise from 420 to 740 mg per ml in twenty four hours) and ar though less frequent fluc ns reappeared in the cell curve the forty ninth day of treatment acid fast bacilli were once again seen on smears and on the fiftieth day the cells shot up to 950 per c mm (32% polymorphonuclears) The daily intrathecal injections were therefore continued for another eight weeks from this time

At the end of June it was decided to give him a rest from the intrathecal injections, but, in view of the severe chest lesion, to treat him with the prolonged régime we were then using in cases where the meningitis was accompanied by an overt miliary spread (Cairns, Smith, and Vollum 1950) The decision to withhold the intrathecal injections even temporarily was taken with some trepidation for, though the c s.f fulfilled the criteria laid down for stopping treatment (Cairns, Smith, and Vollum 1950), and though his clinical condition was reasonably good, he was no longer gaining weight and he still had a low grade fever We were also influenced in favour of giving him a rest by the fact that after 105 consecutive intrathecal injections he had become extremely intolerant of his lumbar punctures, which were by now a severe ordeal for all concerned

But after about two weeks it became only too apparent that the boy was losing ground. During this time the left knee became swollen and painful, and our orthopædic colleagues had no hesitation in making a diagnosis of tuberculous arthritis The joint was immobilised by a plaster splint but remained as big as ever After seventeen days the intrathecal injections were begun again, but the boy grew worse increasingly rapidly He vomited frequently and grew dreadfully wasted, his neck and back became extremely stiff, he lay in a light stupor all day but, when asked, he complained of severe headache The pressure in the c s f rose to over 300 mm H_2O and was only controlled for a few hours by decompressive lumbar taps No further tubercle bacilli were obtained on film or culture

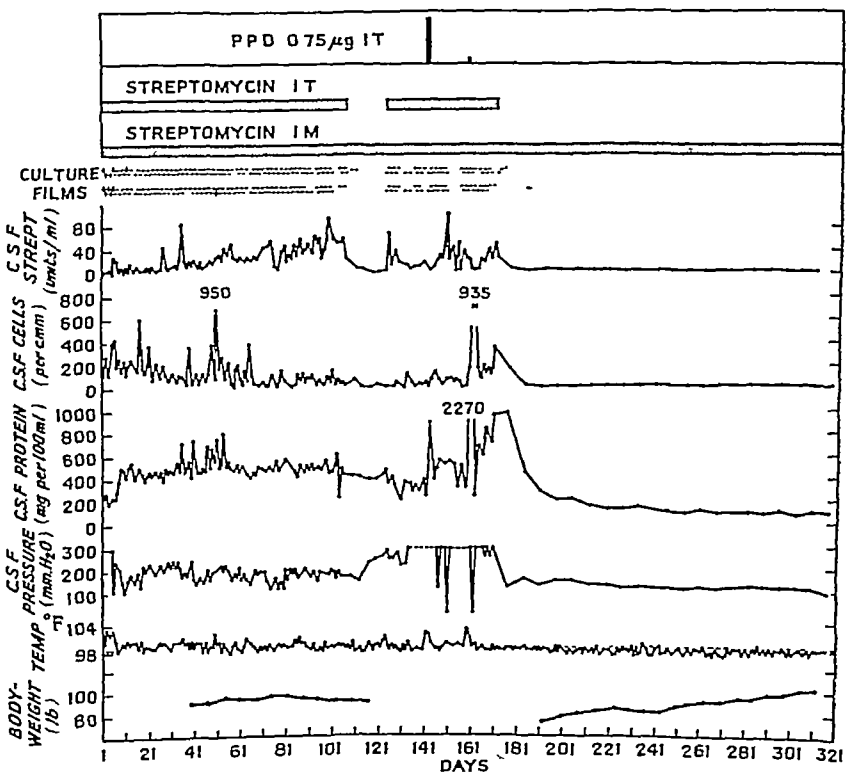


Fig 12—Graphic representation of the course of the illness in case 2. For explanation see text.

middle of September it seemed that his sight was returning and by the beginning of October he could obviously see quite well He was now a well covered, rosy little boy, playing happily with his toys and beginning to talk, though still resentful of being moved Movements of both arms were normal but his legs were still very stiff and perpetually flexed He could move his feet but not the knees or hips There was a well maintained clonus at the right ankle, but both plantars were now flexor X ray appearances in the chest were within normal limits

During November, after six months of persistently dry taps, lumbar puncture once more yielded C S.F , though the flow was still extremely slow The cisternal C S F was by now approaching normal Radiography of the skull showed that the sutures were normal and the fontanelle nearly closed By January he could feed himself and could pull himself up on to his knees By February he could stand and in March he learnt clean habits

By April 1, 1950, just one year after treatment was begun, he was a fat healthy looking little boy who could walk holding on to someone's hand (fig 11) There was a mild flexion contracture of the right hip and knee, a legacy of the old hemiplegia, but except for the unsteadiness of gait there were no abnormal neurological signs There was free flow of C S.F on lumbar puncture and both the lumbar and cisternal fluids were normal in all respects (protein 28 mg per 100 ml., 3 cells per c.mm) His vocabulary, though still very limited, was increasing, and psychometric tests confirmed the impression that he was rapidly making up the ground he had lost during his long and serious illness

This child, who had a proved tuberculous complicated by an overt miliary spread, worse in spite of intensive treatment with given by the lumbar, ventricular, and routes When his condition appeared intrathecal streptomycin was withheld amounts of P P D were injected first into and then into the cisterna magna in order effect this had on the C S F These inje produced the expected rise in the cell and of the C S.F but also a totally unforeseen clin ment We therefore sought opportunity to injections of P P D in another case in which streptomycin had failed

SECOND CASE (fig 12)

A boy of 17½ years was admitted to the R on March 25, 1949, under the care of Dr P C for an attack of bronchitis when he was 3, his past uneventful and there was no family history of and no history of contact He had been until a week before admission, when he developed cold in the head and a little later began to vomit complain of headache The headache and rapidly worse, and for the last four days before had vomited everything he had swallowed He increasingly drowsy

Course of Illness

On admission he was deeply stuporous, but roused show that be interference pale and thin, was very stiff, and Ker ning's sign was pos Apart from a slight left facial weakness there were no focal neurologic signs Lumbar yielded a faintly fluid under a of 300 mm. H_2O containing 120 cells c mm., with protein mg, chlorides 600 and sugar 47 mg 100 ml Acid fast were seen on the smear, tubercle were grown on and guinea pig inoculation was positive Radiography showed tensive infiltrative of the left mid zone enlargement of the glands

On March 24, 14 treatment was 1 g of streptomycin given twice daily intramuscular and 100 mg daily by bar injection. next few days he worse, and by March was comatose, responding to stimuli Because deterioration both tricles were through bilateral burr holes Both capacious and ally placed, the pressure was H_2O and tubercle were seen on were cultured from ventricular fluid. daily intrathecal

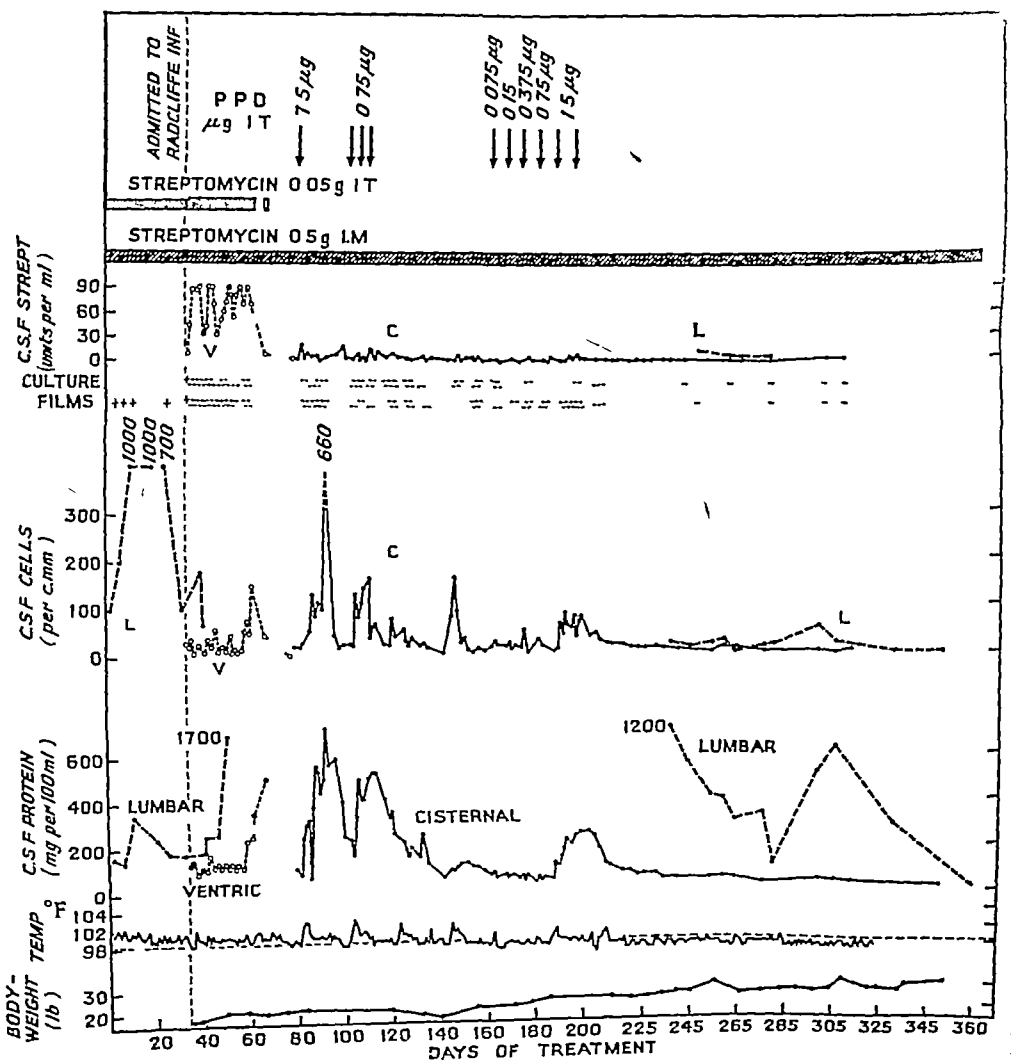
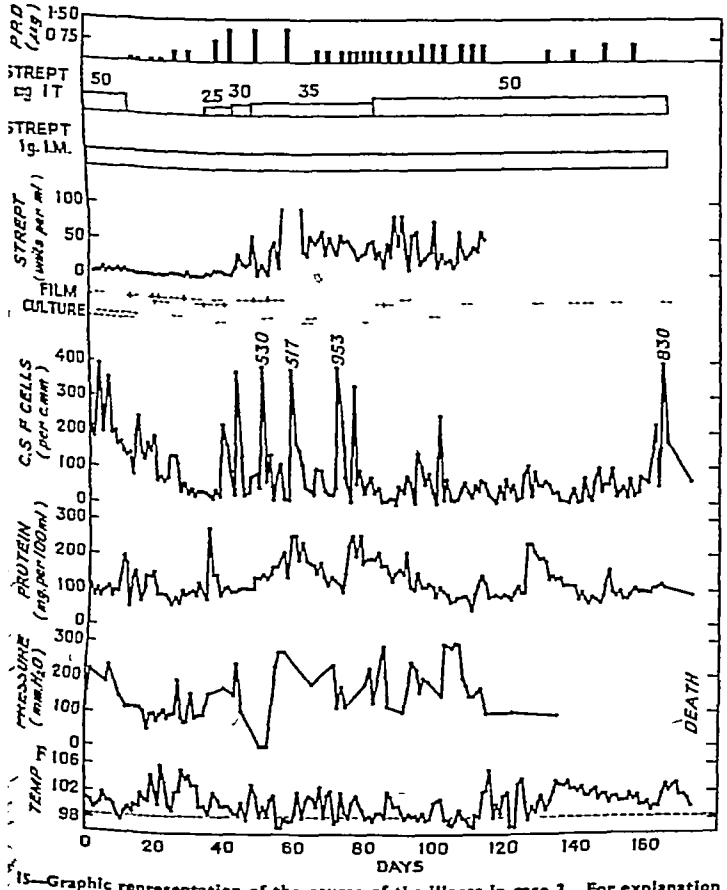


Fig 9—Graphic representation of the course of the illness in case 1 For explanation see text.

ird injection the axillary temperature rose to 106 F
ı this minute dose caused no significant rise in cells
t 25 the intrathecal streptomycin was again begun
ie of the persistently positive films Three days later
se of P.P D was increased to 1 25 μg and from then on
t every injection was followed not only by an exacerba
f signs and symptoms but by a sharp rise in the cells
ften in the protein (fig 15)

ı child remained extremely intolerant of the intra
l P.P.D, which even in minute doses would cause an
ie exacerbation of the opisthotonus and an access of
fits As the weeks passed, however it became apparent
each reaction was followed by slight improvement
emperature settled, the depth of coma lightened, crying
owing, and coughing all returned, the opisthotonus
y disappeared, and the extensor posture of the limbs
finally replaced by one of flexion Though the child
very thin, she never showed the extreme wasting asso-
d with chronic meningitis and all the pressure sores
d except one which had become heavily infected with
domonas pyocyanea Most surprising of all, the C S F
ure remained within normal limits during the whole
ss, and the obstructive hydrocephalus, hitherto invariably
in decerebrate rigidity, never developed Sight, as judged
he persistence of a brisk menace reflex, was preserved
ughout The Mantoux test became negative to 0 1 ml
1/10

t this stage, however, the improvement stopped It
ned therefore that, though the meningitis was controlled,
ere and widespread cerebral infarction, which was preclud
any useful recovery, must have taken place at the time the
erebrate state appeared Ventriculography, which was
formed on the 170th day of treatment, supported this
clusion. The whole ventricular system was grossly but
ametrically enlarged while the sutures were all within
mal limits After this procedure the child's chest became
y bubbly and she died of inanition twenty five weeks after
atment was begun



15—Graphic representation of the course of the illness in case 3 For explanation see text.

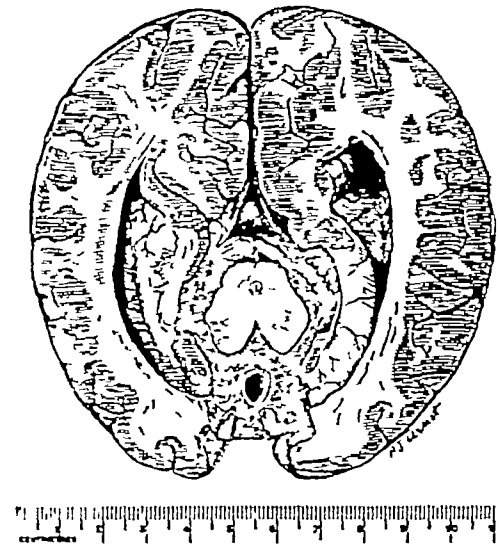


Fig 16—Drawing of brain cut through the cisterna ambiens showing the dense exudate hitherto invariably seen in cases showing the decerebrate picture The patient became decerebrate and died after five months treatment with streptomycin.

Post mortem Findings

The skull was normal, with no spreading of the sutures The meninges at the base of the brain were thickened but macroscopically there was no exudate in the cisterna ambiens or Sylvian fissures (figs 16 and 17) There was widespread bilateral infarction of the basal ganglia and external and internal capsules These infarcts were old and shrunken and appeared to correspond well in time with the onset of the decerebration. The severe ventricular enlargement was secondary to the gross destruction of brain tissue There was a small, firmly encapsulated tuberculoma in the right Sylvian fissure which may well have acted as a "Rich's focus" (Rich and McCordock 1933, Rich 1944) (fig 18) In the lungs there was a well calcified primary complex, but no sign of tuberculosis elsewhere

Microscopic examination showed several small foci of tuberculous granulation tissue in the interpeduncular region and a larger focus lying beside the left optic nerve In many places there was cuffing of the penetrating vessels of the brain with chronic inflammatory cells and macrophages The white matter of the cerebral hemispheres and cerebellum showed microcystic spaces and small focal collections of fat granule cells the terminal result of focal demyelination. There was a fairly widespread granular ependymitis The basal ganglia showed gross damage with very numerous microcystic spaces and fat granule cells

This case is unique in our experience in that the child not only lived for twenty-three weeks after developing the full decerebrate state but showed a sustained objective improvement, though this never amounted to a useful recovery The necropsy findings were also unique, for in every other case in which the decerebrate state developed the cisterna ambiens was invariably choked with exudate of almost cartilagenous density (fig 16) Indeed this has with one exception, been a constant finding in all the cases in this series that have come to necropsy

Fig 13—(Case 2) Photograph taken two weeks after the first intrathecal injection of P P D The top of the plaster immobilising the left knee can be seen

Response to Tuberculin

By Aug 10, after three weeks of the second course of intrathecal injections, the outlook seemed so hopeless that it was seriously considered whether all injections should be withheld so that the boy might die in peace Instead, 0 75 μg P.P D —i e, a tenth of the original dose given in case 1—was injected by lumbar puncture on both Aug 11 and 12 In this case the intrathecal streptomycin was continued so that all the readings of the C S F should be comparable As in case 1 the temperature rose abruptly twenty four hours after the first injection, and twenty four hours later the C S F became yellow and the protein shot up from 240 to 880 mg per 100 ml The rise in cells was much less dramatic and was only from 60 to 140 per c mm on the fourth day In this case the clinical disturbance was most alarming Together with the rise in temperature he vomited persistently and complained that his neck and back were very painful and stiff and that he felt very ill He then rapidly went into profound coma and for twelve hours looked as though he was going to die However, during the next few days the coma lightened persistently, and twelve days after the injections he was better than he had been for weeks He was able to sit up in bed and read the newspaper, he was no longer incontinent, and on two occasions the lumbar pressure was within normal limits (fig 13) However, during the third week his improvement flagged, the vomiting and intense drowsiness returned, and the C S.F pressure was once again persistently above 300 mm H_2O

Seventeen days after the first two injections of P.P D a third lumbar injection was given, but of only a tenth of the original dose—i e, 0 075 μg P.P D Again there was a prompt clinical response which, though severe, was not as alarming as after the previous injections The response in the C S F was even more dramatic The cells rose from 16 to 935 per c mm (80% polymorphonuclears) in forty eight hours and the protein to over 2 g per 100 ml On the third day the fluid was brown and difficult to obtain, and spinal block seemed about to supervene This immediate disturbance in the cells and protein settled down within forty eight hours, but the boy remained drowsy and incontinent, and after first falling the protein again rose

Recovery

Twelve days after the injection the boy was no better, and accordingly it was decided to abandon all further intrathecal therapy The day after this decision was taken he began to improve The cells, protein, and pressure all fell persistently and permanently, the boy stopped vomiting and began to eat The effusion in the knee disappeared leaving full movement of the joint, and radiography showed considerable improvement in the chest During October he gained 12 lb, and from then on his improvement has been uninterrupted

On Feb 6, 1950 he was transferred to Peppard Sanatorium, and at the end of March the intramuscular streptomycin was stopped He is now (May 1950) free from all neurological signs and symptoms, and the C S.F is approaching normal The lung lesion, however, is still active and an artificial pneumothorax has been induced Mentally his recovery appears complete (fig 14)

In this case, as in the first, intrathecal P P D produced a severe but temporary ex of the meningeal symptoms which was quickly by a rise in the cell and protein content of the This disturbance in the C S.F resembled that so seen in the first weeks of intrathecal treatment streptomycin, in particular the C S.F reaction the third injection of P P D in case 2 was quite like that which coincided with the isolated film obtained at the end of the seventh week treatment (fig 12)

More startling was the improvement seen in which was as gratifying as it was unexpected intrathecal injections of P P D, though possibly peutic, were certainly dangerous, at least in the used in these two Any further trial had to be carried out case in which treatment streptomycin had ther to offer Ac a patient showing the decerebrate picture deliberately selected as example of the one con tion in which no ment of any kind had been seen with st alone Further, in the selected the infection obviously very active judged by the numerous and fast bacilli seen on smears of the C S.F, while in cases 1 and 2 organisms had disappeared weeks before the P.P D was first given

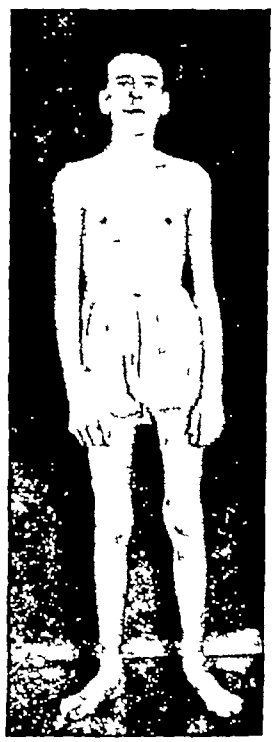


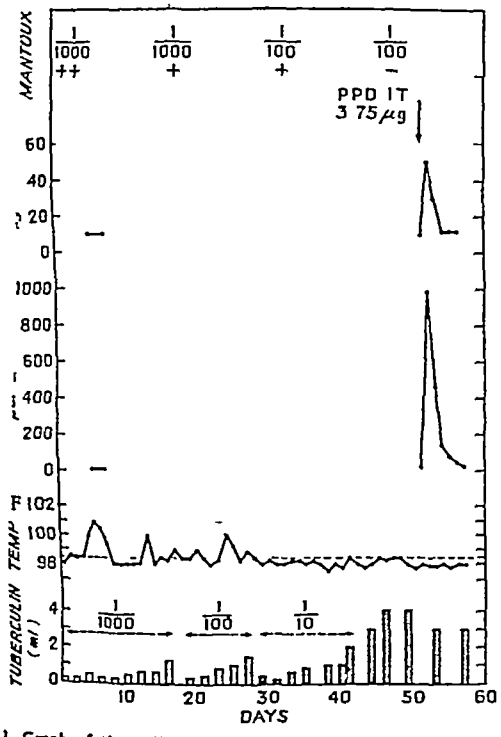
Fig 14—(Case 2) Photograph taken fifteen months after treatment was first begun

THIRD CASE (fig 15)

The patient, aged 5½ was admitted to the Mil Hospital for Head Injuries Sept 18, 1949, with a weeks' history of drowsi anorexia, and vomiting admission she was semico tose and unable to spe Her neck was stiff, t were constant athetoid mo ments of the right and she had a spastic left hemiparesis The C.S.F tained 212 cells per c mm (43% polymorphonu with 122 mg protein, 30 mg sugar, and 772 mg chl per 100 ml Radiography of the chest showed a ca primary complex Brain abscess was excluded by bil ventricular estimation and treatment with strep begun (50 mg daily by lumbar injection, 0 5 g twice d by intramuscular injection) In spite of this the child g rapidly worse She became profoundly comatose incessant chewing and sucking She was unable to c cry, or swallow and had to be fed by stomach tube skin broke down over the pressure points, the stiffness neck and back progressed to severe opisthotonus, and legs and the right arm assumed the tonic extensor p Shortly afterwards the left arm also became extended hyperpronated and the decerebrate picture (cf fig 1) complete Tubercle bacilli were identified in the C.S.F the fourteenth day of treatment

Response to Tuberculin

On Oct 2, 1949, the fifteenth day of treatment, the in thecal injections of streptomycin were temporarily with so as not to confuse the effects of the intrathecal P.P D. Mantoux test at this time was weakly positive to 0·1 O T 1/100,000 As the initial reactions in cases 1 and been so severe only 0 0075 μg P P D was introduced at first injections, and the dose was then gradually All the injections caused an increase in the fever, and



1—Graph of the cells protein and temperature in a patient sout meningitis Mantoux test positive 0 1 ml O T 1/1000 amuscular injections of increasing amounts of O T were given 1 4 ml O T 1/10 was tolerated without disturbance and the itoux test was negative to 0 1 ml O T 1/10 During a systemic ction the C.S.F remained normal, but an intrathecal injection 75 μg given after the Mantoux test had become negative still a brisk meningeal response (cf figs 7 and 8)

ndard" solution of P P D is made up containing 7 5 μg ml and this is further diluted 10 fold, 100 fold, and fold. If the Mantoux test is strongly positive, then ml. of the 1000 fold dilution is injected intrathecally and amount is doubled every other day until a reaction is ned

the Mantoux is weakly positive to O T 1/1000 or more 1 0 ml of the 1000 fold dilution is injected and the dose first trebled or even quadrupled every other day, depend on the strength of the Mantoux reaction. When we are ng 0·5 ml. of the 100 fold dilution we increase the dose more iously in order to avoid too severe a reaction

nce a reaction is obtained, as shown either clinically or rise of the cells and protein in the C S.F, the same dose is ted. From then on the size and timing of each injection ided on according to the severity of the last reaction he whole it has seemed wiser to give the injections every or fourth day so as to allow two or three days free l fever and vomiting The dose is gradually increased e patient becomes more tolerant of the injections

ne reactions consist in an acute exacerbation of the ingeal signs and symptoms At the worst they are emely alarming and include profound coma, an ise rise in intracranial pressure requiring repeated ricular taps, rhythmic respirations, hyperpyrexia fits of tonic extensor rigidity They have so far mercifully short lived and about twenty four s after the injection the patients have begun to ove

e do not yet know how long the injections of tuber should be continued, but we have stopped only when atients have become convalescent and are free from gns and symptoms of active meningitis

e history of tuberculin teaches one of the sharpest in medicine on the dangers of premature publica We are only too well aware how incomplete this 7 is But now that tuberculous meningitis has me such a long-drawn out disease it will be at least ner year or eighteen months before the place of tuberculin in treatment can be assessed We are therefore putting forward this interim report in the hope that other workers in the same field will extend our observations

SUMMARY

When tuberculous meningitis is treated for a long time with intramuscular and intrathecal streptomycin, between 50% and 60% of patients recover But the mortality has not been further reduced and in the individual case the prognosis remains uncertain

The fluctuations of the cells and protein in the C S F during the first few weeks of streptomycin therapy suggests that tuberculin is liberated into the C S F

In patients without meningitis but sensitised to tuberculoprotein, as shown by a positive Mantoux test, an intrathecal injection of minute amounts of the purified protein derivative of tuberculin (P P D) produces fever and vomiting and also a pleocytosis and a rise in protein in the C S F indistinguishable from the changes seen in untreated tuberculous meningitis Rather larger doses reproduce the changes seen in cells and protein when tuberculous meningitis is treated with streptomycin In patients in whom the Mantoux test is negative there is no clinical response and the disturbance of the C S F is negligible

C S F collected during the first few weeks of streptomycin therapy and (after Seitz filtration) injected into the skin gives no reaction The result of intradermal injections of C S F collected and filtered twenty four hours after an intrathecal injection of P P D is also negative Possible reasons for this are suggested

In certain cases of tuberculous meningitis in which streptomycin has failed to effect a cure, the C S F becomes sterile and the fluctuations in the cells and protein disappear In two such cases the intrathecal injections of P P D, given when the patients were apparently moribund, reproduced the rise in cells and protein seen typically during the first few weeks of streptomycin therapy In both patients these injections were followed by a totally unexpected recovery which appears to be complete over a year after treatment was first begun

Intrathecal injections of P P D were given in a third case in which the full decerebrate state had developed The illness was prolonged for six months and a definite objective improvement was seen though this never amounted to a useful recovery At necropsy, no exudate was seen macroscopically surrounding the brain stem—a finding unprecedented in our experience Microscopy showed several small foci of tuberculous granulation tissue in the cisterna interpeduncularis and one large focus lying beside the left optic nerve

In all three cases severe exudate must have been present and have resolved after the P P D was given It is therefore suggested that the effects of tuberculin should be further explored now that any consequent spread of infection can be controlled by giving streptomycin at the same time

The necessity for giving P P D directly into the C S.F is briefly discussed

Combined treatment with intrathecal P P D and streptomycin has been begun in seven other cases selected as having a bad prognosis It is still too early to assess the results but there has been only one death in the first three months of treatment This compares favourably with the results on streptomycin alone

The dangers of intrathecal injections of tuberculin in the presence of active meningitis, and the precautions to be taken, are emphasised.

We would like to express our gratitude to those who have made this study possible and especially to Captain N D

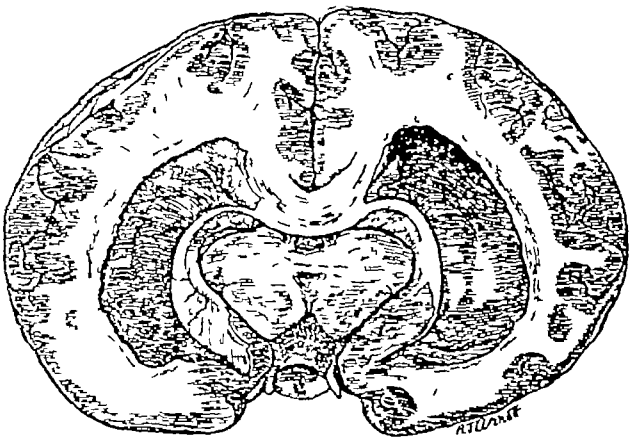


Fig 17—(Case 3) Drawing of similar section to fig 16 The basal meninges are thickened but the cisterna ambiens is free from exudate

DISCUSSION

In these 3 cases the effects of the intrathecal injections of P P D on the cells and protein of the C S F faithfully reflected the changes so commonly seen during the first weeks of treatment with streptomycin Exactly similar changes could also be produced at will in subjects without meningitis but sensitised to tuberculoprotein, provided enough P P D was given With smaller amounts the changes in the C S.F were indistinguishable from those of untreated tuberculous meningitis

Even more interesting, in all 3 cases an entirely unprecedented clinical improvement took place The inference is inescapable that intense exudate had developed in all in spite of vigorous treatment with streptomycin, and that it had resolved after the P P D was given

How this resolution was brought about is a matter of conjecture What these patients in fact received was tuberculin therapy given under a cover of streptomycin Koch himself, when he first announced the discovery of tuberculin, said "There is no question of a destruction of the tubercle bacilli in the tissues, but only that the tissue enclosing the tubercle bacilli is affected by the remedy" and again "The remedy does not kill the tubercle bacilli but the tuberculous tissue" (Koch 1890) [4] The hysterical enthusiasm provoked by Koch's paper was quickly followed by an almost equally hysterical rejection of the man and his "remedy" But in spite of the vast amount of careful work that followed the period of "tuberculin delirium" (Hamman and Wolman 1912) the therapeutic value of tuberculin could never be proved while its dangers were incontrovertible Just two months after Koch's announcement Virchow (1891) demonstrated the post mortem findings in certain cases treated with tuberculin and showed intense and wide spread dissemination, and severe local extension of the disease Now, however, we possess in streptomycin an antibiotic of proven efficacy against the tubercle bacillus It should therefore be possible to explore and exploit the effects of tuberculin while preventing any spread of infection by giving streptomycin at the same time

We are using intrathecal tuberculin as well as strepto mycin in 7 other cases of tuberculous meningitis [5] These were specially selected as having a bad prognosis 4 patients were deeply comatose and the other 3 drowsy and severely confused All had focal neurolo It is still too early to assess the results, but the ence we are gaining is encouraging Only 1 has died during the first three months of whereas on streptomycin alone, in more than half fatal cases, the patients died within the first thr

The falling response to intrathecal tuberculin case 1 has been amply confirmed in some of th cases There is little doubt these patients become desensitised (Rich and McCordock 1929, child, Friendenwald, and Bernstein 1934, Rich At the same time there is some indication that inflammatory reaction provoked by the tuberculin itself beneficial, perhaps because it activates process and brings streptomycin, or the natural and chemical defence mechanisms, into closer with the site of infection

Whether or not it is necessary to give directly into the C S F is a question now being inve gated in man and guineapigs [6] Preliminary strongly suggest that intrathecal injections are We have several times seen attacks of fever and after intramuscular injections of tuberculin in patien with normal meninges Throughout these system reactions the C S.F has remained normal in all respe On the other hand, and conversely, when repeated intra muscular injections were given until large amounts tuberculin were tolerated without any disturbance what over, and the Mantoux test had become negative to 0·1 ml O T 1/10, an intrathecal injection of P.P.D provoked a dramatic rise in cells and protein (fig 19).

One thing, however, is very certain Intrathecal injections of P P.D in the presence of active menin are potentially *extremely dangerous* Further, the severity of the reaction is to some extent unpredictable, especially if for any reason the P P.D has been withheld for a few weeks The closest supervision of cases and daily analysis of the C S F are essential if disaster is to be avoided We are at present using the following sch of treatment in an attempt to produce a tuberc reaction as quickly and as safely as possible

On admission 0 1 ml O T 1/1000 is injected intradermally Then, as soon as the diagnosis is confirmed, bifrontal bur holes are made if this has not already been done

4 Nun so viel steht fest dass es sich nicht um eine Abtötung der im Gewebe befindlichen Tuberkelbacillen handelt sondern dass nun das Gewebe welches die Tuberkelbacillen einschliesst, von der Wirkung des Mittels getroffen wird Das Mittel tödtet also um es noch einmal kurz zu wiederholen nicht die Tuberkelbacillen sondern das tuberkulöse Gewebe

5 A single intrathecal injection was also given in an 8th case immediately after the diagnosis had been confirmed bacterio logically The patient who had only been in hospital twenty four hours died a few hours *later from* an inhalation bronchopneumonia that was present on admission This case is excluded from this discussion because no information was gained about the action of intrathecal tuberculin

6 Systemic tuberculin has been tried in tuberculous meningitis alw by Don (1907) and Hamman and Wolman (1917), and wi streptomycin by Choremis et al (1948)

Fig 18—(Case 3) Section of brain made just above the section fig 17 The Sylvian fissures are free from exudate. An old infarct can be seen in the right basal ganglia and just below small tuberculoma in intimate contact with the Sylvian f focus)

d, for the first time a suitable sedative regime epilepsy

5 —Mr E, Eurasian aged 19 had had leprosy ever could remember Many bacilli were present

ment with thiacetazone started on April 5, with two daily and increasing to six daily, in divided doses

lts —Bacilli are still present but in every stage of ration Along with this there has been a very definite vement. At the start of treatment the patient had a y granulomatous thickening on the face trunk, and This thickening has become flatter and the skin is and more normal in appearance

can only consider an advanced case of this type ing in the initial stages of treatment However over four months' treatment has led to a con ble clinical improvement and bacillary degeneration

se 6 —Mr F Eurasian aged 40, had been treated from ry until April with a proprietary sulphone He was ely tuberculoid case and had been bacteriologically ve from the beginning His treatment with sulphones ollowed by a very pronounced deterioration in his tion he developed acute tuberculoid leprosy, with lerable depression and low fever He was next treated injections of hydnocarpus oil which appeared to have effect on his condition In the middle of April it was led to start treatment with thiacetazone Since then patient has improved with considerable rapidity After y three months treatment the lesions are hardly visible, his depression has gone

gain it can easily be argued that this case proves ung Acute tuberculoid leprosy is in many cases a sient state from which the patient may possibly ver without any treatment whatever But in the ent case the flare up was a severe one, aggravated sulphone treatment, and showed no improvement er large doses of hydnocarpus oil There is little bt in my mind that the prompt clinical response due to treatment with thiacetazone In this case dose was never more than four tablets a day

ase 7 —Mr G aged 48 had developed leprosy in a anese prison camp where no treatment was available was an advanced lepromatous case and had been given quate sulphone treatment for three years This treatment had no effect on the number of bacilli present in his ars Any attempt to raise the dose of sulphone beyond mary limits had led to extreme nerve pain The patient been extremely depressed and had recently felt that his atment was not doing him any good

Treatment —On April 5 sulphone treatment was suspended, the patient was given thiacetazone starting with two lets daily and going on to four daily in divided doses re has been some clinical improvement but not much number of bacilli has definitely decreased, and the nerve tion has disappeared

his is one of those very difficult and highly resistant s which do occur under sulphone treatment but are commonly recorded In the last three years the ent has had different proprietary sulphones and a t term of treatment with *p* aminosalicylic acid The drug which seems to have produced any clinical efit is thiacetazone

ase 8 —Mr H, aged 40 had had virulent and advanced omatous leprosy for at least twelve years A lepromin was negative and the patient when first seen at the ning of March, was suffering from violent lepra fever a temperature of 103°F and extreme depression He n with two tablets of thiacetazone daily, and the dosage since been increased to five tablets daily He is still riologically positive, but the lepra fever has disappeared the change in his clinical and psychological condition siderable

se 9 —Mr I, Eurasian, aged 19 was first seen over a ago he had had virulent leprosy for more than ten After a year s treatment with sulphone he had oved very considerably and showed scanty bacilli, but his lesions were still obvious At the beginning of May, 1950, treatment with thiacetazone (four tablets daily) was begun The result has been rapid and dramatic The patient said I don t seem to be able to recognise myself on looking in the mirror I do find the markings on my face going away completely" The last bacteriological smears showed no bacilli

Case 10 —Mr J aged 20, who had come to this country from West Africa, had lepromatous leprosy, with lesions on the face and chin He had had no previous treatment of any kind He was treated with thiacetazone for three months the dosage starting at two tablets daily and increasing to six daily The clinical improvement has been quite remarkable the patient has become bacteriologically negative, and there is no clinical evidence of leprosy, the granulomata having completely disappeared

COMMENTS

A study of the effects of any drug on leprosy after only four months' treatment is utterly inadequate for any real assessment of its value It will be noted, too, that the present cases were all of an advanced and virulent type many having undergone years of mis diagnosis, improper treatment, and neglect I am however, prompted to publish this preliminary report because of the initial success with thiacetazone, and in the hope that others who have more clinical material may be led to test this remedy None of the present patients could expect a clean bacteriological and clinical bill of health under a minimum of two years' treatment with sulphone

Thiacetazone seems to have three advantages'

(1) Under sulphone treatment clinical improvement in advanced leprosy does not normally occur in under a year, and bacteriological improvement comes even later In each of the present cases with one possible exception (case 4), there seems to have been definite clinical amelioration and some bacteriological improvement within four months of the start of treatment This is not a period in which any analogous effects would be expected from sulphone treatment

(2) Published reports of the sulphone treatment of leprosy have hitherto neglected to mention the mental depression and slowing of cerebration which so often attend its administration Indeed they are not always obvious except where the patient is doing intellectual work Thiacetazone seems to be completely free from this handicap and the difference in the mental demeanour of patients who have been given thiacetazone after having been previously treated with sulphones is striking

(3) So far as can be ascertained in the present small series thiacetazone, in the doses recommended here, seems to be relatively free from toxicity There has been no evidence of anæmia or of hæmolysis, and no tendency to lepra fever, which is a very present danger with sulphone treatment It is usually considered necessary that patients under sulphone treatment should have their blood examined at least once a month, but in my small series this was unnecessary with thiacetazone

CONCLUSION

It is obviously far too soon to make anything more than a tentative assessment of the early effects of treatment But the clinical and bacteriological effects of thiacetazone, as recorded above, and its apparent lack of toxicity, suggest that it is well worth fuller study

I am deeply indebted to Dr W A R Thomson for a considerable number of discussions about dosage and general treatment with thiacetazone and to the Royal Free Hospital, London for the laboratory investigations Messrs Boots Pure Drug Company supplied the thiacetazone

REFERENCE

Lancet (1950) Leading article 1 264

Frazer, of the Military Hospital for Head Injuries, and to Dr R W Armstrong, Miss A McGibbon, and Mr W A Macdougal, of Littlemore Hospital, and also to Mr A Scott, of the Peppard Sanatorium, for help with the photographs

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THIOSEMICARBAZONE IN THE TREATMENT OF LEPROSY

GORDON A RYRIE
M.A., M B Edin
MEDICAL SECRETARY, BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION

SINCE *Mycobacterium lepræ* cannot be cultivated either in vitro or in vivo, research on the treatment of leprosy often follows along lines that prove hopeful in tuberculosis Certain of the thiosemicarbazones seem to exert, in certain circumstances, a specific effect on *Myco tuberculosis*, including changes in the morphology and staining power of the bacillus, an action on the toxins of tuberculosis, and regressive changes in tuberculous lesions (*Lancet* 1950)

In the early part of this year I was approached by Sir Jack Drummond, F R S, and Dr W A R Thomson, of the research and medical departments of Boots Pure Drug Company, with the suggestion that it might be of value to investigate the effect of the thiosemicarbazones in leprosy

The present study is of the exhibition of 'Thiacetazone' (*p* acetylaminobenzaldehyde thiosemicarbazone) in ten cases of leprosy in Britain Eight of these cases were of a virulent lepromatous type, two of them were of the chronic tuberculoid type In all cases the dosage started at 50 mg of thiacetazone, and this has been raised over a matter of 4–8 weeks to 150 mg daily Since thiacetazone is made up in tablets each containing 25 mg of the drug, the preliminary dose is represented by two tablets, the biggest dose being six tablets The latter doses have all been given at divided periods throughout the day

CASE RECORDS

Case 1 —Mrs A. aged 44, had had lepromatous leprosy for six years, the disease having first appeared as lepromatous lesions on the forehead, face, thighs, and legs, which were all thickened, raised, and yielded leprosy bacilli A lepromin test was negative In my estimation, under expert sulphone treatment she would have required a minimum of 2½ years' treatment before she became clinically and bacteriologically negative

Treatment with thiacetazone was started in the second week of March, beginning with two tablets a day and increasing by one tablet a week to six tablets On six tablets the patient said that she felt some gastric uneasiness, so the dose was reduced to five tablets, and she has made no complaint since

Result —Improvement was rapid After four weeks' treatment the patient became bacteriologically negative, and she has remained so (six examinations) The lesions of and forehead have completely flattened The the thighs and legs are still visible but have much paler and flush with the surface of the skin two months the patient found that she could wear ring for the first time for a year She has shown a increase in physical energy She has been given treatment

Since the lepromin test was negative, this case one in which there was little or no specific the disease

Case 2 —Mr B, Cypriot, aged 31, had had leprosy for at least twelve years Huge indurated disfigured the whole of his face Eighteen mo had been treated experimentally with *p*-aminosalicylic After four months of this treatment he became restive, complaining that the drug was doing him He became morose and melancholy and threatened *p* Aminosalicylic acid was then stopped, and the treated for a year with a proprietary sulphone Full of sulphone were reached fairly rapidly, and slight but improvement resulted, but there was little change A lepromin test was negative

Treatment —On April 7 treatment with thiacetazone begun, starting with two tablets daily, the dose w increased to six tablets daily

Result —*Myco lepræ* are now very scanty, but appearance remains unaltered The lesions have very nitely receded, the nodules of the face in particular soft and umbilicated

It cannot be held that the result in this case psychological effect of a new treatment The has had from the very beginning complete in his doctor, and before starting sulphone treat had already read accounts in the lay press about "wonder drug" It might be held that his improve may be merely a continuation of a process ini by the previous use of sulphones, but this is unlikely, for sulphones are fairly rapidly from the system I have seen cases in which there been partial or inadequate treatment with sulpho and none of these cases has ever shown any improvement This patient has had no other drug, the change in his condition can only be attribute the effects of thiacetazone

Case 3 —Mrs C, aged 37, had had leprosy for mor ten years, with long continued lepra fever and bacteriolog positive lesions On examination she was found to be nant and had ulcers on her trunk and forehead and hyperpigmented patches all over the upper trunk had been treated for about six months with a proprie sulphone, but had got to the stage when even a single mi dose caused a violent upsurge of lepra reaction, fever and confining her to bed

Treatment —On April 7 treatment began with a tablet of thiacetazone This dose was very gradually cautiously increased to four tablets daily

Result —The patient has clinically improved very c siderably indeed The bacilli are very much less, and patient can get about and do a day's work. She still occasional transient reaction nodules, but her general condi and appearance have much improved

This case is extremely difficult to assess The could not tolerate sulphone, and her pregnancy the probability of a steady deterioration in her lep condition

Case 4 —Mr D, Eurasian, aged 19, had had leprosy as long as he could remember He also had epilepsy, attacks about twice a week.

Treatment with thiacetazone began on April 4, but patient refuses to take the drug when he thinks an of epilepsy may be imminent, and it is hard to be much he has had

Result —There is definite evidence of clinical impro and the patient looks and feels very much better *lepræ* are still present

Little or nothing can be claimed in a case like especially as, along with the thiacetazone, the

ıess of the right kidney, and infarction was suspected ıne was alkaline contained much albumin, many red ıus cells, and numerous epithelial cells, culture was Albumin and red cells were subsequently found on), 22, 25, and 29 A blood count showed Hb 13 5 g red cells 4,100,000 per c mm , leucocytes 11,650 per polymorphs 77%, lymphocytes 21%, monocytes 2%) 18, the diastolic pressure had fallen considerably, the s being 130/0

ment —In view of the patient's serious condition a of penicillin 250,000 units three hourly was begun on The dosage was increased to 500,000 units three on Oct 19, and to $2^1/_2$ mega units three hourly on Penicillin was then withdrawn, a 1 pint blood sion was given, and a course of streptomycin 1 g t d s gun on Oct 22 because of the persistent pyrexia and ıed until Nov 19, when the dosage was reduced to l. Streptomycin was withdrawn on Nov 24

ress —The patient had clinically improved on the day ng the start of streptomycin therapy The petechiæ chest and abdomen faded rapidly, and no more were ıbsequently On Oct 26 the diastolic pressure had rom 0 to 25 mm Hg The cardiac murmurs were not ntly changed Subsequent progress was uneventful ıv 7 the urine contained albumin 40 mg per 100 ml , ı microscopy an occasional red cell only was seen Some ı and giddiness developed on Nov 14 The patient was ıdy on his feet and had slight rhombergism on discharge ıospital on Jan 7, 1950 There has been no recurrence er up to now

ıe 3 (fig 3) —A girl factory worker aged 20, was ted under the care of Dr E G L Bywaters on Feb 15,

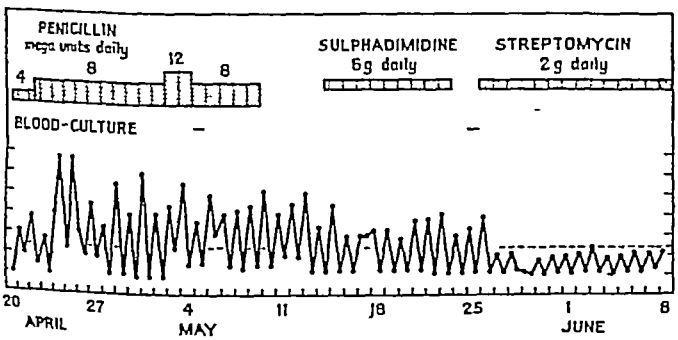

Fig 3—Temperature and treatment chart of case 3

with pyrexia and sweating , she had not responded to ·late therapy at home and had been febrile for about a . She had had rheumatic fever at the age of 7 years intermittent joint pains ever since , in view of her natic carditis she had attended a school for physically tive children

admission she was sweating and had a rapid and ɔsing pulse , there were rough systolic and diastolic ıurs at the apex, an aortic systolic murmur, and a olic murmur to the left of the sternum The blood ure was 150/50 mm Hg The spleen was not palpable he skin was free from rashes There was no clubbing of ngers The urine contained albumin 10 mg per 100 ml , y red cells, and numerous epithelial cells, but no pus ɔr casts A blood count showed Hb 10 2 g per 100 ml), red cells 4,000,000 per c.mm , and leucocytes 13 200 mm. (polymorphs 63%, lymphocytes 31%)

od-cultures were negative on Feb 19, 22 (two), 23 (two), ı 11, April 15, 17, and 19 and May 5 and 25

gress —For $2^1/_2$ weeks there was intermittent fever up [° or 102°F daily

Feb 22 the patient was seen by Dr Paul Wood, who lespite negative blood-culture and absence of embolic mena, that the evidence for a presumptive diagnosis of ute bacterial endocarditis was strong enough to start llin therapy A few petechiæ were seen on the trunk ıb 25 and 26, and the urine contained numerous red ıth epithelial cells and some leucocytes

atment —The fever was controlled for three weeks with llin 4 mega units daily The fever then recurred and ɔrıl 11 penicillin was withdrawn to reinvestigate the cultures After this the fever remained uncontrolled with large doses of penicillin—ı e , 4 8, and 12 mega units daily, and with sulphadimidine Streptomycin 2 g daily was then given with dramatic results Treatment was continued for about four weeks until June 24, when toxic symptoms put an end to it After the start of streptomycin therapy the general condition much improved and the fever permanently subsided, although fresh petechiæ still appeared as late as June 11 The dramatic improvement in weight, hæmoglobin, and E S R following the exhibition of strepto mycin were as follows

Date	*Weight (kg)*	*E.S.R (mm in 1 hr)*	*Hb (g per 100 ml)*
May 13	49 6	—	—
May 20	—	122	9 6
May 21	50 0	—	—
May 26	Streptomycin therapy begun		
May 27	51 2	126	—
June 2	—	90	—
June 4	52 5	—	—
June 25	53 5	Streptomycin stopped	—
June 30	—	—	11 3
July 30	—	15	—
July 31	56 9	—	—
Aug 12	—	—	15 2

The patient s convalescence was uneventful except for an attack of paroxysmal auricular fibrillation on June 25 On Nov 24 she was re-examined and found fit to start light office work

DIAGNOSIS

Since chemotherapy provides fresh hope of cure for these cases, it is clear that early diagnosis is essential A few years ago there was no urgency of diagnosis, which was often delayed until the clinical picture was full-blown and blood culture positive Nowadays such an attitude is unjustifiable Blood culture is a very crude test, and in many cases the patients are gravely ill in spite of negative bacteriological findings and urgent treatment is imperative to save life For this purpose it is important to institute treatment at the earliest possible moment Subacute bacterial endocarditis should be strongly suspected in any case of protracted fever in patients with valvular disease of the heart and no other obvious infection Where there is evidence of embolic phenomena in skin, urine, or spleen, the diagnosis should be made in the absence of bacteriological proof, and treatment instituted where the severity of the illness demands it In these cases large doses of penicillin—e g , 2 mega units daily—are at first advisable Should the fever remain uncontrolled, further blood-cultures should be made in the hope of isolating the organisms and investigating their penicillin sensitivity If they are penicillin resistant the dosage will have to be increased If the fever still remains uncontrolled and the patient is severely ill, streptomycin is worthy of trial

STREPTOMYCIN TREATMENT

Success with streptomycin in this disease was first recorded in 1946, and since then about 50 cases have been successfully treated with it, though it should be remembered that many of these cases were also treated with penicillin and sulphonamides Study of the American reports shows that in about 22 cases strepto mycin was mainly responsible for cure on clinical grounds, but only 8 of them were treated with streptomycin alone (Wallach and Pomerantz 1949) The organism isolated by blood-culture in 4 of these was *Strep viridans* and in 2 cases *Hæmophilus influenzæ*

The dosage and duration of treatment in this condition cannot be assessed in the present state of knowledge , it is clear that toxicity with streptomycin is more likely with larger dosage over a long period For this reason it would seem wiser to find the smallest effective dose to control the fever as judged by a four hourly temperature chart The necessary duration of treatment is probably about three or four weeks

STREPTOMYCIN IN SUBACUTE BACTERIAL ENDOCARDITIS

REPORT OF THREE CASES

PHILIP H WILLCOX
M D Camb, M R C P
PHYSICIAN CANADIAN RED CROSS MEMORIAL HOSPITAL, TAPLOW ASSISTANT PHYSICIAN, KING EDWARD VII HOSPITAL, WINDSOR

PENICILLIN treatment has proved so successful in subacute bacterial endocarditis that a high probability of cure may be entertained in cases diagnosed early, but success, which can in no case be guaranteed, depends on early treatment, on sufficiently large and prolonged dosage, and on the penicillin sensitivity of the organism (Christie 1948, 1949)

Some cases not only fail to respond but become worse in spite of such treatment, and may yet be saved by the use of streptomycin The following three cases of rheumatic carditis, with mitral and aortic valvular disease in each case, all illustrate the success of streptomycin after the failure of penicillin in large dosage to overcome the infection Cases 1 and 2 were under my care, and case 3 was under the care of Dr E G L Bywaters (to whom grateful acknowledgment is made for the use of the notes) in the special unit for rheumatism at the Canadian Red Cross Memorial Hospital

CASE RECORDS

Case 1 (fig 1) —A man, aged 29, was admitted on May 31, 1949, with six days' history of headache, sweating, and aching pains in the arms and legs His right eye was bloodshot He had vomited once only He had had rheumatic fever in 1938, and during convalescence evidence of rheumatic carditis affecting the mitral and aortic valves had been found

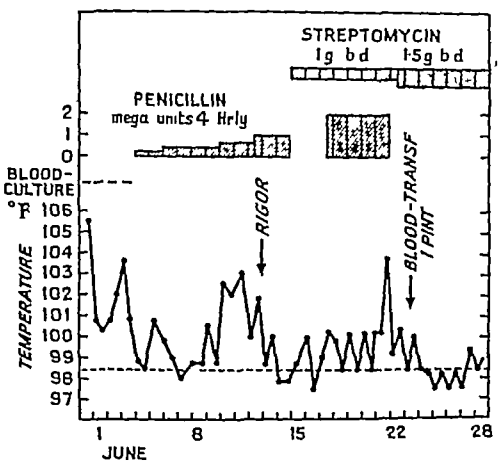

Fig 1—Temperature and treatment chart of case 1

On examination he was febrile and looked toxic and pale, there was a subconjunctival hæmorrhage in the right eyelid There were no joint swellings or rash The pulse was regular and collapsing The apex beat was in the fifth interspace 8 cm from the midline There were a rough systolic murmer at the apex and systolic and diastolic aortic murmurs, the latter conducted down the left side of the sternum. Blood pressure 120/65 mm Hg The spleen was not palpable and not tender The lungs showed no abnormal signs There was a trace of albumin in the urine, but no red cells or casts in the deposit

Progress —Six blood cultures in his first three days in hospital grew no pathogenic organisms On the fourth day the spleen was definitely easily palpable On this day (June 3) the hæmoglobin was 13 1 g per 100 ml white cells 16,600 per c mm (polymorphs 84% lymphocytes 9%, monocytes 5%, plasma cells 2%) The erythrocyte sedimentation rate (E S R) was 64 mm in one hour (Wintrobe), and packed cell volume 38 c cm per 100 ml

Treatment —Subacute bacterial endocarditis was and, owing to the man's serious condition, a penicillin 150,000 units four hourly was begun. did not control the fever, the dosage was increased to units four hourly on June 4, 500,000 units to June 9, 1,000,000 units four hourly on June 11, units four hourly on June 18

Progress —The fever remained uncontrolled On the man's spleen was two finger breadths enlarged, were presystolic and mid diastolic murmurs at the faint macular rash at the back of the chest which extent next day was thought to be due to penicillin. purplish node was seen on the dorsum of the right June 12 There was a slight rigor, and an matous rash, urticarial in places, was seen on the trunk. A small area of redness and tenderness on of the right foot was thought to be embolic. A swelling was seen on the left fourth toe Tender on the left index finger on June 16 and 21, on the tip second finger of the right hand on June 18, and right palm on June 20 A fresh embolic spot the right hand on July 2 On July 4 albumin, cells and pus cells, but no casts, were found in the urine

Streptomycin —On June 13 Dr Paul Wood advised myein in view of the unsatisfactory response to large dosage A course of intramuscular streptomycin b d was begun on June 14 This had at first little effect on the fever in spite of the concurrent tion of penicillin, but after the dose had been increased 1 5 g b d on June 21 the fever was controlled The was increased to 2 g b d on June 30, and reduced to eight-hourly on July 5, and to 0 5 g daily on July 29 Streptomycin was withdrawn on July 31 1 pint of blood was on June 22 and another on July 2 without causing reaction

Streptomycin toxicity was noticed on July 2 consisting giddiness, occipital headache, and difficulty in focusing Ataxia, especially at night, and slight giddiness have been noticeable ever since, and were still complained of on Jan 1 1950, though there had been no recurrence of fever, and patient had resumed his occupation as a carpenter and feeling fit

Case 2 (fig 2) —A young man, aged 23, had of backache and fever for seven days before admission had an irregular pyrexia between 99° and 101°F He had several known attacks of rheumatic fever at the ages 7 years, 13, and 20

On admission on Oct 14, 1949, he was pale, with tongue His pulse was collapsing but regular There evidence of gross clinical enlargement of the heart, the apex beat being in the anterior axillary line and the impulse The first sound was loud at the apex, and there were systolic and diastolic murmurs There was a rough systolic at the base and a well marked diastolic murmur down the left side of the sternum His blood pressure 140/30 mm Hg No abnormal signs were found in the Liver and spleen were not palpable The teeth and were healthy No petechiæ or other embolic phenomena were apparent Three blood cultures on Oct 15 and 16 grew organisms Subacute bacterial endocarditis was in the absence of any other cause of his pyrexia

Progress —On Oct 16 the patient began to complain of central abdominal pain, and this persisted until Oct 19 it was felt in the right renal region A few petechiæ visible on the chest and abdomen There was well

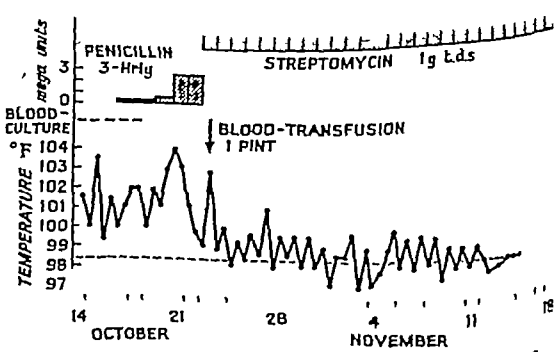

Fig 2—Temperature and treatment chart of case 2

thrombus in the veins but no signs of intimal or ase of the arteries

DISCUSSION

case illustrates the characteristic features of il gangrene secondary to venous thrombosis as by the triad of Audier and Haimovici (1938) e gangrene was due to arterial spasm seems to ly proved by the fact that the femoral artery a state of spasm when exposed at operation but vigorous pulsation after ligation and division ems to prove also that spasm is the cause of grene in these cases, and not widespread venous osis as postulated by Haimovici and Suffness

eat interest is the associated pulmonary embolism, ire noted fairly commonly in the literature n 1938, Koch 1940, McNalley 1932) The post ve emboli were associated with slight œdema of t leg, from which they probably originated 949) states that if pulmonary embolism occurs atient with phlegmasia alba dolens it can be d that the emboli have originated in the unswollen d this is borne out by the sequence of events in se

possibility of organic arterial disease can be ated on the operation findings and the dissected en Paradoxical embolism is a remote but unlikely lity Theoretically after pulmonary embolism ised pulmonary arterial pressure enhances the lity of paradoxical embolism, but the femoral l pulsation after division seems to exclude this ll embolus lodged peripherally may have caused spasm, but could not be found on dissection

would seem that cases of phlegmasia alba dolens be treated energetically on the lines laid down lsner (1947)—i e, by early paravertebral sympa block. The newer antispasmodic drugs—e g, the hylammonium compounds—may prove of value v of the definite risk of gangrene if these measures lumbar sympathectomy is indicated in cases do not respond to these measures, particularly if and Haimovici's triad is present

icoagulant therapy should be instituted early in ases because so many are associated with pulmonary ism, which in the present case preceded the gangrene ny weeks

SUMMARY AND CONCLUSIONS

ase of puerperal gangrene due to arterial spasm lary to thrombophlebitis is described This is bly now the commonest cause of puerperal gangrene and ergotism now play a minor role

egmasia alba dolens should be energetically treated, se it not only has a morbidity (i e, chronic œdema affected leg) but also a local mortality (i e, ene)

association of pulmonary embolism with this type is noted

wish to thank Mr J T Rice Edwards for permission t and publish this case, and Dr T J Thomas for the gical follow up

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New Inventions

EXCHANGE TRANSFUSION APPARATUS

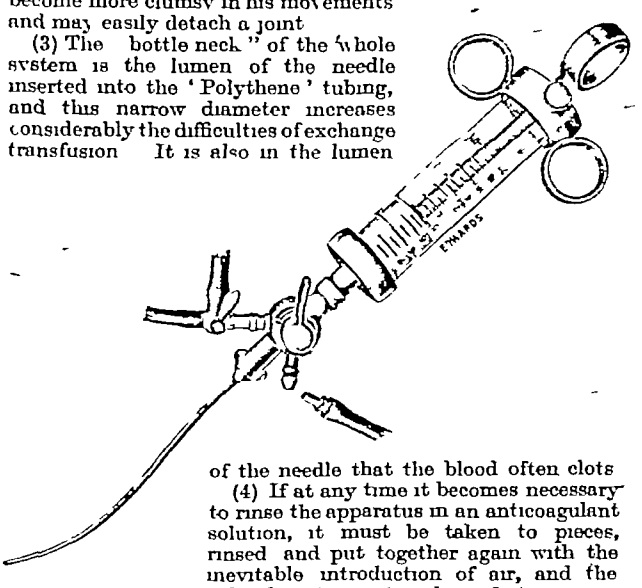
EXCHANGE transfusion in infants with erythroblastosis fœtalis is often complicated by faults or inadequacies in the apparatus The Medical Research Council[1] suggested, for exchange transfusion, apparatus consisting of a 20 ml syringe to which are attached two stopcocks with side valves, the distal one of which is connected to the infant's vein via a 19-gauge needle inserted into the lumen of a plastic catheter

Such apparatus has numerous disadvantages

(1) Manipulation of an ordinary syringe becomes very tiring to the hands after numerous injections and withdrawals

(2) Between the barrel of the syringe and the infant there are no less than three joints in line all of which merely rely on being pushed together with a 'Record' or Luer fitting At any or all of these joints air can be, and often is, sucked into the circuit Moreover, as the operator tires he tends to become more clumsy in his movements and may easily detach a joint

(3) The "bottle neck" of the whole system is the lumen of the needle inserted into the 'Polythene' tubing, and this narrow diameter increases considerably the difficulties of exchange transfusion It is also in the lumen of the needle that the blood often clots



(4) If at any time it becomes necessary to rinse the apparatus in an anticoagulant solution, it must be taken to pieces, rinsed and put together again with the inevitable introduction of air, and the risk of contamination by infection

The apparatus illustrated here has been designed in an attempt to overcome these difficulties It resembles that described by Farquhar and Lewis,[2] but with some differences It consists of a syringe of 10 or 20 ml capacity equipped with three finger rings to give one-hand control and less tiring operation The nozzle is adapted to carry a three-way tap which may be firmly screwed on to the syringe to make a rigid airtight joint The three positions of the tap are clearly indicated by a pointer

(1) Corresponding to the first position of the pointer is a female record fitting mount to which may be attached the male' record tubing connector of the standard Blood Transfusion Service giving set Blood can therefore be introduced into the syringe via the giving set from a bottle suspended by the side of the infant's cot

(2) The central position is equipped with a screwed nozzle on to which is attached a cylinder containing a rubber bush The polythene tubing is threaded through the cylinder and bush, and the tip of the tubing is then introduced into the screwed nozzle The cylinder is screwed on to the nozzle and by compression of the rubber bush the outside of the tubing is firmly gripped In this way the lumen of the tubing is not reduced and there is no smaller bore through which blood has to pass than that of the tubing itself I believe Dr L K. Diamond, of Boston, Massachusetts, was the first person to suggest that polythene tubing should be gripped in this fashion

(3) The third position is occupied by a side branch stop cock giving two routes one for the ejection of aspirated blood, the other for drawing anticoagulant solution into the syringe

1 Mollison P L, Mourant, A. E Race R R MRC Memo no 19 London 1948, p 43
2 Farquhar J W Lewis I C *Lancet* 1949 i 953

CONCLUSIONS AND SUMMARY

There is evidence that streptomycin is an effective weapon in subacute bacterial endocarditis and deserves further trial in cases due to penicillin insensitive organisms and in those in which there are troublesome reactions to penicillin

Three cases with aortic and mitral valvular disease, treated successfully with streptomycin after penicillin in liberal doses had proved ineffective, are reported here

Clinically the diagnosis was not in doubt, in spite of the failure to grow the organisms by blood culture

Grateful acknowledgment is made to Dr E G L Bywaters for the loan of the records of case 3, to Dr Paul Wood for his helpful advice in case 1, to Dr Michael Starks and Dr R F Brooks for their work and accurate records of cases 1 and 2, and to the nurses and pathology department of the Canadian Red Cross Memorial Hospital

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PUERPERAL GANGRENE

ALLAN CLAIN
M B Cape Town, F R C S
RESIDENT SURGICAL OFFICER

L L NUSSBAUM
M B Cape Town, M R C P
HOUSE PHYSICIAN

PONTYPOOL AND DISTRICT GENERAL HOSPITAL

GANGRENE associated with childbirth is a long established albeit rare clinical entity McNalley (1932) found that about 85 of 100 published cases were puerperal, 10 were post-abortal, and 5 occurred during pregnancy In further reviews of the literature Benson (1937) and Tilley (1938) attributed most cases to septic thrombosis of the pelvic vessels in puerperal sepsis, combined often with the use of ergot Benson noted that quite a number of cases affected the upper extremity and in McNalley's review 15% of cases fell into this category

Benson, however, also noted that the gangrene was sometimes of venous origin, and Audier and Haimovici (1938), in an excellent review of gangrene of venous origin, attribute wet gangrene in puerperal cases to venous occlusion, and dry gangrene to arterial occlusion They point out that the gangrene associated with thrombophlebitis may simulate arterial embolism, and they describe a triad found in these cases of venous gangrene—i e, very severe pain in the affected limb, rapidly developing cyanosis (phlegmasia cærulea dolens), and œdema

Experimentally Audier and Haimovici found it difficult to produce gangrene by venous ligation Only if the whole venous circulation is obstructed does gangrene develop DeBakey et al (1939) showed experimentally that simple ligation of a vein caused a decrease in the oscillographic excursion of the accompanying artery If a segment of vein was isolated between ligatures and injected with a sclerosant solution, the oscillographic excursion was decreased much more, but a sympathetic block or sympathectomy relieved this spasm This seems to be the cause of the type of puerperal gangrene of venous origin recently being increasingly reported (Gutman 1938, Koch 1940)

The cause of puerperal gangrene may thus be (1) arterial emobhism, (2) arterial thrombosis, (3) arterial spasm secondary to thrombophlebitis, (4) venous thrombosis alone, or (5) a combination of these

Arterial embolism is a theoretical possibility requiring a focus of origin for the embolus on the arterial side of the circulation, with pregnancy as a coincidental condition—e g, bacterial endocarditis The other possibility is that of paradoxical embolism

Arterial thrombosis is the mechanism in cases associated with puerperal sepsis Benson (1937) attributed this to arterial occlusion of the lower limb by a septic thrombus originating in the pelvic vessels, but this type of case was associated with the use of —i e, there was an element of spasm—and with decreased incidence of severe puerperal sepsis possible with chemotherapy this condition is rarely to be seen

Arterial spasm secondary to thrombophlebitis probably the cause in most cases at present If so, the appearance of Audier and Haimovici's should be the signal for energetic antispasmodic th Haimovici and Suffness (1948), in a discussion gangrene of venous origin, consider, however arterial spasm plays a minor rôle in the causation that the widespread venous thrombosis present the venous return, and there is thus a state of stasis with consequent tissue anoxia leading to g

CASE RECORD

Mrs A, aged 39, was admitted to Pontypool and General Hospital on July 25, 1949, having been by her private doctor as a case of phlegmasia alba dolens

On admission she was apparently in extremis, b cyanosed and shocked, with a blood pressure of 70/40 Pulmonary embolism was diagnosed, and resuscita measures were adopted Nikethamide was given, an venous plasma drip was set up immediately, and the patie blood was grouped and cross matched Six pints of Rh positive blood was given during the next forty-eight ho After a few hours the patient's general condition impro sufficiently to enable a proper history to be taken an thorough physical examination to be made

History—Nine weeks before admission the patient been delivered of a normal child after labour had b induced for "swelling of the ankles" The puerperium been uneventful until the third week, when she had develo pain in the right side of the chest, which had been diagno as pleurisy, and an effusion had been aspirated by her pr doctor on two occasions Two days before admission patient had had severe "cramps" in the right leg wh had immediately become dark blue and enormously swo Previously, during the fourth month of the pregnancy, patient had had in this leg a temporary swelling which been diagnosed as phlebitis She had had varicose v in both legs for twelve years with no referable symptoms had previously borne a normal child in 1939

On examination the right lower limb was enorm swollen with pitting œdema and deeply cyanosed. peripheral pulses were palpable, and the limb was c anæsthetic, and paretic There was a suggestion of a of demarcation about 2 in below the knee The c contained fluid at the right base, and a pleural frictio was heard at the left base

Treatment—At this stage the patient was heparin During the following day her general condition impro but a definite line of demarcation developed below the k and the skin began to blister, so it was decided to ampu the limb

Operation—Under thiopentone, gas, oxygen, and tri ethylene anæsthesia (Dr H Lister Wilson) the k amputated at the site of election in the thigh During operation the femoral artery was pulseless, but as soon was ligated and divided the proximal end began to pul vigorously The tissues poured out œdema fluid during operation

Postoperative Course—The patient improved grad but on the third day she developed signs of a small pulm embolus in the left lung in spite of heparinisation probably originated from the left leg, which had be swell and was crêpe bandaged On the tenth day a further small embolus These were confirmed radiolog Heparin and penicillin were administered for two postoperatively, and the temperature settled gradually further postoperative course was uneventful, and the healed by primary intention Radiography of the ch Oct 5 showed slight residual opacities and no fluid.

Pathology—Dissection of the operation specimen sh widespread venous thrombosis involving superficial (the short saphenous vein) and deep veins, but the were all quite empty of blood Gangrenous changes present in the tissues below the line of demarcation. logical examination of veins and arteries (Dr J Fine) re

THE LANCET

ONDON SATURDAY AUGUST 19, 1950

The New Princess

ncess ELIZABETH, the Heiress Presumptive, gave to a daughter at Clarence House, her London on Aug 15 The first bulletin, signed by illiam Gillatt and Mr John Peel (obstetricians) F Hall (anæsthetist), and Sir John Weir ician to the King), was issued soon after mid and read as follows

: Royal Highness the Princess Elizabeth Duchess of ourgh, was safely delivered of a Princess at 11 50 A M Her Royal Highness and her daughter are both well

urth the infant Princess weighed 6 lb

e nation, having affectionately insisted on sharing ugh before her birth, will be quick to welcome the g Princess and wish her luck in a troubled world ier Parents and Grandparents they offer their congratulations

Treatment of Myasthenia Gravis

ASTHENIA gravis cannot yet be called curable, the outlook has certainly brightened since tv years ago, when BRAMWELL[1] could not nce himself "in any case that improvement the direct consequence of the remedy" Today medicine and surgery claim to effect a large sure of palliation in a considerable proportion of s No connection has yet been established be n the clinical picture and the structural changes etimes found in the muscles (lymphorrhages) or the thymus gland (enlargement, thymoma or ular abnormalities) But the aim of all modern tments is either (centrally) to suppress the activity he thymus or (peripherally) to restore the normal tions between acetylcholine and cholinesterase he myoneural junctions The extreme variability the distribution and duration of spontaneous ssions and relapses makes it difficult to assess the e of any but the most dramatically successful tment And, as LAURENT[2] points out 'Neo-mine' dosage alone is not a satisfactory criterion progress the patient's eagerness to report im-ement, the misgivings aroused by references to "addiction," and (in cases treated surgically) operative restriction of activities or change of s, make this a thoroughly unreliable standard only objective technique providing a quantitative sure of severity and response to treatment is ymyography which is now extensively used this purpose in the United States and will no ot be increasingly adopted here

Suppression of thymus activity is attained either by X rays or by surgical excision VEITS[3] who subjected most of his surgically treated patients to irradiation before thymectomy, found that many cases were temporarily improved by the X rays and often the irradiation seemed to be as effective as the subsequent operation However he was not primarily concerned with the value of irradiation Other results suggest that patients treated by irradiation alone are unlikely to be any better after six months than they would have been without it, even the most optimistic observers do not claim improvement in more than 18%

Much better results than this have been claimed for thymectomy, but the three recent British reports are somewhat disappointing—where the data are adequate for a proper assessment the results are poor, and where the results are said to be unequivocally satisfactory the data are incomplete Furthermore the reports chiefly emphasise the improvement noted after many years, whereas if operative benefit is to be convincing it should occur reasonably soon after the operation This did happen in 2 of VEITS's 18 patients, but because less than twelve months had elapsed since operation in 7 cases he considered it too soon to judge their improvement KEYNES[4] does not mention how long after operation he assessed improvement in his series And his argument that in cases treated surgically the probability of lasting remissions would be extremely small on the basis of HARVEY's[5] figures is not wholly convincing The conclusions reached in these three surgical reports are at variance in important respects Two find that thymectomy is more likely to be beneficial if there is X-ray evidence of the presence of a thymus the third comes to the reverse conclusion One finds that the prognosis is much better in early than in established cases the others note no such correlation One contends that operation is the treatment of choice in all but a few cases, another recommends that less than 50% should be operated on One finds that patients of all ages have an equal chance of benefit another strongly advises against operation if the patient is over 40 KEYNES advises early operation on account of "the 11 6% incidence of tumours the development of which should if possible, be anticipated", but none of these reports gives any example of a tumour appearing in a patient already known to have myasthenia gravis—indeed, most of the thymomas found had been present a long time before the beginning of symptoms All in all the physician who reads these papers will probably remain unconvinced that surgery offers a better chance of improvement than medicinal treatment alone

Of medical treatment it can be said at once that ephedrine and neostigmine are still the only remedies which offer substantial relief over long periods though several other drugs have lately been introduced Ephedrine is commonly given in doses up to gr 1½ twice or three times daily Sleep may be impaired if the last dose is taken after 3–4 P.M., and in elderly patients the drug may cause difficulty in micturition Ephedrine alone is seldom very effective, but it is often useful as an adjuvant to neostigmine Neostigmine is given either by intra-

1 Bramwell, E., Index of Treatment by Various Writers 10th ed., Bristol 1931 p 691
2 Laurent L. P E Brit med J 1949 ii 814
3 Veits H R Ibid 1950 i 130
4 Keynes C Ibid 1949 ii 611
5 Harvey A M Bull N Y Acad Med 1948 24 305

The solution can be stored in a rubber capped bottle with a connection from the stopcock to a needle piercing the cap, a second needle being inserted to allow air to be drawn into the bottle Alternatively, the anticoagulant solution may be stored in a standard blood transfusion bottle and a giving set used to connect it to the apparatus

In this way an entirely closed circuit is obtained, and any part of the apparatus can be flushed with anticoagulant solution without dismantling a single joint, and, after flushing, the solution can be ejected through the tube used for discarding the blood aspirated from the baby

A small stand carries the syringe rigidly in and is mounted with a screwed clamp to the any convenient table When in position, the lies at an angle of 45° to the horizontal, thus that any air in the system ascends to the p syringe and is not introduced into the infant's

The apparatus is manufactured by Messrs F Supplies Ltd, 83, Mortimer Street, London, W1 to thank Mr J T Burns of that firm for his in its production

JOHN HENDERSON, M.B.

Canadian Red Cross Memorial Hospital

Reviews of Books

Disorders of the Blood

6th ed Sir LIONEL WHITBY, C V O, M C, M D, F.R C.P, D P H, regius professor of physic, University of Cambridge, C J C BRITTON, M.D, D.P H, physician and hæmatologist, Prince of Wales's Hospital, London. London J & A Churchill 1950 Pp 759 42s

THE writers of a textbook on a subject that is rapidly growing have to steer a course between the Scylla of omitting new and relevant material, and the Charybdis of including new work that is denied or altered before the book gets into print In this sixth edition, the authors have aimed at giving "a fair appraisement of the subject up to the end of 1949," and it will be agreed that they have made a very good selection of new material The general shape of the book remains unchanged There are 85 more pages, but much has been deleted Four new plates, mostly of not very clear colour photomicrographs, are added, fortunately the former colour plates, which are better, are also retained Nomenclature follows accepted English usage and has been standardised throughout the book, and the authors have sane views on the megaloblast question Revision of detail has been remarkably complete for example the standard hæmoglobin is now given as 14 8 g per 100 ml, the use of intravenous iron is described, vitamin B_{12} has its place, the section on myeloma has been adequately revised, and in splenic anæmia there is a good and balanced discussion of the problem of selecting the best treatment

A really good short account of the complicated subject of blood-groups does not burke the question of the subgroups, either in the ABO or the Rh groups A timely section on assessing the hazards of radiation workers is now included

A few criticisms can be made It seems odd to give $4^1/_2$ pages to a discussion of the outmoded Arneth and similar counts, while alloting only 3 to a rather confusing account of blood-clotting The description of some techniques could do with polishing for instance, in red-cell counting, most laboratories now use the improved Neubauer ruling, and this should at least be shown, again, a method like the use of viper venom for estimating prothrombin-time—which is admitted to be unreliable—should be deleted from a standard textbook These however, are minor points, and this edition maintains the reputation of the most readable textbook on the subject

Eighty Thousand Adolescents

BRYAN H REED, B.D London Allen & Unwin 1950 Pp 188 12s 6d

THE Edward Cadbury Charitable Trust, which inaugurated this survey, has provided in its results much food for thought—more, perhaps, than in any comparable recent study The book itself should be read, for the scope and diversity of the data obtained by visits to youth organisations and by individual questionary-filling makes them proof against adequate summary Statistics cover most aspects of youth work, and many aspects of social behaviour, such as cinema going, reading, gambling, interests, and leisure The standards of literacy and cultural interests are low by orthodox educational standards—though, judging by examination answers, a survey of literacy in preclinical students of medicine might give equally disconcerting results In general, the extent to which adolescents succeed in emancipating themselves from their environ through spontaneous associations, such as jive and pigeon clubs, no less than through organised organisations—is encouraging The really imp problem is not one of literacy, interest, or the survey serves to underline at every point the that the real need of all the youngsters, unattached to youth clubs, is for experience of in an integrated social society The authors, in discussion of leadership and training for citizenship fully aware that the adolescent problem belongs to anthropology rather than morals, and that it is cosmic reflection of the asocial adult society To extent they are ready to criticise, fairly but point the uniformed and disciplinary type of youth which, from the anthropological point of view, very closely the response of power-centred adult to the insecurity of an asocial background there case, as they realise, for seeing in the "jive club" exhibits mutual aid a more valuable manifestation the highly organised youth movement which depe for cohesion upon discipline from above

The religious background of the survey is now obtrusive, and is critically and informatively tre throughout The authors contrive to be fair to every Their awareness of the general sociological problem its relation to questions of politics, economics, society structure is most praiseworthy In view of closure of the Peckham experiment which aimed a integral family study of sociality, and which is sensibly criticised here, we might reasonably wish an extension of that awareness in official public healt

Office Orthopædics

LEWIS COZEN, M D, F.A.C S, assistant profess orthopædic surgery, College of Medical Evangelist Angeles London Henry Kimpton 1950 Pp 23

Dr Cozen hints in his preface that his book is n intended to guide the general practitioner in details of daily management of ambulatory ortho patients which are often glossed over in larger textb and it is certainly true that much useful inform is to be found here on splints and strapping, plast paris, local anæsthesia, and clinical examination it is all catalogued in a rather uncritical and unsel manner, and the final section on differential dia includes a few words on so many obscure condi dragged in for the sake of completeness, that it rather dreary reading Some judicious pruning of t would make a second edition more acceptable

Textbook of Biochemistry (5th ed Philadelph London W B Saunders 1950 Pp 609 30s)—Bynot trends in his specialty, and shifting the emphasis accor Prof Benjamin Harrow has been able to keep his book t the same convenient size yet thanks to dextrous sub a formidable list of additions have made their way i text Among these are a new chapter on biological and many references to microbiological methods

The Irish Medical Directory and Hospital Year 1950 (Dublin Parkside Press Pp 268 15s 6d) contains interesting forewords written by Dr Noel C B T D, minister for health Republic of Ireland, and the Dehra Parker D B E M.P, minister for health an government of Northern Ireland Additional items the Dublin Hospitals Bureau the Local Health Ant of Northern Ireland, the Hospitals Management C of Northern Ireland, and the National Blood Tran Association

nine may make matters worse by causing pouring of saliva and pharyngeal mucus, ly if enough atropine is not given at the same Often, however, the practitioner is more ied with the management of the patient then disease Many cases of myasthenia gravis—e described in our Disabilities series[13] was mple—are not diagnosed until the patient has many months of mental anguish with the of hysteria Then when the misconception rcome, the contemptuously critical attitude it engendered often changes to an over-ous commiseration which is even more dis-ging A balance must be struck between ndency, or the prospect of indefinitely protracted ient, and the over-optimism which invites ent disappointment Complete remissions are s possible even after long periods of severe lity, and the patient's interest should be ed in exploring variations in the amount and g of doses The better-educated patient ionly keeps himself fully informed about new lies and will ask to try those that seem appro-, this very natural and not necessarily neurotic on should not be lightheartedly discouraged

Bather's Cramp

"a Frenchman bathes after a meal and drowns," NDRÉ MAUROIS once said, "he is smitten with stion, the Englishman may drown in just the way, but his friends call it cramp and so the nal honour is saved" It will be news to most that bather's cramp is an exclusively English ter But at this time of the year middle aged on our many beaches do gaze anxiously at their ies to assess the passage of postprandial time, countless small children are restrained by their ers from bathing too soon after meals, lest the of cramp overtake them Yet sudden death ie water will inevitably mar some holiday and itless it will be attributed, by the lay public if y the pathologist, to bather's cramp The mere that the victim died while sea-bathing seems to taken as excluding such other accidents as llexy, coronary-artery occlusion, and the other non causes of sudden death

iere are undoubtedly some cases where no clear e can be found at necropsy, and the pattern is rally the same A healthy person, perhaps an nplished swimmer, enters the water, appears to njoying his bathe, and suddenly and silently ipears Often he is dead before being recovered scuers, but if he survives he generally remembers about it Occasionally consciousness may be mmediately on entering the water It is difficult e how muscular cramp alone could disable him iddenly, without warning Even if bereft of t in both legs an experienced swimmer can keep by using his arms alone, crying for help the And are swimmers any more liable to muscular p than other athletes? The cutaneous vaso riction induced by exposure to cold ought, etically, to ensure an improved muscular blood-y, it would indeed be ironical if the bather, wing in brine, should die of the cramp attributed onde deficiency Clearly some other explanation must be sought As an alternative to cramp, several other conditions have been postulated, including vagal inhibition, hypertensive encephalopathy, or the paralysing pain of an acute disc prolapse, presumably induced by the occasional bather's unpractised version of the Australian crawl Acute dilatation of the stomach, perhaps precipitated by swallowing sea-water when the stomach is already full, is a further suggestion. In recent correspondence columns the sad demise of a favourite puppy has been tentatively attributed to a sudden attack of Charcot s laryngeal vertigo, brought on by falling into the water

BOIGEY[1] has lately surveyed the physiological changes induced by cold bathing and attempted to explain these sudden deaths The healthy young adult on entering cold water experiences a sudden stimulation accompanied by blanching of the skin and a sense of constriction in the chest This soon gives way to a feeling of well-being which should normally persist long after the bathe is over If immersion is unduly prolonged, peripheral vaso constriction may be succeeded by vasodilatation, and syncope may ensue In some less fortunate people with unstable vasomotor control, the plunge into cold water leads to immediate headache, general muscle tightness, violent shivering, and a sickly pale cyanotic complexion In BOIGEY's view, children are more subject to this reaction than adults but those parents who are reduced to shivering wrecks when sharing their children's marine exploits will not agree He supports the traditional English approval of cold bathing for young adults, but enjoins people over fifty to be cautious, because of the reactive hypertension induced by peripheral vasoconstriction He has himself seen no less than 11 cases of hemiplegia beginning within an hour of cold bathing

The part played by heavy meals shortly before bathing deserves critical examination On general principles, strenuous exercise of any sort should be avoided till digestion is reasonably well advanced Many of the holiday maker's transient digestive upsets—"gastritis," diarrhœa, and vague dyspepsia—are undoubtedly due to neglect of this simple precaution VERHOOGEN[2] advanced the ingenious explanation that some sudden postprandial deaths are due to anaphylaxis sudden exposure to cold results in release into the general circulation of imperfectly digested protein derivatives, the delay in reaction being explained by the relatively slow passage of these substances through the gut wall In other instances, he suggests, the anaphylactic reaction may be due to cold itself, and susceptible people might be detected by applying ice or ethyl chloride to the forearm and watching their reactions This project may appeal to the ardent physiologist, but will gain little support from the rank and file, who go to the sea to enjoy themselves The precaution of refraining from bathing immediately after a heavy meal is almost certainly wise, but that apart doctors can offer little useful advice to healthy subjects A few will inevitably die as a result of strokes, cardiac catastrophes, vagal inhibition, cold anaphylaxis, or—just possibly—bather s cramp, but they will presumably die happy And that is no mean achievement, these days

13 Disabilities, *Lancet* 1949 I, 197

1 Boigey M *Pr méd* 1950 58 854
2 Verhoogen R. *Brux. méd* 1933 13 1165

muscular injection of 1–2 5 mg in solution or by mouth in 15–20 mg pellets The dosage required varies widely Some patients are kept comfortable and fit for full work on 60–100 mg by mouth daily, others need much more and must also have intramuscular injections Patients have been known to take over 1000 mg by mouth and 7 5 mg by injection every day without developing toxic effects But as a rule these side effects—intestinal colic, diarrhœa, anorexia sweating, and salivation are the chief ones—necessitate a dose of atropine (gr $^1/_{100}$ by injection or 20–30 minims of tincture of belladonna by mouth) before each dose of neostigmine, and sometimes they are still so severe that the patient cannot take the full amount of neostigmine that he needs

The other remedies fall into two groups (1) those of historic interest but of little value in regular treatment, and (2) those introduced so recently that their full effects have not yet been fully determined The first group includes glycine, suggested by BOOTHBY [6] in 1932 because it diminished creatine excretion, but this is now rarely used, and guanidine hydrochloride, introduced by DODD and his colleagues [7] in 1938, and not now recommended, though it has slightly improved a few cases Potassium lies on the borderline LAURENT and WALTHER [8] reported favourably on the effects of 10–50 g daily in divided doses, the few patients who can tolerate effective doses for long may find it useful in conjunction with neostigmine and ephedrine Among the newer remedies of the second group there are three with strong cholinesterase inhibiting properties in animals Di-isopropylfluorophonate (D F.P) [9] is not so effective as neostigmine, though it reduces the cholinesterase content of the plasma to zero promptly and for a long time It is given in doses of 2–3 mg intramuscularly once or twice a week Toxic side effects, similar to those of neostigmine, often prohibit its use, but its one advantage is that it improves power for conspicuously longer than neostigmine Apparently neostigmine protects cholinesterase from deactivation by D F.P, so when both drugs are being given at least $1^1/_2$ hours should elapse between doses of D F P and of neostigmine Hexa ethyltetraphosphate [10] has similar effects when 10–12 mg is injected intramuscularly every three to five days, and has been used as an alternative for lowering the dose of neostigmine required Two years ago, BURGEN and others [11] at the Middlesex Hospital introduced the third anticholinesterase drug—tetra ethylpyrophosphate (T E P P), which is intermediate in duration of action between neostigmine and D F P Their report, and that of STONE and RIDER, showed that 8–12 mg of T E P P a day by mouth will completely relieve the symptoms in some cases and substantially reduce the requirement of neostigmine in others But its use presents some difficulties The drug is rapidly inactivated by water, so a stock solution in anhydrous propylene glycol has to be diluted with water or milk immediately before being swallowed A more serious is the narrow margin between the effective peutic dose and one that gives rise to toxic including convulsive seizures and severe cardia, accompanied by depression of ST and low-voltage T waves in the electrocardi Moreover, a dose that is well tolerated for a time later become toxic As with D F.P, the esterase inhibiting effect of T E P P is blocked neostigmine, so neostigmine must not be given $1^1/_2$ hours of a dose of T E P P Lastly, we come the pituitary adrenocorticotropic hormone (A Starting from the observations that this increases acetylcholine synthesis in vivo, that extracts inhibit acetylcholine synthesis, that seems to cause a reduction in lymphatic tissues shrinkage of the thymus, and that removal of pituitary gland in rats produces my changes in the electromyogram, TORDA and WOLF gave 400 mg of A C T H in five days to 5 patients myasthenia gravis, also continuing their usual of neostigmine While taking the hormone all patients were worse and had various degrees increased fatigue, menstrual bleeding, diarrhœa colic, and hotness of the feet and hands But two days after the end of the course all were much improved, and they remained so for the three months of further observation, there was also an increase in acetylcholine synthesis and their electromyograms became more or less normal Subsequent experience has confirmed this clinical improvement, though in one patient the intensification of symptoms persisted To sum up for the two groups of drugs, only neostigmine and ephedrine have passed the experimental stage and can be relied on to relieve the myasthenic symptoms with reasonable safety, there is no evidence that they have any effect favourable or adverse, on the underlying disease

For the present, though he may consider advisable surgery for a younger patient, the practitioner probably rely on these basic symptomatic remedies in most cases of myasthenia gravis The following generalisations may be useful Ptosis and diplopia often respond extremely well in the early stages of treatment If diplopia persists, it may be wise instead of relieving it with very high dosage of neostigmine, to get the patient to wear a frosted glass in front of one eye from time to time Dysphagia also usually responds satisfactorily if the doses are timed to anticipate meals and if these are suitable in type and size In severe cases or during some relapses a nasal tube may be left in situ A of respiratory distress should never be ignored because the patient's colour remains good and pulse and respiration are not very quick, the patient's own sense of effort and distress is often a more warning of impending trouble A sudden exacerbation of weakness in the limbs may prevent the patient administering his dose of neostigmine, even if he has it ready in a syringe, he should therefore warn his friends and associates of this possibility and tell them what to do for it Acute exacerbation of respiratory weakness may call for artificial respiration in a Drinker apparatus at very short a sudden panic-stricken increase in the dose

6 Boothby W M. *Proc Mayo Clin* 1932 7 557
7 Dodd K Riven S S Minot A S *Amer J med Sci* 1941 202 192
8 Laurent L P E Walther W W *Lancet* 1935 1 1434
9 Comroe J H et al *Amer J med Sci* 1946 212 641 Harvey, A M et al *Fed Proc.* 1946, 5 182 Gaddum J H Wilson A *Nature Lond* 1947 159, 680
10 Westerberg M R Luros J T *Univ Hosp Bull Ann Arbor* 1948 14 15
11 Burgen A S V Keele C A, McAlpine D *Lancet* 1948 1 519
12 Torda C Wolff H *J clin Invest* 1949 28, 1[illegible]

ariations which exist in the services supplied by nt local health authorities" General criteria of vould help to check abuse "It is clear," says the , "that the Ministry of Health are paying public y to some local health authorities for ambulance es in circumstances where other local authorities nat they should not be provided and where they do provide them" The Ministry should cooperate in ig out this unevenness, after consultation it should late rules for the use of ambulances At present, of the more striking differences is in the authority ired before the service may be used The committee favourably impressed by the practice, followed in parts, whereby drivers are forbidden to carry one (except in an emergency) without a medical ificate, and it also applauds the London County ncil's general rule that hospitals rather than doctors ild order ambulances in London this has prevented ents being carried to hospitals where no bed is to be

The committee recommends that before admitting atient from a distant place hospitals should demand rtificate that the necessary treatment cannot reason y be obtained at a nearer hospital, and that for long rneys the railways might more often be used It ms that outpatients sometimes continue to be carried and from hospitals after they have become fit to ivel by ordinary means The report urges all large spitals to appoint a transport officer, who will be rectly responsible to the senior administrative officer nally, it proposes a tightening up in the regulations r the use of the voluntary Hospital Car Service

ANTIMALARIAL DRUGS

It is not surprising that W H O 's expert committee n malaria[1] finds that no existing antimalarial drug as all the desired qualities Their ideal drug would be causal prophylactic against all species of human ialaria parasites, would have a definite curative value nd low toxicity, and would be cheap If such a product as not yet been produced, one must remember that ifferent geographical strains of malaria parasites iffer in their reactions to both prophylaxis and therapy, and that the degree of premunition of the host may ffect their action. The efficacy of specific drugs is by io means the same everywhere

As the committee say, the treatment of malaria is irmly connected in the public mind with the use of quinine, and for malarial emergencies injections of quinine are still generally recommended The evidence hey adduce in favour of their opinion that certain vnthetic drugs may possibly be equally effective for his purpose is not perhaps entirely satisfactory, and he same is true of the observations they quote on restriction of the field of vision attributed to a toxic ction of quinine These observations were made by oatney et al.[2] in a United States penitentiary where white male volunteer prisoners took 0·5 g quinine ulphate daily, and 5 others 0·25 g, for twenty five onsecutive days Later 3 were found to have con tricted visual fields, but, as their eyes were not examined efore treatment, their vision may possibly have been bnormal previously Quinine amblyopia as such is enerally considered exceedingly rare and this isolated merican observation conflicts with experience in West frica and other parts of the tropics where Europeans are been in the habit of taking large doses of quinine er many years without untoward effect In linking uinine with the causation of blackwater fever the ommittee have of course, ample precedent But it ould be wrong to assume that blackwater has dis appeared from West Africa since the almost universal application of mepacrine (atebrin), first as a causal prophylactic and later as a remedy for subtertian malaria There seems, in fact, to be no evidence that the incidence of blackwater after quinine is greater than that after mepacrine therapy

On mepacrine in general perhaps it would be true to say that the committee tend to say more about its virtues than its vices Thus they do not comment on the risk of mental disturbances arising from the increasingly high doses that have become customary since the war, or on the lichenoid eruptions of the skin it sometimes produces Their conclusions about chloroquine and closely related compounds are necessarily rather vague, because relatively few systematic observations have been made on treatment with this drug, but they allow themselves to state that as a suppressant its action is unsurpassed by any other This is especially true in *Plasmodium vivax* infection, which can be completely suppressed by giving 0·5 g of chloroquine once a week for six months Chloroquine does not stain the skin or eyes and seems to have no undesirable side effects, but it has a smaller margin of safety than proguanil ('Paludrine') and is relatively expensive On proguanil there now seems to be some real unanimity Its main merit is that it is a causal prophylactic against *P falciparum*—a property not possessed by quinine, mepacrine, or the 4 aminoquinolines Its therapeutic action differs in different parts of the world and in different races but all agree that it is slower in action than quinine, mepacrine, or chloroquine and therefore cannot be relied on in the treatment of malarial emergencies where speed is essential Moreover, when given alone, it cannot be relied on to cure infection by certain strains of *P falciparum* Another disadvantage of proguanil is the ease with which malaria parasites become resistant Apparently this resistance is increasing especially in West Africa Of the various remedies considered pamaquin and the related 8 aminoquinolines are the most toxic and hence have little practical application Pamaquin appears to be the most poisonous, but is closely followed by pentaquine and isopentaquine

The committee's very thorough report also covers the organisation of training, and antimalarial measures in general, on all of which valuable advice is offered

TUBERCLE BACILLI IN THE C S F

The finding of tubercle bacilli in the cerebrospinal fluid does not necessarily mean that there is a diffuse tuberculous meningitis McGregor and Green[1] in 1937 cultured tubercle bacilli from the C S F of patients with primary tuberculosis in whom there was no clinical or pathological evidence of meningitis They also demonstrated by animal inoculation the presence of tubercle bacilli in the C S F of three patients with positive tuberculin skin tests and the clinical picture of meningeal irritation, without evidence of tuberculosis elsewhere Lincoln[2] in 1947 drew attention to the occurrence of "serous tuberculous meningitis" during the course of a primary infection Tubercle bacilli were not found in the C S F in her cases The fluid was under increased pressure and its cell-count was raised, but it was otherwise normal. In two patients who died after recovery from the meningitis post mortem examination showed healed non specific meningitis The view that caseous tuberculous meningitis arises by rupture of cortical foci into the subarachnoid space was put forward in 1933 by Rich and McCordock[3] Lincoln suggested that the clinical picture in "serous tuberculous meningitis" was due to perifocal reactions around unruptured tuberculous lesions in the brain -

Report on the third meeting of the committee World Health Organisation, Geneva. Technical Report Series no 8 May 1950 Pp 43 2s 3d

Coatney, G. L., Cooper W C Puhr D S Amer J Hyg 1948 47 112

1 McGregor A. R Green. S A. J Path Bact 1937 45 613
2 Lincoln, E M. Amer Rec Tuberc. 1947 56 95
3 Rich, A. R., McCordock, H A. Bull Johns Hopk Hosp 1933 52 5

Annotations

HOSPITAL APPOINTMENTS

Up till now in non teaching hospitals the appointment of registrars has been the responsibility of the hospital management committee But the posts of registrar and senior registrar are important steps in the training of consultants, and experience has shown that the universities, the medical schools, and postgraduate institutions could with advantage be drawn more closely into the task of selecting the right men for these jobs A change in the present procedure would also, as we suggested last year,[1] foster a healthy interchange between teaching and non teaching hospitals and allow the consultant in training to move more freely between the hospitals in a region On all these heads the transfer of responsibility for these appointments to the regional hospital boards[2] on Sept 1 will therefore be welcome The hospital management committees will, of course, still play an important part in selection and will continue to appoint the junior registrars No change will be made in the arrangements for the payment of the registrars' salaries in the present financial year

These registrar posts will not come within the scope of the committees that advise the regional hospital boards on the appointment of consultants, and the Ministry is laying down no precise machinery for making registrar appointments It is suggested, however, that the selection might appropriately be made by a committee consisting of a standing nucleus of one medical and one lay member appointed by the regional hospital board, one lay member appointed by the board of governors, and two medical members appointed by the university To these, two or three members would be added by the hospital concerned, one of whom would normally be the registrar's future chief A member of the specialty concerned would also be appointed by the regional hospital board or by the university

Some smaller changes have been made in the procedure for the appointment of fully fledged consultants,[3] but these mostly concern the powers and composition of the advisory committees which submit recommendations to the boards Some of these appointments—such as of members of professorial units who receive no remuneration from hospital boards, some clinical teachers, some research workers, retiring consultants continuing work in an honorary capacity, and distinguished visitors from overseas—will no longer be considered by these advisory committees, though the actual appointment will still be made by the boards The duration of the appointment need no longer be stated in an advertisement for one of these senior posts When there is no applicant of consultant standing the advisory committee may no longer recommend that one of the candidates should be appointed with the grade of senior hospital medical officer The constitution of these committees has also been slightly varied—for a teaching hospital the committee will now have 8 members Members from outside the region who represent the specialty concerned will be appointed after consultation with one of the Royal Colleges

The procedure for the appointment of consultants was designed with the laudable intention of preventing inbreeding At the time we foresaw[4] that it might bring new difficulties to replace those it avoided, and at least one London teaching hospital has found that a mechanism which looks fair and easy on paper is in practice clumsy and expensive in time labour, and money The new constitution will do nothing to ease this administrative burden

1 *Lancet* 1949 ii 949
2 S I 1950 no 1260
3 S I 1950, no 1259
4 *Lancet* 1948 ii 101

THIOSEMICARBAZONE IN LEPROSY

The German drug 'Thiosemicarbazone' or p-aminobenzaldehyde thiosemicarbazone, is now extensively tested in the United States and the as a treatment for tuberculosis, in which it seems about as active as *p* aminosalicylic acid (P.A.S.) P A S, too, it is being used both alone and as an to streptomycin Since other drugs that inhibit growth of *Myco tuberculosis* have proved effective the closely similar acid fast organism, *Myco* Dr Gordon Ryrie, of the British Empire Leprosy Association, has undertaken a clinical trial of carbazone in leprosy Of the 10 cases so far 8 were examples of the virulent lepromatous type two had chronic tuberculoid leprosy The preliminary results, reported on p 286, seem promising but as Dr Ryrie freely admits, the value of the drug be assessed after only four months' study on 10 patients All have improved clinically and most have shown bacteriological improvement In Dr Ryrie's cases they have improved more rapidly than they would have done with sulphones, and there has been less mental depression The dose of thiosemicarbazone, given mouth in 25 mg tablets of Messrs Boots's preparation 'Thiacetazone,' was gradually increased to 150 mg daily At this dose level no toxic effects were recorded but the German workers have found the drug potentially toxic and have reported anorexia, malaise, headache vomiting, anæmia, conjunctivitis, jaundice, and granulocytopenia in tuberculous patients given the drug for a long period The leprosy patients may have escaped side effects because they were not treated long enough and did not have a second course of the drug—for drug reactions occur only when there has been a previous course to produce sensitisation Toxic effects would be particularly likely to arise in poorly nourished, anæmic and infested lepers, and they may well be troublesome when a larger group of patients is treated

AMBULANCES

The free ambulance service provided under the National Health Service Acts is operated in England and Wales by local health authorities, which recover half of the cost from the Ministry of Health In Scotland, on the other hand, the service is operated entirely by the Department of Health, and the whole cost borne centrally, the Select Committee on Estimates in reviewing these services,[2] points out that none of the cost falls on the Scottish ratepayers, and in effect "the ambulance service in Scotland is mainly paid for by the taxpayers of England and Wales"

For the present financial year the total cost of the ambulance services to the nation is estimated at £7,986,000 The cost is rising as the demand increases in England and Wales the number of patients carried in ambulances and sitting case cars rose during 1949 from 365,859 in January to 488,899 in December The Select Committee finds that a large local health authority needs to maintain one ambulance or sitting-case car for about 10,000 people, but in a small and sparsely populated area the proportion may be much higher thus in December, 1949, Huntingdonshire required one ambulance or car for every 3765 of its population In England and Wales as a whole about 10% of the population are transported in this way each year, but here again local differences are wide There are also wide differences in running costs among three authorities which submitted evidence on this point, the cost per mile run ranged from 2s to 3s The committee, while advocating more centralised control, suggests that the Ministry of Health should interest itself more in the

1 See leading article *Lancet* 1950 i 264
2 Third Report from the Select Committee on Estimates 1950 Ambulance Services H M Stationery Office Pp 4s

INTERNATIONAL CONGRESS OF PÆDIATRICS

Sixth International Congress of Pædiatrics, Zürich from July 24 to 28, was attended by over epresentatives from 56 countries The largest vas from the United States, but the highest pro from a country outside Switzerland came from l, over half of whose pædiatricians attended rangements were carried out with characteristic efficiency, and there were numbers of voluntary l, including many students, to show the members answer questions, and generally ensure that hing went smoothly

the opening session, the Kongresshaus was ated with the flags of the nations taking part, delegates were welcomed by Prof G FANCONI h), president of the congress He spoke first in h, then in English, German, Italian, and Spanish, aid that the importance of international cooperation especially realised in Switzerland, a small country anded by great neighbours and having four ent languages of her own He was glad to see that any German speaking doctors had come, and he d that the congress might be a means of helping ian pædiatrics, which, like other branches of medicine science, had suffered such a setback under the régime He regretted that the Russian delegates not, after all, been able to come

eeches of welcome were also made by Dr PH ETTER, al councillor, and Dr MARTIN BODMER, vice dent of the International Committee of the Red s There followed a pleasant ceremony when rary doctorates were conferred by the dean of the ch Faculty of Medicine on Dr Arvid Wallgren, essor of pædiatrics at the Karolinska Institut, kholm, and on Dr James L Gamble, professor in the vard University Medical School Dr Gamble, rtunately, was prevented by illness from receiving legree in person

r HENRY F HELMHOLZ (Washington) put forward an for an *international pædiatric organisation*, and at eeting of national representatives later in the week proposals were adopted, with slight modifications, the International Pediatric Association was formed objects will be to promote closer relations between iatricians of all countries by holding an international gress every three years, to promote the spread of iatric knowledge, and to cooperate with other ieies concerned with the improvement of child care, iatric education, and research in all parts of the world ther papers at the opening meeting were read by r ROBERT DEBRÉ (Paris) on *streptomycin* and by t. F GOMEZ (Mexico), who described the successful *ment of malnutrition* with a diet of purely vegetable in

SOCIAL PÆDIATRICS

t the second plenary session, held at the end of the t, Prof ALAN MONCRIEFF (London) emphasised the ortance of morbidity as well as of mortality figures reventive medicine, and quoted those of Smellie the Children's Hospital, Birmingham Respiratory infections are now the most frequent in infancy, burns and accidents the commonest cause of death lder children so preventive measures should be ted especially against these groups Turning to psychological side of social pædiatrics, Professor crieff mentioned the categories of *Children in ble*—orphans those from broken homes, neglected, moral danger He emphasised that each group numerically very large, and told delegates what being done in this country under the Children's and by various voluntary agencies to help these ren

Later in the session, Dr MARTHA ELIOT, deputy director general, World Health Organisation, gave an account of the many ways in which W H O is helping pædiatrics and child health Prof ERICH ROMINGER (Kiel) spoke on *infant dystrophy*, and Prof GINO FRONTALI (Rome) on the *endothelial constitution*, describing observa tions on the cutaneous capillaries in purpuras, scarlet fever, nephritis, and rheumatism

Sectional Proceedings

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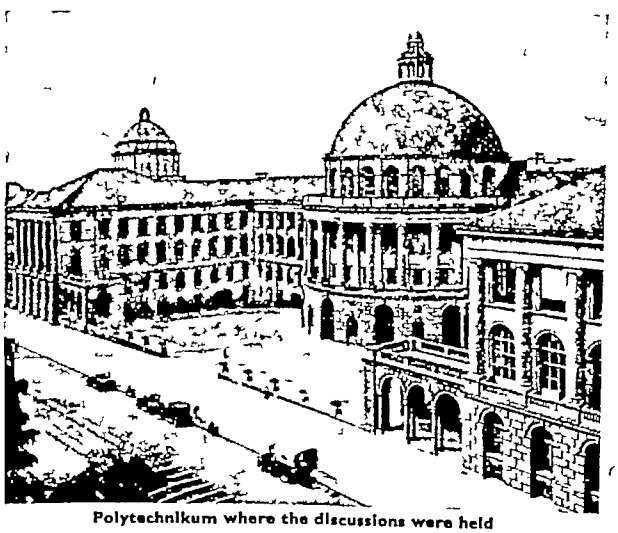

Polytechnikum where the discussions were held

More recently Choremis and his colleagues[4 5] in Athens have reported similar observations Tubercle bacilli were cultured from the C S F of patients with acute tuberculous adenitis or miliary tuberculosis even in the absence of signs of meningeal irritation They also found tubercle bacilli in the C S F of children recovering from tuberculous meningitis who had received intrathecal streptomycin and were regarded as clinically cured This differs from the report of Smith, Vollum, and Cairns[6] who did not detect tubercle bacilli in the C S F by culture after the 29th day of treatment in those patients who survived Choremis and his colleagues look upon tuberculous meningitis as having three phases —the subclinical, in which tubercle bacilli are present in the C S F without evidence of meningitis, the stage of clinical meningitis, and the phase of recovery following streptomycin therapy in which bacilli are still present in the fluid but there is no clinical evidence of meningitis They consider that the full development of tuberculous meningitis requires not only the specific histological changes in the meninges but also "secondary perifocal inflammatory reactions"

It seems that the many factors concerned in the pathogenesis of tuberculous meningitis are still imperfectly understood Both Lincoln and Choremis postulated focal hypersensitivity reactions around the caseous lesions in the brain or meninges to explain the phenomena they had observed It is interesting in this connection to recall that Choremis,[7] who claimed good results with smaller doses of streptomycin than had previously been reported, combined the antibiotic attack with tuberculin therapy The extraordinarily interesting results now obtained by Dr Smith and Dr Vollum with tuberculin are described in our present issue

CHANGES IN THE POISONS LAW

When drugs are issued in ampoules it is customary for the makers to include a little more than the usual dose —e g, 1 1 ml in a 1 ml ampoule—to allow for wastage in withdrawal This practice is now to be regularised by an amendment to rules 7 and 12 of the Poisons Rules, 1949, by which a signed order or prescription for a medicine packed in ampoules may state either the total amount to be supplied or the total amount intended to be administered The Poisons List Order, 1950, and the Poisons Rules, 1950,[8] which will come into force on Sept 1, also make the following additions to part I of the Poisons List and the first schedule

Alphaprodine *
The anti histamine drugs antazoline diphenhydramine, 3-di n butylaminomethyl 4 5 6 trihydroxyphthalide, phenindamine, and tetra substituted N derivatives of ethylene diamine or propylenediamine
Betaprodine *
Di isopropyl fluorophosphonate
Hydroxypethidine *
Isoamidone *
Ketobemidone *
Methadol *
Methadyl acetate *
Polymethylenebistrimethylammonium salts
Phenadoxone *

Preparations of anti histamine substances intended for external application are exempted from the poisons requirements Except in these preparations, the anti histamine substances,* and polymethylenebistrimethyl ammonium salts, are added to the fourth schedule, and so may only be sold on prescription Medicines containing di isopropyl fluorophosphonate that are made ready for the internal or external treatment of ailments must be labelled "Caution This preparation should be administered only under medical supervision The vapour is dangerous"

RHEUMATOLOGY AT THE ROYAL FREE

LONG waiting lists for beds in hospital tell rheumatic patients no less than the rest of the The report of the Royal Free Hospital's rheumatology unit for 1949 notes that some women with rheumatoid arthritis deteriorate so much while for admission that by the time a bed can be them their condition is almost hopeless On the other hand, cases which look similar may show so recovery during the waiting period that by the time bed falls to them they no longer need it Women this unit, have to wait longer than men, for five times as many of them attend the outpatient ment, there are only half as many beds for them as men The average waiting time for a woman is months, but some have had to wait, the report says for more than a year What is needed is evidently some means of telling at an early stage which cases are going to improve anyway, and which need intensive treatment to prevent deterioration

During 1949, 594 new and 9097 old patients attended outpatient sessions, and 204 cases were admitted to the wards—almost the same number as in 1948 Comparison of the two years shows that the number of cases of rheumatoid arthritis admitted fell off slightly in 1949, and the results were slightly poorer than in 1948 But the good results obtained with ankylosing spondylitis in 1948 were maintained and exceeded in 1949 Of the 18 cases admitted in 1949 no fewer than 13 returned to work, and the other 5 improved These results, we are told, were not easily obtained, being achieved in many cases, only after the patient had been in hospital for a long time, by the combined work of the unit and the radiology department Results in osteo arthritis were much the same in each of the two years, about a third of the returning to work, while the remaining two thirds improvement Many beds were blocked by cases needing nursing care but not benefiting from hospital treatment and unlikely to do so, and the report speaks feelingly of the need for more beds for the chronic sick

The outlook for chronic rheumatism is commonly thought to be gloomy, and it is therefore inspiring to read that only a small proportion of cases had relapsed within two years of treatment In 85% of cases, as found by follow up, the improvement resulting from treatment in the unit had been maintained Moreover rheumatic patients are often capable of reablement and a return to work When a group of 25 patients from the rheumatology wards referred to the disablement resettlement officer were compared with a group of 23 patients referred from the general wards, the likelihood of getting a patient back to work was (allowing for the fact that the rheumatic patients were on an average 9 years older) about equal in the two groups

Research is going forward on the use of controlled force in the treatment of flexion deformity of the knee and into the mechanism of ulnar deviation of the fingers The degradation of hyaluronic acid, characteristic of almost all rheumatic diseases, is being studied in relation to the levels of ascorbic acid and alkaline phosphatase in the synovial fluid, and the small quantity of adrenocorticotropic hormone in the hands of the unit is to be used in conjunction with this work Cortisone remains for this and many other units, out of reach

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4 Choremis K, Vrachnos G *Lancet* 1948 ii 408
5 Choremis K Constantidines V Pantazis S, Kyriakidos B Zervos N *Helleniki Iatrika* 1950 5 5
6 Smith H V Vollum R L Cairns H *Lancet* 1948 i 627
7 Choremis K Zervos N, Constantidines V Pantazis S *Ibid* 1948 ii 595
8 S I 1950 nos 1213 and 1214 H M Stationery Office 3*d.* and 2*d*
* And salts

Prof W E LE GROS CLARK, F R S, who holds the chair of anatomy in the University of Oxford, and Prof F G YOUNG, F R S, who holds the chair of biochemistry in the University of Cambridge, have been appointed to be members of the Medical Research Council from Oct 1

INTERNATIONAL CONGRESS OF PÆDIATRICS

Sixth International Congress of Pædiatrics, Zürich from July 24 to 28, was attended by over 3presentatives from 56 countries The largest ras from the United States, but the highest pro from a country outside Switzerland came from l, over half of whose pædiatricians attended rangements were carried out with characteristic efficiency, and there were numbers of voluntary , including many students, to show the members answer questions, and generally ensure that hing went smoothly

the opening session, the Kongresshaus was ated with the flags of the nations taking part, delegates were welcomed by Prof G Fanconi h) president of the congress He spoke first in h, then in English, German, Italian, and Spanish, and that the importance of international cooperation especially realised in Switzerland, a small country unded by great neighbours and having four ent languages of her own He was glad to see that many German speaking doctors had come, and he d that the congress might be a means of helping man pædiatrics, which, like other branches of medicine science, had suffered such a setback under the régime He regretted that the Russian delegates not, after all, been able to come

peeches of welcome were also made by Dr Ph Etter, ral councillor, and Dr Martin Bodmer, vice ident of the International Committee of the Red ss There followed a pleasant ceremony when orary doctorates were conferred by the dean of the ich Faculty of Medicine on Dr Arvid Wallgren, fessor of pædiatrics at the Karolinska Institut, ckholm, and on Dr James L Gamble, professor in the rvard University Medical School Dr Gamble, ortunately, was prevented by illness from receiving degree in person

Dr Henry F Helmholz (Washington) put forward lan for an *international pædiatric organisation*, and at neeting of national representatives later in the week proposals were adopted, with slight modifications, d the International Pediatric Association was formed objects will be to promote closer relations between diatricians of all countries by holding an international ngress every three years, to promote the spread of diatric knowledge, and to cooperate with other encies concerned with the improvement of child care, diatric education, and research in all parts of the world Other papers at the opening meeting were read by of Robert Debré (Paris) on *streptomycin* and by of. F Gomez (Mexico), who described the successful atment of *malnutrition* with a diet of purely vegetable gin

SOCIAL PÆDIATRICS

At the second plenary session, held at the end of the ek, Prof Alan Moncrieff (London) emphasised the portance of morbidity as well as of mortality figures preventive medicine, and quoted those of Smellie m the Children's Hospital, Birmingham Respiratory ct infections are now the most frequent in infancy, l burns and accidents the commonest cause of death older children so preventive measures should be ected especially against these groups Turning to psychological side of social pædiatrics, Professor ncrieff mentioned the categories of *Children in uble*—orphans, those from broken homes, neglected in moral danger He emphasised that each group numerically very large, and told delegates what being done in this country under the Children's and by y agencies to help these

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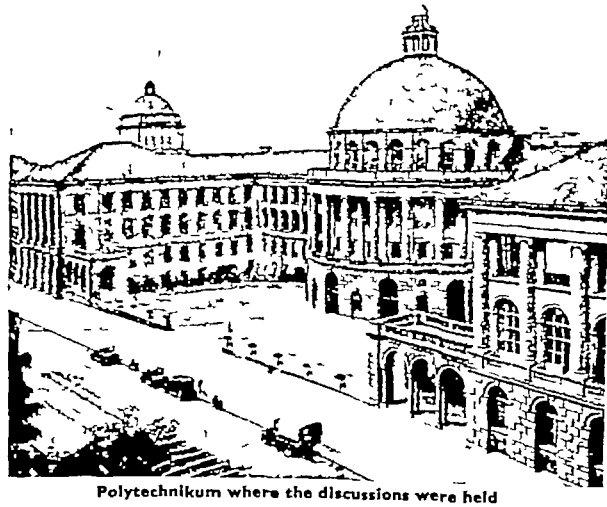


Polytechnikum where the discussions were held

(London) spoke on the assessment of the severity of hæmolytic disease of the newborn, and Dr JOHN MURRAY (London) on the inhibition of hæmagglutination by fatty extracts from blood and other tissues

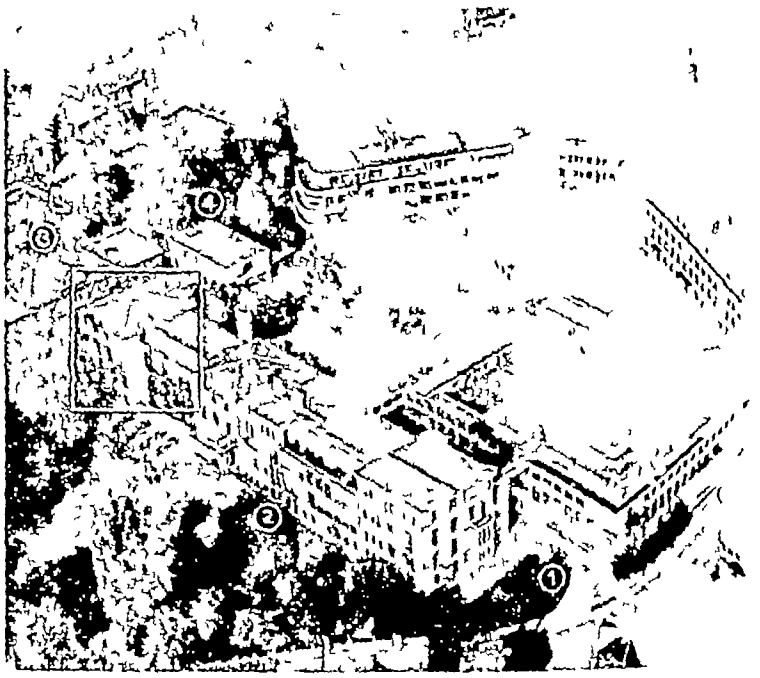
In the section on *diarrhœal diseases* Dr DOROTHY H ANDERSEN (New York) gave an account of the differences between cœliac disease as seen today and as classically described by Gee Dr W K DICKI (The Hague) found that, whereas wheat and rye flour caused deterioration in a group of patients with cœliac disease, their replacement by maize or rice flour and wheat or maize starch was followed by a return of appetite and lessening of steatorrhœa Dr H A WEYERS (Utrecht) described observations by van de Kamer and himself in which the coefficients of absorption of saturated and unsaturated fatty acids were determined daily in cœliac disease Wheat flour induced a high excretion of both and it was found that, on a diet containing wheat flour and poor in saturated fatty acids the amount of the latter excreted was actually greater than that ingested The difficulty in cœliac disease could not therefore be merely one of absorption, and a disturbance of intermediary metabolism was postulated

Of great interest were the discussions on the *prevention and treatment of virus, bacterial, and protozoal diseases* Dr JOSEPH STOKES (Philadelphia) mentioned the possibility of immunisation by the administration of attenuated virus by natural routes instead of by injection, and Dr F O MACCALLUM (London) gave an account of acute aseptic meningitis Dr T F McNAIR SCOTT (Philadelphia) described the work of his virus diagnostic laboratory, and Dr PHILIP EVANS (London) spoke on poliomyelitis following injections Dr RALPH V PLATOU (New Orleans) and others discussed the treatment of congenital syphilis in a session held jointly with the Union Internationale contre le Péril Vénérien, which was also meeting in Zürich The pædiatric uses of 'Aureomycin' and the newer antibiotics were detailed by Dr SAMUEL KARELITZ (New York), and Dr SYDNEY ROSS (Washington) spoke on 'Chloromycetin'

Dr GEORGE W THORN (Boston) opened a symposium on *Adrenocorticotropic Hormone and 'Cortisone,'* and Dr RUSTIN MCINTOSH (New York) spoke on their effects in the nephrotic syndrome There were contributions also from Finland, the Netherlands, and Denmark

In the section on *surgery in childhood*, interest naturally centred on neurosurgery and thoracic surgery Prof DOROTHY S RUSSELL (London) gave an account of the pathology of hydrocephalus and Prof NORMAN DOTT (Edinburgh) of its surgical treatment Dr JAMES H HUTCHISON (Glasgow) spoke on the management of bronchiectasis of tuberculous origin, and Mr T HOLMES SELLORS (London) on the surgical treatment of bronchiectasis

Dr HELEN TAUSSIG (Baltimore) described the clinical manifestations of congenital heart malformations amenable to surgery Dr SIGURD EIK (Oslo) spoke on the radiology of these malformations, Dr ANDRÉ COURNAND (New York) on cardiac catheterisation and Dr AGUSTÍN CASTELLANOS (Havana) and Dr JOHN LIND (Stockholm) on angiocardiography Dr EDGAR MANNHEIMER (Stockholm) gave an account of the postoperative course of 77 cases of morbus cæruleus and also read a paper by Dr C CRAFOORD (Stockholm) on the surgical treatment of coarctation of the aorta In the discussion which followed, Dr Taussig and Mr Holmes Sellors gave their postoperative results, and the indications for pulmonary valvulotomy were discussed



General view of the Children's Hospital The oldest part of the building is shown in the
1 Main entrance 2. Main building 3 Staff quarters 4 Laundry 5 Infectious
6 Observation wards 7 Nurses home 8 Lecture hall 9 Policlinic.

In the surgical section other papers were by Dr OLAF SWENSON (Boston) and Dr PHILIP SANDBLOM (Stockholm) on the surgery of malformations of the œsophagus Dr Swenson also dealt with *rectosigmoidectomy for Hirschsprung's disease*, and Dr MARTIN BODIAN (London) with the pathology of this condition

In the section on *neurology and psychiatry*, Dr MILDRED CRIPAK (London) spoke on Heller's dementia and a number of papers on electro encephalography were given including one by Dr DENIS HILL (London) There was a nearly all British discussion on cerebral palsy, with contributions by Dr LAURETTA BENDER (New York) Dr PHILIP EVANS, Prof D R MACCALMAN (Leeds) Prof N B CAPON (Liverpool), and Dr G D S ACTON (Carshalton)

The remaining communications included papers by Dr C F DENT (London) on *disorders of amino-acid metabolism*, and by Prof A ST G HUGGETT (London) on *placental causes of fœtal abnormalities and death* Dr JACK METCOFF (Boston) spoke on the results of clearance techniques in the *nephrotic syndrome*, and Dr BERNARD SCHLESINGER (London) on the blood and bone marrow findings in *Still's disease*

Exhibitions and other Activities

Over 200 demonstrations were given in the gymnasium of the Kantonsschule, and it would have been easy to spend the whole week admiring and studying them

From this country were exhibits by BICKEL HICKMANS BAAR and DOUGLAS (Birmingham) on the *Debré-de Toni Fanconi syndrome* and by BODIAN (London) on *Hirschsprung's disease* R E A DEAN and McCANCE and WIDDOWSON (Cambridge) presented the results of studies on *nutrition and growth*, and DIX (London) gave a demonstration, and showed a film of the 'peep show' technique of *pure tone audiometry* LIGHTWOOD and PAYNE (London) had an exhibit of 22 cases of *infantile renal acidosis* and SMALLPIECE DUNSTED (Oxford) one of *meningitis due to gram neg*

Surgical demonstrations were given by DENIS London) on the treatment of various *congenital* and by HOLMES SELLORS (London) on *ectopic lung al pulmonary arteries*

he other exhibits, those of COCCHI (Florence) on *logical pathology of the cerebrospinal fluid* and of (Boston) on *electrophrenic respiration* attracted attention

programme of excursions and visits included the Kinderspital and the new Kantonsspital refugee orphan children's village Pestalozzi at The social arrangements included a steamer e lake of Zürich, and a dinner followed by folk l dancing, while there was a full programme of s and "guidances" for the ladies

Those who know best the lakes and mountains of Switzerland may have been surprised to find how beautiful her largest city is also, the spaciousness, the abundance of trees and flowers, and the lakeside setting made a perfect background for a memorable congress Members will remember above all the kindly hospitality of the Swiss, who received so many into their homes and those who worked so hard to make the congress a success—Prof Fanconi the distinguished president, Dr Zellweger the general secretary, Dr Gasser chairman of the exhibitions, and Dr Rossi who had the enormous task of arranging accommodation

The next International Congress of Pædiatrics will be held in Havana in 1953 under the presidency of Prof Félix Hurtado

Special Articles

TIONAL COSTING FOR HOSPITALS ON A "STANDARD" BASIS

D M LIVOCK
A C A

ARD costing is an accounting technique whereby of any enterprise can be compared with a fixed —the standard cost—and the reasons for any n from that standard are shown in relation to all nts of the cost It combines the usual financial ng with information about current costs, and it learly the reasons for the difference between cost and the standard In the past standard has been applied in this country solely in industry been found of great value to management as a of control Probably the full application of the o hospitals is impossible, but there is no reason underlying principles should not be adapted tal finance

ow widely acknowledged that functional depart costing will enable comparisons to be made the cost of similar services given in similar s (For example, the cost of feeding a patient not vary greatly from hospital to hospital, and arison of the cost of a unit of heating should give ming information on the economics of the different s in use) But the defect of departmental cost- method of control is that it does not distinguish n variable and fixed expenditure, and estimates on past departmental cost are entirely vitiated ges take place in the usage of the department re based on standards it would give departmental d at the same time enable budgets to be adjusted current changes in the volume of service given

A PRACTICAL DEMONSTRATION

experiment in departmental costing on a standard is been started in coöperation with the Nuffield al Hospitals Trust in a provincial teaching hos Here it happened to be desirable to know the each ward and the system as applied is more ted than would be necessary in other teaching s, and certainly in non teaching hospitals A artmental costing system had been in use at the for the past ten years, and the introduction ndard was fairly simple, since all the relevant tion was available The new system began 1, 1949

ospital organisation was divided into departments re regarded as cost centres. These fall naturally main groups

ice' departments providing services used by other ents and not directly concerned with diagnosis or tment

"Patient' departments concerned directly with patients and contributing to diagnosis and treatment

For each department a unit of production was chosen (table I) For service departments the unit is one which bears relation to the services given to other departments and which can serve as the basis of the allocation of their cost to patient departments For patient departments the unit is one which will best enable the cost of various treatments to be compared, and which will allow the cost of a patient or of a patient day to be calculated showing the different components of the cost, such as the maintenance cost of a patient and the cost of the special treatments and diagnostic services used by the patient

The estimate of the first standard cost per unit was reached in the following way

An estimate was made of departmental expenditure for the year based on information for the past adjusted to cover known changes in the future This was the first standard cost

An estimate was then made of the number of units which each department would produce during the year, based on information for the past of total possible production adjusted if necessary to the number which it was thought would be required from the department This was the first standard number of units

A simple division of the standard number of units into the standard cost gave the first standard cost per unit

These first standards were of course far from reliable, but a start had to be made somewhere At the end of the

TABLE I—MAIN HOSPITAL DEPARTMENTS AND UNITS OF PRODUCTION

Service Departments	*Unit of Production*
Works department	Man hours
Boiler house	Tons of fuel used
Laundry	Pounds washed
Kitchen	Meals served
Sewing room	Pieces repaired or made
Staff canteen	Meals served
Staff residence (domestic nursing medical &c)	Staff days
Training-schools	Trainee days
*Chapel	Patient days
*Telephone	New outpatients and new inpatients
*Administration	New outpatients and new inpatients
Patient Departments	
*Almoner	New outpatients and new inpatients
Ambulances	Miles run
Dispensary	Prescriptions
*Records and admission	New outpatients and new inpatients
Laboratories	Specimens examined
Radiology { diagnosis	Investigations made
Radiology { treatment	Treatments given
Physiotherapy	Treatments given
Occupational therapy	New inpatients
Operating theatres	Operating hours
Outpatients	Attendances
Casualty	Attendances
Medical wards	Patient days
Surgical wards	Patient days
Special wards (e g maternity children E N T neurosurgery long-stay pay beds &c)	Patient days

* In these departments it is difficult to say that any unit is produced and the unit given is the one used as a basis for the allocation of cost to the other departments

TABLE II—DEPARTMENTAL OPERATING STATEMENT FOR 12 MONTHS FOR A 30-BEDDED WARD WITH 80% OCCUPANCY THE STANDARD NUMBER OF UNITS IS 8760 PATIENT-DAYS, THE ACTUAL UNITS 8000 PATIENT-DAYS VARIATION DUE TO THIS DIFFERENCE IS SHOWN AS A PERFORMANCE VARIANCE IN COL 6

—	(1) Standard cost	(2) Standard cost per unit	(3) Standard cost of actual units	(4) Actual cost	(5) Variance between cols 3 and 4	(6) Remarks
Materials	£	£ s d	£	£	£	
Provisions (V)	1095	2 6	1000	960	− 40	
Drugs (V)	876	2 0	800	780	− 20	
Dressings (V)	438	1 0	400	420	+ 20	
Stationery	219	6	219	200	− 19	
Cleaning Materials	219	6	219	240	+ 21	
Other	438	1 0	438	500	+ 62	
Labour						
Nursing	4380	10 0	4380	4880	+500	
Domestic	3066	7 0	3066	3100	+ 34	
Other	2190	5 0	2190	2050	−140	
Overheads						
Rates and Insurance	219	6	219	220	+ 1	
Gas	328	9	328	300	− 28	
Electricity	219	6	219	250	+ 31	
Water	219	6	219	220	+ 1	
—	13 906	1 11 9	13 697	14 120	+423	*Performance variance* £309 [illegible] *Actual cost per unit* £1 13[illegible] [illegible]

Only those items marked (V) would vary directly with a variation in the number of units, others would vary to some extent

first year the standard was revised in the light of the information then available and of a more precise definition of departmental expenditure and activity

Expense is allocated to departments as it is incurred This arises from three main sources—direct cost of materials, direct cost of labour, and indirect cost

Direct cost of materials consists of materials purchased especially for the department, materials issued from stores, and, in patient departments, drugs issued from the dispensary and the cost of patients' food Each source is separately accounted for so that variances in cost may be easily seen and traced to their cause Materials issued from stores are grouped under the same headings as the supplies officer uses for the stores' records Materials are priced out to departments at a standard price, and any variance appearing on the departmental statement thus arises from differences in consumption, and the effect of price variation is only shown for the hospital as a whole

Direct cost of labour is arrived at by an analysis of the hospital pay roll Variation will occur through changes in hours worked and in rates of pay

Indirect cost consists solely of those items of expenses attributable to the buildings as a whole and is spread over departments on an agreed basis

A periodical statement is prepared for each department comparing the actual cost of its running with the estimated standard cost (table II) A summary of these departmental statements shows the position for the hospital as a whole If it is thought necessary to arrive at the total cost of any patient department, a further statement is prepared showing the allocation of the cost of service departments to the patient department

DISCUSSION

I have given no details of the method employed in this particular hospital in arriving at the costs, for the idea of working on a standard basis was grafted on to an existing system originally designed for other purposes[1] But the experiment is an attempt to provide information for the use of the administration and for purposes of comparison When similar experiments have been carried out in other hospitals or groups of hospitals it will be possible to arrive at some idea of the best methods to be employed, of the cost of costing, and of the best use which can be made of the results

But it seems clear that a system based on these principles has the following advantages

It affords a scientific basis for annual estimates

It gives an automatic control over budgets consumption, and stock, more especially as the original estimate is varied according to changes in the services produced

By basing departmental analysis on a standard shows the result of variation in price of materials change in price levels or in buying policy

It enables each departmental head to be aware of in such expenditure as he is able to control

It provides a basis for comparison of hospital cost at national or regional level by a comparison between standard cost of departmental units of production in hospitals and between the number of units produced

It would in the course of time enable a standard cost ascertained for all hospital departments from standard cost could be built up for individual according to the departments they contained [illegible] would provide a method of control of expenditure at [illegible] and national levels

When cost information is available for a number of and for a period of years, it should give a useful of the best size of departments and hospitals, and of the efficient methods of providing various services, and it enable estimates to be made of the cost of the provision additional services Variation in the standard cost of ments in individual hospitals should show the effect of bed-occupation and of varying methods of administration

The statistics automatically collected for arriving at costs can be used for other purposes They can, [illegible] show to what extent the special departments are used different types of patient

Now that financial control is vested in hospital ment committees dealing with a group of hospitals, unit of administration is big enough for the system to be properly planned and organised. such a unit the analysis of expenditure under [illegible] mental headings, rather than the headings of [illegible] at present required, should not entail any great [illegible] labour, especially as some mechanisation would possible The collection of the other data [illegible] the calculation of the standard cost could [illegible] be made part of the accounting system, and could be obtained from patient records without alteration or addition But it is important, the the fullest use is to be made of any costing information should always be up to date. It must available as soon as possible after the end of financial period, and each period should not be too

To introduce costing, however, will not by ensure efficient administration Costing is not a cure inefficiency, though it is as essential to good management as the use of X-ray and other diagnostic [illegible] are to a good doctor But the results must be presented in a useful and intelligible form to the administrator who must be willing to accept and use this new effective weapon

[1] This system was described in the *Accountant* 1940, 102 45

EDICAL SERVICE FOR AUSTRALIA

)M AN AUSTRALIAN CORRESPONDENT

'en a lost year in the last twenty that did not abortive solution to the economic problems practice in Australia But it now seems that soundly based is coming to fruition

ome put forward by Sir Earle Page, F R C S, inister of health, is based on a combination ient aid with nation wide voluntary insurance kness and disease This partnership is a that both State and individual have obliga ie national health scheme, and it will use all ons and organisations that have been built up unes to assist in the restoration of health eption leaves everyone free—the doctor, the ie hospital management and staff, the chemist, oluntary or insurance organisation

w Australian scheme has been based on the principles

st must be within the financial compass of the al and the nation and able to be controlled by surer

lan should contain within itself automatic checks trols on costs, on abuse of the time and skill of on the waste of expensive medicine and diagnostic nt, and on the inefficient and uneconomical use of beds

must be no interference with the personal relation doctor and patient

atient should be given a definite sense of personal al responsibility

willing coöperation of doctors, chemists, hospital ments, voluntary organisations, insurance societies, uld be secured by leaving in their expert hands as f the administration and control of the scheme as ble

ing agencies and methods that have proved so in the past should be used to the greatest possible

must be an element of permanence in the plan to development and extension of the machinery that idle with confidence new problems

effect of the scheme must be to raise the level and d of medical care and treatment, and not to degrade build up the self respect and morale of the people e and not undermine it, to stimulate progress in of healing and encourage continuous research

is attempts have been made in different countries ialise medical treatment or to give free treatment xpayer's expense These over simplified solutions ved wasteful in their administration, disastrous quality of treatment, and destructive of the f the people Effective control was impossible ing coöperation of the medical profession has t, and governments have been unable to budget proximately for their financial commitments or limit them If the quality of treatment declines, health must suffer, and this must occur also if the es that previously spurred doctors to give devoted re being destroyed

hallenge therefore is thrown out to Australia very modern society as to how advantage can of our great advances in knowledge and the kept within the means of the people If Australian and intelligence can satisfactorily answer this the best minds of the community will be to the healing art and the future of medicine ical practice assured

iterion of success of a national health scheme e a decrease in the sickness rate of the com the sign of failure is that more medicine is nd more treatment becomes necessary Sir ge is confident that voluntary insurance, with ent aid to deal with special classes and to deficiencies in the period and extent of the ssistance due to the actuarial limitations of the insurance available on the premium charged, will solve the problem There will be free choice of doctor and no interference with the doctor patient relationship Plans and organisation will be the result of coöperation between the consumers and providers of the medical service There will be a minimum of governmental interference and control, and a definite incentive to improved standards

For generations, voluntary insurance has been the standard method of dealing with risks Voluntary insurance involves a minimum of interference with the traditional life and activity of the community Voluntary insurance has been invaluable against all unpredictable risks such as sudden death, shipwreck, theft, and fire Should not voluntary insurance against unpredictable risks of disease prove just as valuable as in these well tried cases ?

In Australia there are over 5 million life assurance policies with annual premium payments of over £35 million, giving voluntary insurance cover for over £1000 million Accident and sickness insurance companies cover hundreds of thousands more people Friendly societies insure over 600,000 families against sickness and medical treatment amongst other risks The various hospital insurance funds insure well over half a million There are many medical and hospital benefit insurance organisations associated with trade unions covering at least another half a million families

STARTING THE NEW SERVICE

The new scheme is to be implemented in two stages, and there are four phases to the first stage

Improvement of nutrition by the provision of milk daily to all children under the age of 12 years Distribution of the milk will be arranged in coöperation with State governments and will relieve them of the responsibility for the cost of this service

Prevention of disease by a national health educational campaign and by the free provision, on a doctor's prescription, of costly, specific life saving and disease preventing drugs, and of drugs necessary for certain chronic illnesses Abuse will be checked by professional disciplinary committees composed of representatives of the medical and pharmaceutical professions

Curative measures for serious disease by contributions towards hospital costs and maintenance, through subsidised hospital insurance schemes, provided in such a way as to restore to hospital managements the control of hospital administration. This contribution will both relieve patients' expenses and substantially assist hospital finance

The relief of the high cost of medical treatment by combined voluntary insurance and governmental benefit up to 90% of the cost of medical treatment Abuse of these benefits will be checked and controlled by the patient still paying part of the doctor's fee and by the supervision of voluntary organisations which disburse the benefit These organisations will provide from their own funds an amount at least as much as that provided by the government Advisory committees of doctors chemists, and voluntary organisations will be formed also to supervise this benefit

Special provision will be made for medical service to the indigent and to old-age, invalid, and widow pensioners, the temporary unemployed, and other selected classes

The second more comprehensive stage of the scheme will deal with the capital cost needed to place the national health machinery in an efficient and up to date condition, and can only be tackled after exhaustive discussions with State governments, universities, medical schools, managements of teaching hospitals and of regional, base, and country hospitals, and with other bodies associated with the care of the sick, with nutrition, and with health

Both stages will be designed to ensure a progressive improvement in all phases of medicine—from teaching and research through to actual practice and the training of medical graduates Both stages will aim at restoring

the position, prestige, and fullest usefulness of the general practitioner The proposed administration will avoid the creation of any large numbers of new public servants

A list of free drugs, drawn up by a specialist committee of the British Medical Association, is to come into operation on Aug 14 The list includes the sulphonamides, insulin, streptomycin, penicillin, vaccines, intravenous protein hydrolysates, and other solutions and new expensive drugs not yet in general use

The doctor uses his own prescription form or a government form as he chooses The prescription is given in duplicate When handed to the chemist, these prescriptions are made up without charge to the patient The chemist will receive from the government the fee for the prescription according to an agreed schedule It is estimated that this part of the plan will cover 2% of the prescriptions at present compounded In serious illness 70% of the cost of drugs would be met The cost of this part of the scheme is estimated at £2½ million a year

The pensioner group, who with their dependants number about 1 million, will receive an enlarged service of free medicine to cover their more common ailments Apart from this group, there would be no means test in the operation of the scheme

Insurance schemes cost 6*d* per week for single persons without dependants, and 1*s* per week for a man, wife, and dependants under the age of 17 With the government subsidy, this payment would cover 90% of medical costs

A public opinion poll shows that 46% of the public think that all medicines should be free, 34% only want the expensive drugs supplied, 11% think none should be free, and 9% have no opinion

Public Health

Poliomyelitis

In England and Wales notifications in the week ended Aug 5 were paralytic 262 (197), non-paralytic 105 (108), total 367 (305) Figures for the previous week are shown in parentheses

The following county areas, with notifications as given, contributed some 69% of the total notifications in the week under review

	Paralytic	*Non-paralytic*
London	16	12
Essex	14	3
Gloucester	6	5
Lancaster	15	7
Middlesex	8	3
Northumberland	8	6
Southampton	8	3
Stafford	21	12
Surrey	10	2
Warwick	24	14
Worcester	21	5
Yorks (West Riding)	18	6

The total increase for the week of 62 compared with the previous week was due to larger numbers of notifications in a number of counties, of which the more important were Hertford, Kent, Lancaster, Lincoln (Holland, Kesteven, and Lindsey), Northumberland, Stafford, Surrey, Worcester, Yorkshire (West Riding) Notifications of non-paralytic cases dropped to 29% of the total compared with 35 4% in the preceding week

Cases notified in the Isle of Wight in the week ended Aug 5 were paralytic 4, non paralytic 3, and numbers have since increased to a total of 28 confirmed cases including 26 paralytic, reached on Aug 12 The medical officer of health has advised that visitors with children should not visit Freshwater and Newport for the time being This advice does not apply to the rest of the island Up to Aug 13, there had been no notifications from the main coastal resorts on the Isle of Wight

In England Now

A Running Commentary by Peripatetic

There are times when I can only conclude hospital administration was built up without for the patients "How smoothly our department would run," one can imagine a strator saying to his junior, "if there sick people all over the place" At times seems that they—the mysterious "they" hospital—go on strike and refuse to admit patients

My patient must have been caught in such Her nose had been destroyed by lupus and a teaching hospital a pedicle graft was taken to as a preliminary to repairing the damage next 2 years she wrote and telephoned say the pedicle was well and strong and ready moved to higher places Seven times she replies of increasing terseness from "them" to would be notified when a bed was ready

She was a humble and placid soul and finally accept the fact that her pedicle was destined on her arm It is twenty years since she last reply

"Would you like it done now?" I asked she replied "I have got used to my nose pedicle is useful for tucking my hankie in"

* * *

THE COMMITTEE MAN
OR
FROM WHITBY TO WHITLEY

1 I've travelled to London by sleeper I've tra
London by plane
In Winter it's freezing in Summer it's
Springtime it's raining in Autumn it's
I've tried all the trains and I hate all the lot,
10 25 to the 1 o'clock Scot
I'm fed-up, I'm finished I feel that I ought
quietly at home but I'm off like a shot,
And I travel all over again

2 Agenda are written on yellow, agenda are w
white,
And, would you believe it, agenda on pink.
What a queer use of paper—a queer use of in
Just to gather our facts, just to coax us to
Just to bind us together—to strengthen a lin
Between Counties and Countries—to lead us
Our Committee is dazzled, but knows itself

3 We marched to the Ministry in Whitehall
Tavistock Square we passed—
The Surgeons, the Physicians,
The newborn Obstetricians,
Housed our arguing Clinicians,
Seeking tactical positions,
For their "Terms and Conditions,"
Keep step—Eyes right—Stand fast

4 But now a faint nostalgia dulls our senses
There's lingering love for days not long ago.
What boys we were! Consultants' best defe
Were us—or so we thought—none saying
Oh Whitley Council's come to Town, come
come to Town,
Whitley Council's come to Town, come to
stay

(If the reader has strength he now reads verse

* * *

The annual sports day at my daughter's sch highlight of the local summer season Mother their housewifely cares and kitchen aprons, and hours parade in all their glamour, furtively other mothers and making sibilant comments friends on the subject of suitable dress for the The mothers are ensconced in deck-chairs side of the sports field, while fathers lurk under the trees in the background, perspiring

(in vain) that they will not be called on for
' race
is in the 10–12 year group, and being a long
for her age, won a sprint race and was second
a jump Flushed with my success—I should
tioned that my group of fathers was betting
3 win, 3d place)—I determined to risk all my
on the last event of the day, the brothers and
e Young Peter is only three, and I managed
ne good odds Sure enough, in the first heat
ped him firmly by the hand and won in a canter,
ink Peter's feet touched the ground more than
he 30 yard course
e, in the front row of the stalls, was beaming
when the finalists lined up at the starting gate,
ood to win at least 5s if my pair came home
ortsmistress raised her pistol, and then—
y! I want my POTTIL!" Every mother along
instinctively alerted, but I knew Peter's voice
as there first I pleaded with the mistress to
e the start I argued, I cajoled, I told her of my
l habilities, but all to no avail The race must
Sadly my daughter returned to her mother,
eter and I wended our way, the cynosure of all
the schoolroom toilet, sadly I rejoined my friends
he trees I suggested that all bets were void, as
m had not come under starter s orders, but I was
led Is there any other owner trainer whose entry
en scratched for incontinence?

* * *

t a grease smear on a suit soon after we got to
ca The dry cleaners failed to remove it by routine
y Rather than risk more heroic measures, I
ed a simple Anglo-Saxon could save his dollars
olve the problem with a little petrol, so I plunged
e of rag into my Austin's tank on the end of a piece
ce and pulled The wire came back with my hand,
o my horror, the rag stayed behind
ny people tried to get it out last week I fished
my wire, the "gas station" men drained the tank
probed about with various gadgets, friends joined
un from time to time but got hot and irritable trying
move the tank, shining torches down the spout,
so on All was in vain, the rag remained in situ,
nace to the fuel system The family drivers were
ed of the risks of a sudden blockage of the petrol—no close overtaking in traffic to show off the performance of the British car, and no long cross country
, until the rag was out Meanwhile, new plans were
When no-one was about to give advice we bought
ne-cent fish hook, attached it by a thread to the
cap, and washed it down with a few gallons of gas
returned home computing the chances of a catch as
pumped over the roads
unnily enough, we forgot (? suppressed) all about this
for several days—indeed, until an hour ago Then
lled on the thread, and there was a distinct resistance
tly, slowly, with coaxing and prayers, the thread
e on, and out came the rag, red-dyed! The gas-
ion men had gone home when I got there to tell them,
I had to share my triumph with someone
y wife got the spot off my suit several days ago with
e turpentine she found Women are so practical,
men, men are inspired

* * *

ow that the Channel swimming season has once more
ed I will reveal two plans of my own I am training
tadpole, Ena, to make her attempt towards the end
e month I anticipate that the Adaptation Syndrome
apply here, and I shall therefore give Ena 'Cortisone'
ng her 'exhaustion phase" What this will do to the
animal I cannot imagine, but I shall be content if
does not metamorphose before reaching Dover
h also organising a mass swim by the two thousand
ents and three hundred and forty staff of my hospital
gard this as a Pilot Scheme which will doubtless be
wed by others on a larger scale The occupational
apy department has completed the training pro
ame, and when the Great Day arrives I hope to have
whole hospital breast-stroking off Bournemouth
in ten minutes of the start The order of precedence
still to be settled the M S will lead us, but does
D S or the S H M O bring up the rear?

Letters to the Editor

FIRE

SIR,—Your annotation on fire and burning accidents prompts me to send you some stop press news The Registrar General's report for 1948 shows that the deaths from burns and scalds have again dropped—from 1266 in 1938 to 838 in 1947, and now to the record low figure of 620 in 1948 In terms of the population at risk that means a drop of from 30 per million in 1938 to 14 per million in 1948 (The corresponding figure for the United States was still 31 5 per million in 1947) The falling death rate in this country should not, however, be taken as ground for complacency If, as I suspect, it means rather the recovery of a larger proportion of severely burned people than a reduction of the total accidents, the prevention of these burns is still a matter of great importance—because the severely burned people who recover represent a formidable occupancy of hospital beds, and many of them recover as sub efficient, unhappy people

The Registrar General's report brings out another striking fact for the second year running the most common cause of fatal accidents by burning was not contact with an open fire but *with an electric fire* In other words, these fires have now become "the outstanding hazard of the English home", 59 deaths are ascribed to them in 1948 as compared with 46 to coal fires and 30 to gas fires And it must be remembered that the non fatal burns from each of these causes amount to about 10 times these figures

The effective guarding of electric fires becomes, then, a matter of urgency But, as your annotation points out, the protection of the public against this menace is still not in sight The long drawn out deliberations (they have lasted more than 3½ years) of the committee of the British Standards Institution have not yet produced any agreed specifications of safety for electric and gas fires Indeed the situation is worse than that the committee has reached a deadlock, because the makers of gas fires will not agree with makers of electric fires So we are back where we were in 1947, when the committee was set up, and in the interval, something like 150–200 people have lost their lives—and about 10 times as many have been seriously injured—by contact with unguarded gas and electric fires I submit that if the representatives of the manufacturers of these fires (and the B S I committee is largely composed of them) had displayed real concern to stop the supply of these dangerous fires to the public, specifications of safety could have been drawn up within 6 months—perhaps within 3 months Even if agreement should, some day, be reached by makers of fires upon the specifications of safety there is still no guarantee that all makers will conform to those specifications They are not required by law to do so

Is it not time that the task of defining the specifications of safety should be assigned to an independent body of technical experts whose findings the makers of fires would be required by the Government to accept? Why should England be the last country to protect its children and old people against this very obvious hazard in the home?

There is one more item The fireproofing of inflammable cotton clothing materials seems now to be somewhat nearer I have recently tested some unbleached calico and a finely woven patterned cotton print treated by the 'Erifon' process (salts of antimony and titanium) introduced recently by Messrs DuPont in America

The untreated material flamed fiercely as soon as it touched the candle flame used for the tests, and was reduced to a fine meshwork of ash within 15 sec The treated material, in contact with the candle flame or the element of an electric fire for 3 sec, did not burst into flame it developed a line

of "glow" at the point of contact with the source of the heat This glow slowly extended (it did not break into flame even if fanned) and extinguished itself within 20–40 sec Only a small portion of cloth was destroyed by the glow

Precisely the same result was obtained with samples of treated fabric soaked overnight in (1) tap water, (2) rain water, (3) soap and tap water, (4) soap and rain water, (5) then—in each case—washed in the normal way, and (6) boiled twice, for 30 min each time, both in tap and rain water

Clearly the flame resistance—however it is achieved—is remarkably "fast" And I am informed by independent observers in America that the materials have shown no deterioration or loss of flame resistance after exposure out of doors for several months to hot sun and weather The colours of the printed fabric I have seen are not quite so bright as those of the untreated sample, its feel is not appreciably harsher I am informed that patch tests (for toxicity) were made on about 190 people in the DuPont laboratory (though no actual tests have been made of toxicity for children), and that "ingestion tests were made on animals"

The new process seems to carry us some way towards safer clothing, though it does not appear to give 100% flame resistance since the proofed material will burn if it is doubled over the elements of an electric fire (thus presenting a larger surface to the heat) The process does undoubtedly confer a considerable margin of safety, however, and I think one may assume that 3 times out of 4 a frock or nightdress made of such proofed material would not burst into flame from a momentary contact with a fire (as our present cotton and viscose rayon clothing will do), and that if a glowing point was established by such contact the glow would easily be put out

It is not yet certain whether the new process can be applied equally well to the cheap raised cotton fabrics, such as flannelette and winceyette, which are so extensively used by the lower wage earning classes, in whose homes most of the burning accidents occur Moreover, the economic problem of producing these cheaper proofed fabrics at competitive prices has yet to be overcome But it must be remembered that we already have to pay a very high price for the care of so many seriously burned people The new process certainly seems worthy of the attention of the Department of Scientific and Industrial Research

Farnham Royal, Bucks LEONARD COLEBROOK

THE SCHOOL MEDICAL SERVICE

SIR,—Prof Alan Moncrieff's Dawson Williams lecture[1] on the reorganisation of the infant welfare clinics and school medical services was most timely, and with regard to the former it contained excellent suggestions The school medical service, on the other hand, could and to some extent does meet a real need

The intensive propaganda for health of the pre school child, immunisation, food and vitamin supplements—in fact all the mechanical aids which could be supplied, joined with the parent's interest—helped to produce our present healthy babies Nothing could be more profitable than for the infant welfare clinics now to turn their interest to other technically preventable diseases

There has not been any comparable activity for positive health in the school child, nor can the remedy lie in anything as easily administered as foods or injections Yet the importance of the first ten years of life cannot be surpassed by any later impressions, and no one could deny that the latter half of these growing years produces in many homes difficulties the effect of which may be more lasting than the benefits of the earlier age

The school medical inspection is the only reminder to parents that an interest is still the child, and most of them welcome it T attendance there completes the chain of ' ground, school, and health The contact all children with problems—the enuretics, the the asthmatics, the undernourished, the ow to mention only a few—are asked to attend ailments clinic, where time is available and an listener anxious to help

The child whose main illness is his parent who frets and broods but cannot herself in a crowded surgery, though she feel problem does not warrant hospital treatment, those, (some 40% of hospital outpatients) or management difficulties have already situation weighty enough to require specialist and investigation All these and more find to the school clinic at some time during those years

That is why these school clinics could be us as the real centres of preventive medicine, in th tion for healthy adulthood The composite provided by the health visitor, by the teacher's by the history, and by the parents' attitude, is o most complete at present available to any doc competes for pride of place with the family knowledge of the background and character

The final aim of any National Health Serv produce a healthy nation The seed is sown years, and in these days of successful treatment major ailments we ought not to neglect to deal many, common, troublesome symptoms, wh grow large enough to eat up all the fruits of ou efforts

It would require but an acknowledgment of th of these school medical services—and some reductio red tape—to make them a lively, discriminating of the other medical services, to relieve the practitioners, to act as a clearing house for outpatients, and to be of inestimable value to population at large in giving a helping hand problems are in their infancy

By relegating school doctors to plan syllabuses meals and to be concerned with postural defects only should be wasting something the full use of which greatly need

HEDY SYMONDS
Gidea Park, Essex. Assistant School Medical Offi

SIR,—I did not have the pleasure of listening Professor Moncrieff's lecture, one would like to what experience he has of school medical inspection what knowledge he has of its potentialities The ment used by Dr Gordon, and quoted in your annota that "the injudicious doctor may implant a neuros unnecessarily emphasising some harmless or mild tion" is merely a reflection on the doctor and not on principle of school medical inspections Any doctor is capable, either consciously or unconsciously, of im ing neuroses in his patients would be well advise give up the practice of medicine

The School Medical Service makes no claim to curative service, it should be entirely preventiv outlook and application The value of personal individual discussion with the mother on the P aspects of health and the prevention of diseases, as as our present knowledge will allow us to go, is the best forms of health education The school inspection affords an excellent opportunity to this instruction To expect the already over general practitioner to carry out this aspect of h education and preventive medicine is almost bord on the ridiculous

Launceston Cornwall L. RIC

1 Delivered before the section of child health of the British Medical Association and briefly reported in *The Lancet* Aug 5 1950 p 222 with comment on p 218

DRUGS IN PARKINSONISM

th reference to your leading article of June 17, erience with 'Diparcol' 'Benadryl,' Artane,' mum, and we have carried out a controlled bservations comparing artane and diparcol w drug 'Lysivane'

e no hesitation in commending the use of r parkinsonism It is much less toxic than t has a somewhat wider range of effective s than artane, and apparently its effects are ng than those of parpanit The effect on aents is remarkable We have a series of nerly bed ridden and unable to attend to the quirements of hygiene who are now walking l looking after themselves Lysivane, therefore, omion, takes pride of place among the drugs up to date Occasionally it can be combined momium with benefit to the patient, and there ional cases which respond better to artane than ne

f the most interesting aspects of this form of it is its extraordinary effect on the patient's It might appear that this was a result of the al motor effects, but we do not feel that this is a tory total explanation The sense of "being o the spot," which is perhaps the most significant m of parkinsonism, invades the mental aspects of as well as the motor, and we often find that our s treated with lysivane "loosen up" in their nal life in a manner which does not seem to be tonly explained simply in terms of the dis ance of rigidity and tremor

HAROLD PALMER
c Hospital, Dunedin N Z D J A GALLAGHER

ORAMPHENICOL IN WHOOPING-COUGH

—In view of the antibiotic action of chloramphenicol *Hæmophilus pertussis* in vitro and its protective in infected animals, as well as encouraging clinical , a large scale clinical trial has been carried out

gether 25 early cases of whooping-cough were given the Of these, 9 were in the catarrhal stage, 11 were just at rt of the paroxysmal stage (2–5 days), and 5 were rather the paroxysmal stage (5–10 days) All were contacts s of well-developed whooping-cough Of the 25, 20 had, or later developed, a characteristic spasmodic sometimes associated with whooping in the other 5, spasmodic cough did not develop the diagnosis was d by leucocytosis with relative lymphocytosis (over the blood sedimentation rate was normal, and the nent fixation test became positive later in the disease atients had no spasmodic cough for about one month s over the maximum incubation period) during which re in intimate contact with cases of whooping-cough ard.

ie 9 patients in the catarrhal stage, 2 ceased ier to cough in four days, and another 3 continued an insignificant cold like cough for 1–2 weeks, ped, despite the drug, a quite typical, though asmodic cough which continued for 4–6 days, uch they had a mild bronchitis like cough for ks The 9th case was least affected by the treat- she developed a rather severe spasmodic cough sted for seventeen days This patient happened severe diarrhœa for over a week at the start nent, and this might account for the apparent

16 patients in the earlier part of the paroxysmal –10 days) 15 were much relieved by the fourth e improvement affected the frequency, duration, erity of the paroxysms The whole paroxysmal ted 9–17 days and the patients then had a mild is like cough for another 1–2 weeks The 16th patient, however, showed from the fourth day a remarkable improvement in the severity and frequency of the paroxysms, and whooping ceased, but a rather severe spasmodic cough continued for over three weeks This patient was receiving a heavy dosage—80 mg per kg body weight in the twenty four hours for a short period (five days only)

Different dosage schedules were tried, and we feel that the best is 50 mg per kg body-weight as an initial dose, divided into four portions given over forty five minutes, followed by 50 mg per kg body weight in the twenty four hours, divided into six-hourly doses This dosage is continued for a week—that is, till the paroxysms are mild and broken up, and thereafter half this dosage is given for a further 7–10 days The drug was given in a gum emulsion syrup, and provided it was taken on an empty stomach vomiting seemed to cause little trouble

The mild course and short duration—or the complete absence—of the paroxysmal stage in 23 of the 25 cases tested can hardly be ascribed to chance In this series chloramphenicol, given early, has transformed an intractable and lengthy disease into a mild and almost insignificant ailment The details of our work will be published later

Pædiatric Department, Kasr-el Aini Faculty of Medicine, Cairo
A KHALIL
ZAHERA H ABDIN

EX-PATIENTS AS TUBERCULOSIS NURSES

SIR,—I would like to suggest that priority in admission to sanatoria should be given to those who are willing to undertake, when cured, to work as assistant nurses for a fixed period before returning to their normal occupations I imagine that a patient who has spent several months in bed acquires a useful familiarity with the simpler aspects of nursing In this way the patient would be encouraged to acknowledge his debt to society, and by repaying it would help to relieve the present shortage of sanatorium nurses This proposal to select patients on other than purely medical grounds may conflict with medical tradition, but its adoption would, I submit, shorten the waiting lists for admission

Department of Pathology Oldchurch Hospital Romford
E A ATKINSON

TRANSVESICAL PROSTATECTOMY

SIR,—I was most interested to read the article by Mr Crawford Stanley in your issue of Aug 5 describing his technique of transvesical prostatectomy, as I have been using a practically identical one in suitable cases of benign prostatic enlargement since May, 1946, and have now carried out this procedure on 79 patients I developed the operation as a modification of that described by Cannady in America about fifteen years ago, modifying it so as to achieve a one-stage technique, and was not aware that it was being performed elsewhere in this country

I also can bear witness to the excellent results obtained, which parallel those described by Mr Stanley The period of convalescence and the end results appear to be equally satisfactory to those obtained after the Millin procedure, whilst there is no doubt that it is very much simpler technically besides permitting the performance of any other associated intravesical operation

The youngest patient on whom the operation has been performed was 43 years of age and the oldest 84, the average age being 67 9 The average length of stay in hospital after operation has been just over 12 days in uncomplicated cases, and the patients appear to obtain complete urinary control—even at night—within the following 3 months Clot retention has been unknown, undoubtedly owing to the closure of the bladder over the prostatic cavity I have not been quite so unfortunate as Mr Stanley over the development of subsequent

epididymo orchitis, which has only occurred in just over 10% of cases, but I believe that this is probably due to the "tidal drainage" employed whilst the catheter is in position I believe that this complication is inevitably due to secondary infection during healing of the prostatic bed, and I attempt to control this by using continuous irrigation with 1 in 10,000 oxycyanide solution Only one case has developed post prostatectomy obstruction, and this was in a patient with secondary proteus infection which took a long time to subside

I agree with Mr Stanley that this operation has a definite place in prostatic surgery and that its success, as in all modern one stage procedures, is dependent upon the principles of closed bladder drainage and prevention of urinary infection

Leicester A DAVIS BEATTIE

ACQUIRED IDIOSYNCRASY TO SODIUM p-AMINOSALICYLATE

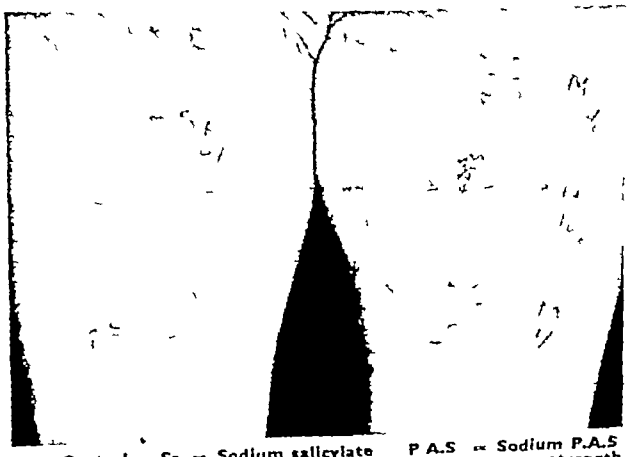
SIR,—In his interesting article of Aug 5, Dr James Cuthbert points out that published reports on severe toxic reactions to P A S are scanty His is the first I have seen in which a positive skin reaction has been obtained to a patch test done with sodium P A S One case has been reported in which a reaction to a patch test with aspirin was positive but that to P A S was negative [1]

The opportunity of investigating this phenomenon recently presented itself in the case of a woman, aged 25, in my wards in West Middlesex Hospital who developed pyrexia and an erythematous rash eighteen days after starting on a course of 1 g streptomycin and 18 g P A S daily The rash disappeared after stopping both drugs but recurred eleven days later when a single dose of sodium P A S was given by mistake Patch tests to various strengths from 5% upwards of sodium P A S showed a strongly positive reaction, and, in view of this, chemically pure sodium P A S, meta aminophenol, and sodium salicylate were procured and tests repeated with these drugs No reaction was obtained to control patches or to patches containing 20% salicylic acid or 20% streptomycin, but strongly positive reactions were obtained to 20% P A S and to solutions of meta aminophenol ranging from 1 to 20%

This patient was later desensitised with gradually increasing doses of sodium P.A S given under cover of 'Phenergan,' and it is interesting to note that the fading patch tests became itchy as soon as the dose was increased too rapidly When the patient was able to take 18 g daily the patch tests to 20% sodium P A S and meta aminophenol were repeated The former proved to be negative but the latter still produced a distinct reaction Control tests on other had been given sodium P A S proved qu It would seem, therefore, that in severe sh the sensitising agent is much more likel derivative of meta aminophenol than salicyl

HUGH
Ealing Physician to the C

1 Madigan D G, Griffiths L L Lynch M J G Bruce R A Kay S Brownlee, G *Lancet* 1950, i 239



C = Control Sa = Sodium salicylate P A.S = Sodium P.A.S
M = Meta-aminophenol The figures indicate percentage strength of the patches

SIR,—It was most interesting to read Dr C case record, for a reaction occurred in one of which was also characterised by symptom cold, prostration, pyrexia, glandular enla a rash

The patient was a man, aged 50, who suffered bilateral apical tuberculous infiltration which responded well to rest treatment P.A S 14 g commenced on April 11, 1950, but by April 24 he of having a cold in the head, and in the evening ture rose to 100 2°F The sensation of having a was followed by marked malaise and aching pains in and shoulders By April 29 his temperature reached and the lymph nodes in both posterior triangles of were slightly enlarged and tender On May 3 a fine rash appeared on the chest, abdomen, and forearms temperature, which had continued to rise in the reached 103 2°F P.A.S was discontinued and the fell by the next day, and remained normal thereafter rash cleared in twenty four hours, and the general malaise together with the enlargement of the cervical nodes subsided within the week following the I A S therapy No albuminuria was noted during of the reaction, and the Widal test was negative for group and *Brucella abortus*

On May 14, 14 g of P A S was given, and during the night the patient again felt that he had a head co complained of general malaise The temperature ros 98° to 98 4°F on the morning of May 15, and thereafter at a slightly higher average level than dur previous week On May 17 the feeling of malaise became aching pains were present in the legs, and the reached 99°F P A S was again discontinued, and by all symptoms had disappeared A scratch test done a drop of P A S on the skin gave no reaction As Cuthbert's patient, no vomiting or diarrhœa occurred al this man did have some nausea at the onset of his rea

No other patient taking the same stock solu P A S developed a reaction Davin and Rogers[1] 4 cases out of 85 in which a febrile reaction occ the temperature rising to 103–104°F and su promptly on withdrawing P A S

J B MORRISO
Abergele Sanatorium Medical Superinten

SIR,—The case reported by Dr Cuthbert has rem our last remaining doubts about the cause of a syndrome which affected a patient in this sanatoriu

Three weeks after admission, the patient, a single aged 23, started on a course of sodium P.A S, 20 g His condition remained satisfactory until the 26th day the course, when his temperature rose to 100°F and tinued to rise, reaching 104 6°F 2 days later (pul 132 per min) His only symptom was headache, wh unaccompanied by any other abnormal signs The P A S was discontinued, a total of 560 g having been but the temperature did not immediately return to as is usually the case in idiosyncrasy to this drug another 2 days, without any change in his condition junctival icterus was noted, and he complained for the time of nausea and anorexia Simultaneously a m macular rash appeared over the 'bathing drawer spreading in the course of the following week to cover whole body and cause much distress through it Jaundice deepened rapidly and persisted for 3 weeks beginning to fade The liver was never greatly enl and although palpable for a few days was not very The spleen was never palpated The temperature sud by lysis between the 10th and 15th day of the illness, patient's general condition continued to deteriorate repeated vomiting Intravenous saline-drip was given

1 Davin J R Rogers A E T *Amer Rev Tuberc* 19 611

developed oliguria and a raised blood urea a very distressing symptom The rash began ie 19th day and was followed by desquamation of al layers of skin On the 24th day the blood 8 mg per 100 ml following complete anuria for he patient was comatose and his legs œdematous ater his condition began gradually to improve, tually made a complete recovery

d Wassermann and Kahn tests were negative is was excluded by agglutination reactions, and ease by the Casoni test Homologous serum as considered because blood had been taken for sedimentation rate estimations before admission ites of these did not fit in with the length of tion period of this disease Epidemic infective vas regarded as improbable but could not be excluded The blood showed a polymorpho ocytosis (24 000 per c mm) and an eosinophilia of is suggested a toxic hepatitis with an allergic basis s supported by the presence of the rash Owing tremely severe illness we did not feel justified in out any sort of sensitivity test, but no drug other s had been taken up to the time when jaundice r and there now seems little doubt that this was the anthisan was given for a few days, but did not seem the course of the illness The allergic nature of the is not realised in the early stages when anti histamine ght have been of service—we have in fact found that with milder skin reactions due to P.A S sensitivity e usually effective Once the jaundice appeared we uggest that the stage of allergy had been passed and r cells had suffered some irreversible damage The had no previous history of allergy

blood P.A.S levels were estimated at weekly intervals the time the patient was taking the drug, the figures 11 mg , 6 7 mg 12 mg , and 11 4 mg per 100 ml , the gure being for the first day of the illness Although igures are above the average for patients taking this of P.A.S , we have had many patients with even blood levels who have not had any sort of toxic n.

e P A.S is now probably the most widely used drug treatment of tuberculosis, it is important that such gerous form of toxicity should be recognised in of its apparent rarity

R LIVINGSTONE
am Sanatorium Kent E W STREFT

DIMERCAPROL IN LEAD POISONING

,—In your issue of July 29 (p 171) Dr Bastrup en describes two cases of acute lead poisoning d with dimercaprol (BAL), which showed an ised excretion of lead in the urine during treat

One cannot subscribe to the conclusions which aws—that "Dimercaprol must be regarded as a ial and effective means of increasing the excretion d in acute lead poisoning"

the first place the lead BAL complex, unlike those d by mercury and arsenic, is not non toxic but, ding to Gurmuth and Eagle[1] is twice as toxic as In the second place BAL does not produce any ciable deleading For example, in mice I have [2] that, when lead was administered in the food for o ten days, subsequent treatment with dimercaprol 3 the recovery period of one to two weeks had no cant effect on the final lead content of the animals e and his collaborators[3] while reporting a transient se in the urinary excretion of lead in men treated BAL, state that they have been unable consistently orten the clinical course of lead intoxication or to ain a significantly increased rate of elimination of by giving repeated doses of BAL

ally the toxicity of the drug itself must be borne in On the present evidence—and there is much more than I can give in this letter—there appears to be no indication for the use of dimercaprol in lead poisoning

Department of Pathology
North Middlesex Hospital
London N 18
A B ANDERSON

muth F G Eagle H *J Pharmacol* 1948 92 397
lerson A. B *Brit J Pharmacol* 1949 4 348
ler H W Cholak, J Kehoe R A *Science* 1947 106

PUERPERAL URÆMIA DUE TO ACUTE UPPER-NEPHRON NEPHROSIS

SIR,—So long as Dr Govan and Dr MacGillivray (July 22) treat cases of puerperal anuria with sucrose[1 2] they will continue to see the hydropic changes in the first convoluted tubules to which they attach such significance

Postgraduate Medical
School of London W 12
G M BULL
BERNARD LENNOX

TOBACCO AND LUNG CANCER

SIR,—One might add the petrol lighter to your list of possible causes of the suspected increase of cancer of the lung (p 257 last week) Judging by advertisements in the *Illustrated London News* and other journals, the cigarette lighter became popular about the time of the 1914–18 war—a chronological coincidence sufficiently close to be suggestive

There is some comfort in the thought I find it easier to use matches than to give up smoking

Ipswich R M MAYON WHITE

Obituary

HENRY CUTHBERT BAZETT

C B E M C , M A , D M OXFD, D SC WEST ONTARIO, F R C S

NEWS of the death of Dr Bazett on July 12 on his way to England to attend the meeting of the Physiological Society at Oxford came as a shock to many who attended the meeting Two colleagues, one from each side of the Atlantic, who feel that "something more is needed than recitals of degrees positions held, and honours to mark the passing of such a man" have sent us the following tributes

* * *

Two outstanding characteristics impressed themselves on the graduate students scientific collaborators and university colleagues who knew and respected Bazett as man and scientist The first was a dominating, generous enthusiasm Bazett, when telling of, or listening to, an account of experiments that gave a glimpse of new scientific truth or suggested new ideas in physiology was like a small boy given a bicycle Age did nothing to diminish this ebullition of enthusiasm, and it was unspoiled by any worldly taint of personal ambition or the jealousy that so easily besets even the scientist I have so often seen Bazett at federation meetings, not hobnobbing with the important people but spending his time in discussion with some young student who had, he felt, done honest work and had ideas that should be encouraged The same enthusiasm made him a great teacher of the medical undergraduate, though his lectures were apt to be complicated in detail and perhaps sometimes too advanced for their immediate comprehension Every student felt that, after all, physiology must be really important and exciting if this man was so enthused How often Bazett must have been late home to dinner because he had lost all sense of time explaining patiently to some student the answer to a question which had revealed a genuine interest and intelligence Surely the essence of great teaching is this power to infect the student with enthusiasm, rather than the highly organised lucidity that is so much admired

Another of H C B 's enthusiasms was swimming (and of late years painting) No matter how cold the water or how unattractive, to the rest of us, the opportunity, he was impelled to dive into any pool, stream, or

1 Bell E T Renal Diseases London 1946 pp 21 259
2 Helmholz H F *J Pediat* 1933 3 144

ocean available He belonged to a club near his home where there was a deep cylindrical tank converted to a pool Dr Bazett would challenge all to dive to the greatest depth, and I never knew him outshone by his much younger rivals Again, in the undergraduate teaching laboratory, Dr Bazett would compete with students in breath holding experiments, and seldom if ever be beaten To see him urging on a student in a voluntary hyperpnœa was never to be forgotten He made physical recreation an opportunity for acute physiological observation, and physiological observation was to him a recreation

The same enthusiasm of Dr Bazett included, as well as physiology, all things connected with the welfare of science in general He was a leader in any movement to safeguard the liberties of scientists, and after the war organised help to fellow scientists in Europe and Asia by sending them journals, reprints, and apparatus And though he served the country of his adoption so well, he always leapt to the service of Britain and the Commonwealth In 1940, when the United States was not yet at the war he begged leave of absence from the University of Pennsylvania to come and take part in aviation medical research then starting in Canada The growing claims of his responsibilities in the United States made him return but when six months later the death of Sir Frederick Banting left the Canadian civilian research effort in this field without a leader, Dr Bazett hastened to our aid once more and took over direction This was at a considerable financial and personal sacrifice Later in the war he served the whole Allied war effort by journeys, including those to India and Burma, for consultation and research with the R A F and the R N

A second outstanding characteristic of the man was his great moral and physical courage This is attested not only by his record in the first world war, but by the many heroic and even dangerous experiments in human physiology in which he loved to be the pioneer He was always himself the first subject of an experiment and often performed operations upon himself of which few of us would be capable As he grew older, this was a source of considerable worry to his friends, but he could not be dissuaded when he felt that fundamental scientific information could be gained no other way When he was engaged in the early investigations of the effect of G, he would visit various R C A F stations and ask in the mess who was the best and most daring of stunt pilots Then he would persuade this man to take him up and see how soon he could make him black-out So alarmed did Dr Bazett's friends in administrative posts become, that confidential orders were sent to the stations that this man was not to fly in such stunts, as he was too valuable to lose in such a way I do not know whether he ever discovered this, if so he would have been infuriated I have been in many an altitude chamber experiment with him in the early days of the war He would suffer the acute and very painful type of aeroembolism, his colleague nothing but mild rheumatic distress Yet it was Dr Bazett always who insisted on going up again after a few minutes of descent It may well be that he gave part of his life span for science by the type of heroic physiological experiments he made

The memory that so many will carry of Dr Bazett from seeing him in discussion at meetings will be that of a delightful kind of pugnacity He was like a terrier after a rat, when he was on the trail of scientific truth Again, to continue the simile, he never ceased to attack the bone of a fact until he had cracked it open and extracted the marrow of truth And he had the rare gift of criticism without giving offence, but rather encouragement He was generous with his advice, interest, and time To hundreds of us he must have been a great friend as well as a great physiologist We will not soon forget him The impress of his life upon us was deep, and many of us will model our researches our teaching, and our conduct upon his A C B

Bazett was this year elected president of the American Physiological Society, a remarkable honour for a man who retained his British citizenship, but an arduous post, especially for a man of his enthusiasm and vitality. The outstanding work carried out in his department at Philadelphia was accomplished with the minimum of elaborate equipment In spite of the austerity of his laboratory, there was always an eager graduates working there, inspired by his subject, and delighted by his endearing and sense of humour

His contributions to physiology were m his greatest interest was in temperatu the control of the circulation The main work was carried out on human subjects, employed in most experiments was H C was once suggested to him that he should with the title *The Physiology of H C Bazett* an astonishing disregard for himself in his but they were never undertaken in any of self-sacrifice He had such a remar curiosity he just had to find out, and if the involved considerable discomfort for himself, that matter? His experiments were beautiful human physiology is singularly full of pitfalls unwary, but Bazett showed that exact work on on man as well as, if not better than, work on or dog

It is not surprising that his services were demand during the war His work in Canada Banting Institute and then in the United effort was outstanding, and once more the ability to work with a team of investigators produce work of fundamental importance when with ad-hoc problems

After the war, Bazett and his colleagues more exact techniques for studying the temperature in circulating blood They showed importance of venæ comites in the control of temperature, arterial blood in the limbs cool it is by a venous plexus can be precooled by the venous blood, so a temperature gradient can length of the limbs This has proved a fruitful in explaining some of the peculiarities of the in the limbs and has also helped to explain paradoxical changes in rectal temperature

His loss is a sad one for his colleagues in Canada, and in Britain, and he will be particularly at Copenhagen, where he was expected at the Intern Congress on Physiology Those who worked same field will miss his advice, which was widely and freely given His papers and contributions books and symposia will continue to be many years

Dr Bazett, who had held the chair of physiolog University of Pennsylvania since 1921, was born the son of Dr Henry Bazett of Gravesend educated at Dover College, Wadham College and St Thomas's Hospital He qualified in after holding house appointments and a demo ship in physiology at St Thomas's he was Radcliffe travelling fellowship in 1912 which en to spend a postgraduate year at Harvard U He returned to this country shortly before the war, during which he served with the R A M C For his services he received the M C and was thr mentioned in despatches and on his demobili was also appointed O.B.E From 1919 till up his appointment in Philadelphia Dr Ba Christopher Welch lecturer in clinical phys Oxford He was appointed C.B.E in 1946 research work in the late war

In 1917 Dr Bazett married Miss Dorothy L survives him with a son and a daughter

GEORGE RAPHAEL BUICK PURCE

M C, M CH BELF F R C S E

THE eldest son of the late James Purce of Ra co Antrim Mr G R B Purce was educated at C Academic Institution and Queen's University, where he had a brilliant career, qualifying with in 1914 During the 1914–18 war he served with 8th battalion of the Royal Irish Rifles, and he awarded the Military Cross After he was dem he took the M CH in 1920 and the F R C S E the foll year He quickly won recognition as a surgeon was appointed to the staff of the Royal Victoria H Belfast the Ulster Volunteer Force Hospital, a Ulster Hospital for Children and Women He was

surgeon to the Forster Green Hospital and ev Sanatorium He was consulting surgeon to er hospitals in the province

3 writes "Purce's surgical career is a story it pioneer work not only in thoracic surgery, him in 1948 to the presidency of the Association ic Surgeons of Great Britain and Ireland, but urosurgery in which for many years he did the are of the work in Ulster All this was in addition idest range of general surgery and involved a of work which only a man of his exceptional powers could have achieved Despite this he to maintain the keenest interest in a wide subjects and was always increasing his already owledge From playing hockey for Ireland as man his interest in sport was maintained all He was a first-class shot with either rifle or , and a keen golfer and fisherman and when his in navigation was stimulated by a yacht-holiday, it was typical of him that he was not till he had mastered the mathematics and l details of this anything but simple subject.

a teacher his great store of knowledge and lexperience was available for the asking to all those e enough to work with him but his own distaste form of parade or showmanship prevented him preading much valuable knowledge as widely as would have wished. He was too busy doing his o be talking about it unasked and when in dis- of surgical problems his advice was sought he d himself simply and helpfully to the point where nen might have been drawn into a demonstration ir knowledge His surgical skill and judgment ed almost uncanny, but he was never one to in spot diagnosis, and his decisions, though wiftly made were the logical and carefully weighed of his great experience In operating no con- ions of surgical difficulty or personal fatigue were llowed to cloud the main issue of what was the procedure for the patient s ultimate welfare and this completely selfless attitude to his work that ay owe their lives and health His position as a n can never be in dispute but it is even more great qualities as a man and a friend that Barney will always be remembered by those who knew orked with him"

ERNEST THOMAS JENSEN

M.B LOND

Ernest Jensen who died in London on July 31 age of 76, will be best remembered for his work irman of the Institute for the Scientific Study of quency But his posts and activities were many ualified from Guy s Hospital in 1901, and in his days he was a civil surgeon to the Herbert Hospital, wich. He also served with the field force in the war, and later he joined an expedition into unknown of British East Africa A fellow of the Royal y of Tropical Medicine and Hygiene he was the er of the Tropical Disease Prevention Association e was also an original member of the Society for the of Radiesthesia

Grace Pailthorpe writes ' In 1931 when I was is to start an association for the scientific treatment nquency, Dr Jensen became a co-founder with me it is now known as the I S T D and he was its an from its inception until his death He gave usly in time and money towards the institute r years he housed it in his home until in 1937, financially strong enough to move to its own in Portman Street This period was shorthived ly in the late war the house was bombed Once Dr Jensen came to the rescue and he spent himself ingly until he had found a new home for the) at 8 Bourdon Place, Mayfair

ring the war he often attended to street casualties one occasion he himself received slight wounds lving splinters Dr Jensen was much beloved patients, medical colleagues and friends His and his power to give of his time without stint, ess of his own gain, endeared him to all who knew He was of that old régime that, regrettably, has most ceased to exist He lived to serve'

MARGARET RANKEN

M.B DURH

Dr Margaret Ranken of Sunderland and Newcastle, died on Aug 7 after a short illness

Miss Ranken qualified M.B from the University of Durham in 1924 and after various resident appointments specialised in ophthalmology as her life's work She had been associated with the eye department of the Royal Victoria Infirmary, Newcastle upon Tyne, for almost twenty-five years as house-surgeon, refractionist, registrar and associate surgeon Since its inception Miss Ranken had been surgeon-in-charge of the orthoptic department at Sunderland Eye Infirmary, which is the orthoptic teaching school of the region, turning out a steady flow of qualified orthoptists In 1943 she was appointed ophthalmic surgeon to Durham County Hospital where she was in charge of the eye department until 1946 when she was appointed ophthalmic surgeon to the Ingham Infirmary, South Shields

J S A writes 'Miss Ranken's great interest was in the treatment of squints, on which she was a recognised authority, and she elected to operate while the patient was still very young Her success in this field of ophthalmology was due to her surgical skill. her unlimited patience, and her fondness for children with whom she was able to develop an extraordinary degree of confidence and friendship Miss Ranken had an entirely altruistic outlook on life, and if she could do a good turn to anyone she did so without counting the cost to herself She was concerned with the benefits which she in her profession could convey to humanity rather than in any personal gain

"Among her general interests, Miss Ranken was a member of the Central Orthoptic Board an active member of the Medical Women's Federation, and past-president of the Sunderland branch of the Soroptomists, of which she was secretary for many years By Miss Ranken's death the community has lost a modest and well loved doctor, and the profession a skilful and dependable ophthalmic surgeon and a colleague who will be difficult to replace"

Births, Marriages, and Deaths

BIRTHS

ARCHIBALD —On Aug 8 the wife of Dr J R Archibald—a daughter

ARMSTRONG —On Aug 6 at Oxford, the wife of Dr W B Armstrong—a son.

BAKER.—On Aug 9 at Wednesbury Staffs Dr Hazel Baker (née Hill) wife of Mr J A C Baker M.A —a son

BATTLE.—On Aug 3 in London the wife of Mr Richard Battle F.R.C.S —a son

BRIMBLECOMBE —On July 31 in London the wife of Dr Frederic Brimblecombe—a son

BURGESS —On Aug 6 the wife of Dr George Burgess—a daughter

BURROW —On Aug 2 at Canterbury the wife of Mr K. C Burrow M.B.E F.R.C.S.E —a daughter

COPLANS —On Aug 3 at Nowra New South Wales the wife of Surgeon Commander R. M. Coplans, R.A.N —a daughter

DENTON —On Aug 2 in London the wife of Dr Mervyn Denton—a daughter

EDWARDS.—On July 31 in London, Dr Joan M. B Edwards, wife of Dr David A W Edwards—a son

HOLLMAN —On July 31 in London the wife of Dr Arthur Hollman —a daughter

HOUSE.—On Aug 3 at Tewkesbury the wife of Dr Robert House—a daughter

LAW —On Aug 9 in Manchester the wife of Dr J S Law—a son.

LE VAY —On Aug 8 in London Dr Marjorie Le Vay (née Cole) the wife of Mr David Le Vay F.R.C.S.—a son

LUCY —On Aug. 5 the wife of Dr J D Lucy—a daughter

RIVLIN —On Aug 4 in London the wife of Dr Stanley Rivlin—a daughter

RYCROFT —On Aug 4 the wife of Dr Charles Rycroft—a son.

SEATON —On Aug 10 in London the wife of Dr D N Seaton—a son

SMILLIE.—On July 25 in Sheffield, the wife of Dr T G Smillie—a son

WHITEHEAD —On Aug 4 at Downton, Wilts the wife of Dr B L Whitehead—a daughter

WHITWORTH —On July 31, in Iowa City U.S.A. the wife of Dr Rex Whitworth—a daughter

MARRIAGES

FORBES—BURBERY —On Aug 5 at Newton Abbot John Ronald Forbes M.D to Pamela Stone Burbery S.R.N

HARRISON—GUILLEBAUD —On Aug 9 at Gerrards Cross Thomas Alan Harrison M.B., to Jean Margaret Guillebaud

DEATHS

BRAND —On Aug 7 at St Andrews William Gillon Brand, M.B. Edin

MORRIS —On Aug 3 at Lew Down, Devon Henry Gibbins Morris M.R.C.S

Notes and News

ODD FEET

THE difficulties encountered by those whose feet are of different sizes have been discussed in our columns already [1] One firm of shoemakers have taken a conscientious interest in the problem, and are willing to help Messrs Charles H Baber Ltd have a long tradition of coöperation with doctors and others interested in sound and comfortable feet, and they are willing to supply those who need them with shoes in two sizes Their method of fitting is good, taking account of both the length and width of the foot A patient who has experienced great difficulty in getting even tolerable foot gear tells us that shoes made by this firm in sizes fitted for each foot separately are thoroughly comfortable, and that as far as she is concerned her problem is solved Messrs Baber warn us that though they will do their best to meet orders, they are very short of skilled labour and can undertake only a small amount of such work Those who need odd shoes, however, know that a comfortable pair are worth waiting for We congratulate Messrs Baber on their public spirit at a time when labour and materials for the home market are scarce

University of Oxford

On July 29, the following degrees were conferred

D M—R T C Pratt

Ch M—P A L Roberts

B M—W G Dewhurst W F P Gammie Henry Yellowlees J L Godden J M D Hooper R S Walsh, Lawrence Robertson J G Danaher B N McQuade, R A Riseley Prichard J H Wilson C S Pitcher P H Watkins I B F Kampfner G E Rousseaux, Ursula F Rowlatt Myrtle J Raynor

University of London

Dr Frederick Murgatroyd has been appointed to the Wellcome chair of clinical tropical medicine at the London School of Hygiene and Tropical Medicine from Oct 1

Dr Murgatroyd graduated M B with honours in the University of Liverpool in 1926 The following year he joined the staff of the Liverpool School of Tropical Medicine as assistant lecturer in protozoology and later he was appointed clinical pathologist to the school and to the department of tropical diseases at the Liverpool Royal Infirmary In 1934 he became lecturer in tropical medicine at the school and honorary assistant physician for tropical diseases at the Royal Infirmary With Warrington Yorke he carried out a series of investigations on the mode of action of drugs in cases of sleeping sickness, and in 1936 with a senior Medical Research Council fellowship he spent some time in West Africa continuing this work in the field In 1937 he was appointed to the staff of the London Hospital for Tropical Diseases Later he also became physician to the Albert Dock Hospital and the Dreadnought Hospital Greenwich He is consultant physician to the Colonial Office and deputy director of the clinical division of the London School of Hygiene and Tropical Medicine He is a member of the typhus diagnosis panel of the Ministry of Health During the late war Dr Murgatroyd with the rank of honorary lieut-colonel R A M C served as assistant director of pathology to our military forces in West Africa He was elected F R C P in 1940

Dr S D Elek has been appointed to the readership in bacteriology at St George's Hospital Medical School from Oct 1, and Dr Bernhard Katz has been appointed to the readership in physiology at University College from Oct 1

Supplies of Chloramphenicol

The Economic Co operation (Marshall Plan) Administration have signed a contract with Messrs Parke, Davis & Co, the American pharmaceutical manufacturers, guaranteeing convertibility into dollars of possible returns on the company's investment of $420 000 for the erection of a new plant at Hounslow, Middlesex The plant will produce pharmaceuticals with emphasis on the production of 'Chloromycetin' The project is expected to increase the present inadequate domestic supply of chloromycetin without using dollars and to make possible British exports to Europe, South Africa and the Near East

Artificial Arm Controlled by Toes

An artificial arm controlled by the toes and powered by a 1/6 horse power battery-driven motor has been developed in the U S A According to a B U P report, control is exercised through two small pneumatic bladders under the patient's big and little toes By toe pressures the patient can in unbroken sequence move the fingers and thumb flex or extend the wrist, rotate the hand in either direction and flex or extend the elbow It is claimed that armless people even those without stumps, can answer telephones write, type unlock a door light cigarettes squeeze out toothpaste, or throw a dart

1 *Lancet* 1950 I 455 517

Royal College of Obstetricians and G

At a meeting of the council held on July 22, the officers were re elected President, Prof Hilda vice presidents, Mr J E Stacey, Mr V B Green hon treasurer, Mr Arthur Gemmell, hon secretary H G E Arthuro, hon librarian, Mr F W Rogers curator of the museum, Mr Aleck Bourne

The following were elected to the membership

G T Altimas, J D Andrew P R Blaney, G T Cross Champ, F L Clark T R Clarke W W Coppinger R M F D Crichton, C N Degaris William Donovan R F Isabel L Dyke M W Elliott C J Farr Balqis Fahmi Foote, M B Fox H H Francis A C Gardner Frost W F C A Haxton H A Henderson H F Hills Robert R H Horner D R Hughes T G Ingram D J Kel H A Kelsey, Devaki Kutty J F Leaver J L Macarthur McEwen K T MacFarlane, Isabel M Macrae C. Mills W Douglas Marshall G B Maughan, A C Naylor Helen R H O Hanlon Doddana Croud Prakashi Paranjothy Pearson, Eby Quehl, G J Quigley, Prins Dana nam Indira Ramamurthi, D H Rea K F E Read R A A M Rutherford D R Sheumack, J M Slattery D W Sparling Subodh Kumar Sur Roy L G R Van D B Beckwith Whitehouse Joel Wilbush E A Williams Young

Faculty of Ophthalmologists

The Ministry of Health have given directions to hospital boards that school clinics held at hospitals be run by ophthalmic opticians who should refer cases they think fit to an ophthalmic surgeon who should nominally in charge The faculty's views have been before such a clinic is formed in the London County area, and at a meeting on June 30 the council of the decided that the Ministry's direction is undesirable drew the attention of the chief medical officer of the to a memorandum on an Ideal School Ophthalmic prepared by the ophthalmic group committee of the Medical Association in May, 1948

British Journal of Tuberculosis and Diseases of Chest

Dr Philip Ellman is succeeding Dr Clifford Hoyle editorship of this journal, after the publication of the issue He will be assisted by an editorial board which addition to Dr Hoyle comprises Mr T Holmes (London), Dr A Brian Taylor (Birmingham) and Charles Cameron (Edinburgh)

Premature Baby Unit

A unit for 14 premature babies is to be opened on Oct the Obstetric Hospital at University College Hospital consists of 2 nurseries, each of 6 cots, one of which is heated and provided with piped oxygen In addition is an isolation nursery of 2 cots About half of this accommodation will be for babies born outside the hospital weighing under 5 lb who need special care which cannot provided at home can be admitted by arrangement with children's house physician at University College H (Euston 5050) It is desirable to admit them as soon after birth as possible One of the unit's staff will collect the by ambulance at any time of the day or night, from anywhere in the London area

CORRIGENDUM *Protection of the Skin from Sunburn* regret that in some copies of last week's issue, fig 3 of paper by Dr Russell and Dr Anderson was printed down In the legend to fig 2, absorption spectra referred to base "A," and X and Y to base "B"

Appointments

AGERHOLM CHRISTENSEN, J M D Copenhagen orthopaedic Wingfield Morris Orthopaedic Hospital and associated and clinics

DAVIES, J B M M D Lond D P H deputy M O H and school M O Oxford

EUSTACE ANTHONY M B N U I D P H county M O H Ireland

GREENBURY C L M D Lond pathologist hospitals in Aylesbury High Wycombe area

HARRIS H J M B Lond pathologist hospitals in Aylesbury Wycombe area

O GORMAN G M R C I D P M physician superintendent court Institution for Defectives Poppard Oxon

REEVES ANTHONY M D Dubl D P H county M O Ireland

ROBINSON H D H M R C S D P H asst county M O H and M O H Essex

TATTERSALL, W H M A M D Camb consulting chest phy Bournemouth area of the South West Metropolitan hospital board

UNGLEY H G V R D, M D Durh F R C S consultant Lambeth Hospital London

MEDICAL SYMPATHECTOMY" IN HYPERTENSION

NICAL STUDY OF METHONIUM COMPOUNDS

RICHARD TURNER
O B.E, M.A, M.D Camb F R C.P
SICIAN, WESTERN GENERAL HOSPITAL, EDINBURGH
LECTURER IN MEDICINE UNIVERSITY OF EDINBURGH

E the hexamethonium and pentamethonium unds block the transmission of nerve impulses gh autonomic ganglia, their potential range of ness is wide This preliminary paper is concerned their possible use in essential hypertension in order oduce effects comparable to those of surgical athectomy No attempt can yet be made to assess esults of treatment, but as others may be con- ng a trial of these compounds it was suggested that rt account of the experience gained during the past onths would be of interest

mpathectomy is an unscientific method of dealing hypertension one cannot even foretell whether it lower the blood-pressure at all or for a reasonable d Admittedly medical sympathectomy is equally ientific, but it is a gentler procedure and would be erable if equally effective Whether it is always able to reduce the pressure in patients with marked rtension is a separate question A high pressure is ably but one manifestation of hypertensive disease, not necessarily the most important But so long as pathogenesis remains unknown, all treatment must empirical, and at present it is mainly directed at cing the pressure.

o the anæsthetists who first used pentamethonium hexamethonium compounds to counter the effects lecamethonium compounds, the lowering of blood- cure which they produced was a troublesome or dangerous side-effect But this action was naturally particular interest to physicians

THE COMPOUNDS AND THEIR ACTION

tricti- speaking the term "medical sympathectomy" s not correctly describe the action of pentamethonium l hexamethonium, which is not confined to one part the autonomic nervous system But for practical poses this is their main effect

heir chemical and pharmacological properties have been y described by Paton and Zaimis (1948 a and b 1949), low and Ing (1948 a and b) and Balaban et al. (1949) ay and Smith (1950) found hexamethonium iodide LL) an effective and innocuous means of reducing gastric ction and motility in patients with peptic ulceration tunes it may prove a useful means of treatment Little t on the blood pressure was observed in patients with nal tension.

mold and Rosenheim (1949) investigated the effect of amethonium iodide (P.M.I.) in normal and hypertensive ons They gave it by intravenous, or sometimes intra cular injection and demonstrated that the vasodilator on was similar to that of tetraethylammonium (T.E.A) stronger and of longer duration. They concluded t postural hypotension was likely to limit its value in tment and that its most promising application was to pheral vascular disease Later with Goetz they reported his peripheral vasodilator action (Arnold et al 1949) ur and Graham (1950) made detailed studies on the t of H.M.I. and P.M.I. on the blood pressure peripheral lation, and sweating in normal, vasospastic and hyper ive subjects and likewise concluded that postural otension was likely to limit their employment

hen penta- (or hexa-) methonium iodide (or bromide) ven by intravenous injection to hypertensive patients blood pressure usually falls precipitately This on is almost immediate but short-lived Hence the onse is of little value except as evidence that the d pressure is in 100 mg is usually well tolerated without appreciable side effects, but 50 mg will serve to demonstrate whether the preparation is effective in the particular person A typical response is shown in fig 1 and compared with an injection of tetraethylammonium bromide (T E A.B) in the same patient

On intramuscular injection of the compounds the fall in systolic and diastolic pressures begins within fifteen minutes, and is usually as great as that produced by an intravenous injection, but the pressure thereafter rises more slowly, and (with the patient recumbent) the previous level is not reached for three or four hours or longer This being the customary effect, we soon found that intravenous injections could be dispensed with altogether The next step was to try to maintain the blood pressure at a reasonable level throughout the day (There is no need to maintain a continuous state of response to these drugs throughout the 24 hours, for it can be demonstrated that a blood pressure which is labile and falls, for example, in the amylobarbitone ('Sodium amytal') sedation test, will fall to a similar low level during sleep) For this purpose 100 mg three times a day was found to be a suitable average dose to give in the first place The injections should be spaced so that the next is given just as the pressure begins to rise again

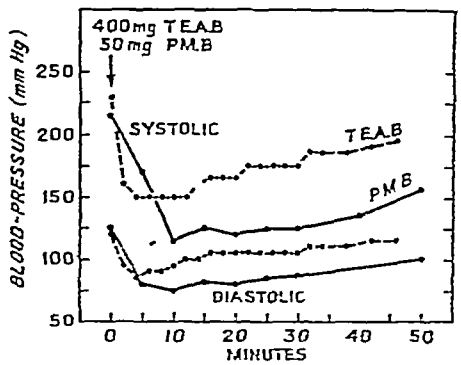


Fig 1—Comparison of effect of T.E.A.B (400 mg) and pentamethonium bromide (50 mg) given intravenously to the same patient (lying)

Having ascertained the effect of regular injections with the patient in bed, a similar trial should be made with him up and about Under the influence of these drugs, the blood-pressure is much affected by posture, and injections must at first be given with the patient under close observation for fear of excessive hypotension. There is little risk of a faint when walking about the danger is in standing still. For example, a patient was quite all right when walking from hospital to the bus-stop, but trouble came when he was standing in the queue Symptoms related to postural hypotension can largely be obviated by wearing an abdominal belt or binder, as is done after surgical sympathectomy, and patients should be advised to contract the abdominal muscles at the earliest indication of faintness, or if possible to lie down This particular difficulty can usually be overcome in practice

Assuming that a permanent state of lowered pressure produced by these preparations is desirable for hypertensive patients the next question was whether regular doses by mouth during the day would produce this result without undesirable side-effects An average dose to begin with was 1 g in solution three times a day, and if this proved insufficient the amount was gradually increased It became clear that in cases where the blood pressure could be lowered by giving the drug by injection it could also be lowered by giving a larger dose by mouth In most patients with hypertension this has been found possible, but it is not at all easy to establish a fixed daily dose for any particular person Even when the drug is given by injection its action seems to vary and sometimes to be cumulative Postural hypotension likewise varies and consequently it is

difficult to maintain a fairly steady level for anyone leading a reasonably active life, even when wearing an abdominal belt or binder When these drugs are given, the pressure varies widely with rest and relaxation, walking, sitting, standing, and emotion Perhaps because of varying absorpton or metabolism, the variation is greater when the drug is taken by mouth Though these difficulties may be overcome by perseverance they indicate the need for special care in administration to outpatients

ASSESSING THE EFFECT

The assessment of drugs like this is not at all easy First, it is essential to establish the normal levels of blood pressure throughout the day, both lying and standing In hypertensive patients especially, the level varies considerably from hour to hour and day to day, and this means that any lowering of pressure must be considerable and consistent before significance is attached to it Naturally pressures must be taken with the same technique, and they should be taken on the same arm If possible they should be taken by the same person The pressure usually settles a good deal in the first few days after admission to hospital, and it is best to complete the other investigations, such as electrocardiography, radiography, and estimation of renal function, before attempting to ascertain the basal levels Also one must try to determine which symptoms are really related to the hypertension Symptomatic relief is by no means a reliable guide to prognosis objective evidence is better

ILLUSTRATIVE CASE HISTORIES

Some of the difficulties are evident from the following case histories

Case 1 —Mr A, aged 46, was a stable married man referred because of headaches, dizziness, and increasing shortness of breath on exertion over the past two years Casual B P readings were usually about 230–240/130–150 There had been no suggestion of ischæmic pain. General condition good though rather overweight No signs of cardiac failure Normal rhythm Apex beat not displaced but somewhat heaving No triple rhythm but wide splitting of the first heart sound at the apex (confirmed by phonocardiography) Accentuation of aortic second sound No murmurs Lungs clear Fundi showed no papilloedema, hæmorrhages, or exudates, but there were grade II hypertensive changes in the retinal vessels (Wagner and Keith 1939, Keith et al 1939) Screening showed some hypertrophy of the left ventricle but no pulmonary congestion. E C G s (14 leads) were compatible with moderate left ventricular hypertrophy but revealed no evidence of infarction Renal function slight impairment Other systems normal

The hypertension was shown to be labile Casual readings fell somewhat with rest and relaxation in hospital to 220/110 The B.P fell with amylobarbitone narcosis to 150/100 and with T.E A B (0·5 g intravenously) to 130/70 Following 40 mg of pentamethonium iodide (P.M I) intravenously, it fell to 115/70 The effect of a single intramuscular injection of H M B is shown in fig 2 the diastolic pressure remained under 100 for about six hours The effect of two injections of hexamethonium bromide (H M B) is shown in fig 3 and that of three injections of hexamethonium bromide (H M B) in fig 4 Similar results were obtained on other days Side reactions varied widely Sometimes he felt rather weak and sick during the day and at other times there were no unpleasant effects

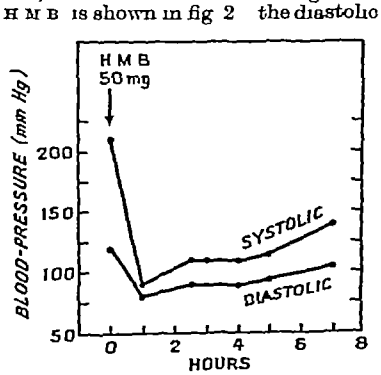


Fig 2 (Case 1)—Effect of a single intramuscular injection of hexamethonium bromide (lying)

Observations were made with varying postures—i e, lying flat with the foot end of the bed raised on blocks, and then with the head end (about 18 in) These manœuvres had little effect on the (Subsequent observations showed that raising or ' end of the bed is insufficient for assessing the effe posture, the patient should sit up or, if necessary, stand

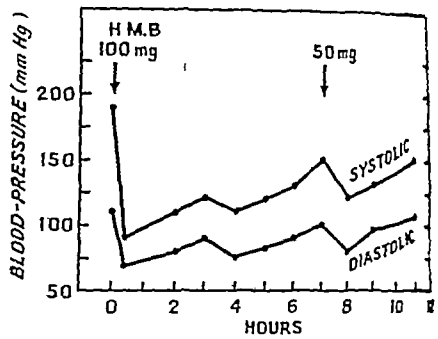


Fig 3 (Case 1)—Effect of two intramuscular injections of methonium bromide in the day (lying)

It was apparent that two to three intramuscular injec a day would maintain a B P more or less within the n range and without undue side-effects A dose of 0·5 by mouth produced no appreciable fall in pressure, and was little effect from a further 1 g taken three hours lat Next day 2 g was taken as an initial dose, but five hours later the pressure was still 200/120 Consequently a further 5 g was given This may have been somewhat premature and over generous, at all events there was a good fall of pressure which was 140/90 after three hours and remained about this level until he went to bed at 10 P.M He complained of feeling squeamish and rather faint when he took a bath after tea, and his standing pressure at this time was found to be 95/65 On waking next morning it was 145/95, and throughout the day he felt nauseated and was troubled by diarrhœa On the following morning this had passed and he felt well again On other occasions with smaller and better spaced dosage (e g, 1 5 g t d.s) comparable results were obtained However, he never really felt well in himself on this régime, though quite free from his previous symptoms

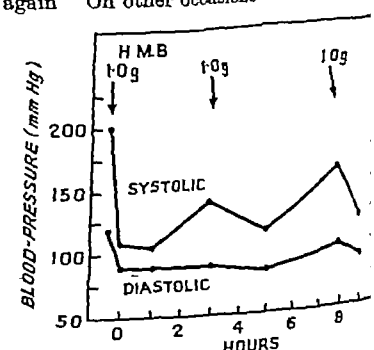


Fig 4 (Case 1)—Effect of three intramuscular injections of hexamethonium bromide in the day (lying)

No matter how much care is taken to avoid introspection, frequent estimations of the B P may produce *anxiety in hypertensive patients* During the period observation he became free from symptoms but it was that continued attempts at "medical sympathectomy" were unwarranted, and surgical sympathectomy was advised and accepted There was an unfortunate sequel in that died from pulmonary embolism

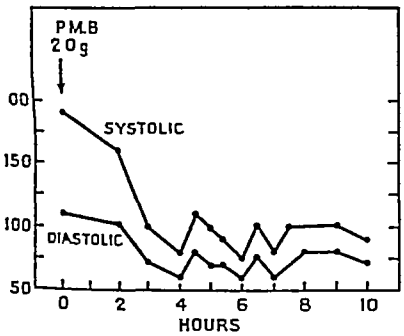
Case 2 —Mrs B, aged 51, was a woman of worrying disposition in whom hypertension had been discovered three years previously She had been troubled with headaches for many years and after a particularly bad spell, accompanied by sparks and lights flashing in her right eye, she awoke one morning to find her left eye completely blind Six months later she had another period of severe headaches with considerable epistaxis Eight months after this she noticed sharp right-sided paroxysmal headaches accompanied by flashes in front of the eye These features persisted and reminded her of the events on the previous occasion so that she feared losing the sight of this eye too It was for this reason that she sought advice

Thin but general condition good Casual B.P reading 200–240/110–120 No signs of cardiac failure, normal rhythm and pulse wave —No clinical enlargement of heart normal sounds and no murmurs Fundi showed

atrophy, right disc normal, grade I hypertensive changes only Urine trace of albumin, no cells casts but definite evidence of impaired renal function Specific gravity 1016 blood urea 50 mg per 100 ml, urea-clearance 25% of average normal function Intravenous pyelograms normal Screening of the heart showed no general enlargement slight rounding of the left ventricle, slight unfolding of aortic arch, no hilar congestion E C G s showed slight changes compatible with left ventricular hypertrophy

With amylobarbitone narcosis the B P fell from 240/120 to 150/90 and with T E.A B (400 mg intravenously) to 130/90 After 50 mg of H M B intramuscularly the pressure fell to 105/90 two hours later, and in another three hours to 150/100 She was then complaining of abdominal pain and was found to have considerable distension Various other drugs were tried and it was found that normal pressures could be maintained by two to three injections a day, each of 50, 75, or 100 mg

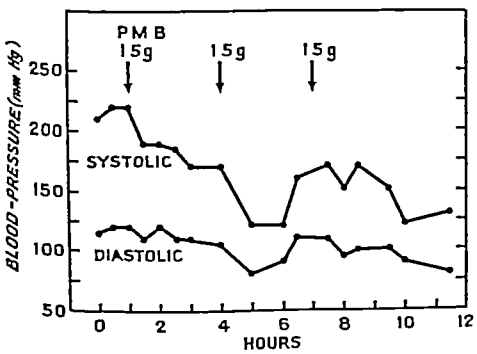
A single dose of 2 g of P M B resulted in a relatively normal pressure throughout the day (fig 5), but a feeling of giddiness except when lying down 1 g t d s was insufficient, but 1 5 g t d s produced reasonably satisfactory though somewhat varying effects The findings on two different occasions are shown in figs 6a and b The slightly larger dose it was desired to give was prevented by the abdominal distension it caused, which was not relieved by adrenaline Apart from this, she felt very well



5 (Case 2)—Effect of pentamethonium bromide by mouth (standing)

This case illustrates how difficult it is to evaluate the action of these drugs with any precision Though an lower all lower level may be maintained, there tend to be greater variations in pressure than in hypertensive patients not under treatment and such lability may be harmful.

Case 3 —Mr C, aged 68 had always been exceptionally energetic until ten years previously when he began to notice undue tiredness He consulted his doctor who found a high B.P., kept him off work for two months, and put him on a diet Thereafter he remained well until three months previously when he noticed momentary weakness and dizziness on climbing stairs After a short holiday he felt much better again. Two weeks before admission to hospital he was sitting on the blackboard in his class at school when he suddenly developed a headache, felt very queer for a few seconds, and found he could neither write nor speak He went outside for a drink of water and recovered completely within ten minutes His doctor prescribed phenobarbitone A week later he had a similar experience lasting a few minutes



6a (Case 2)—Effect of pentamethonium bromide by mouth (standing)

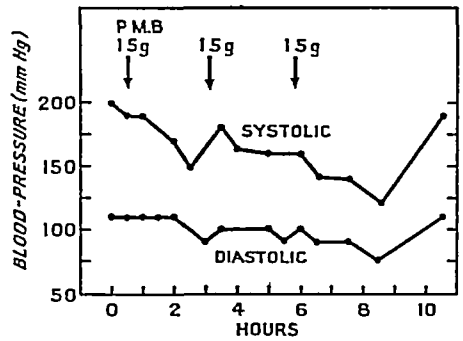


Fig 6b (Case 2)—Effect of pentamethonium bromide by mouth (standing) on another occasion

After this he was troubled with intermittent headaches but otherwise felt well No breathlessness or other relevant symptoms

General condition good but overweight Plethoric appearance No signs of cardiac failure Auricular fibrillation, pulse of high tension Apex beat not palpable, split first sound in mitral area accentuation of aortic second sound no added sounds or murmurs Casual B P readings 260/160 after rest in bed 240/130 Fundi no papilloedema hæmorrhages, or exudates grade II hypertensive arterial changes Lungs clear Other systems normal Screening moderate enlargement of left ventricle, aorta uncoiled and dense, no hilar congestion E C G s normal apart from auricular fibrillation Urine no albumin, casts, or cells Specific gravity concentration test 1022 Blood urea 30 mg per 100 ml

With amylobarbitone narcosis the B P fell to 135/95 and with T E.A.B to 150/85 Preliminary studies with H M.B by intravenous and intramuscular injections established that the B P was labile and could be maintained approximately within the normal range by repeated doses Side-effects were inconstant on one occasion he had vomiting and loose motions, on another he fainted in the bathroom (Though the possibility had been discussed, adequate advice about postural hypotension had not been given) 0 5 g H.M B and later 1 g given by mouth had little effect 1 g t d s resulted in an average pressure of 160–180/110–120 between 10 A M and 7 P M with a further fall to 150–160/100 in the evening When 1 g t d s was given for three consecutive days the average pressures were 175–190/120 On 1 5 g t d s they were 170–180/100–115 during the day with a fall to about 150/90 in the evening With 2 g t d s the average readings were 160–170/100–110 in the day and 135/100 in the evening at which time he felt faint These findings suggested a slight cumulative effect throughout each day

On one occasion he was given 5 g by mouth as a single dose when his resting pressure was 220/130 Six hours later, shortly after the pressure was found to be 140/105 (recumbent) he was sitting in a chair listening to the wireless when he suddenly found he could not speak, owing to weakness of the left arm he could not take off his dressing gown This reminded him of his previous attacks during teaching at school He recovered within ten minutes and did not send for a nurse or doctor When the house physician arrived half an hour later he was quite well, his B P was 180/130 lying and 100/80 standing Next day he had a slight headache and a tingling sensation in the left arm and leg He was troubled with diarrhœa and vomiting which was attributed to the H.M.B but the attack was presumably of hypertensive origin, of a similar nature to those he had previously experienced and unconnected with the fact that he was taking a hypotensive drug

Various other combinations were tried in an endeavour to find a satisfactory daily régime and again some degree of tolerance was apparent He lost all symptoms related to his hypertension and was troubled only by these occasional reactions and a vague feeling of malaise when under treatment He was getting anxious about his B.P and on the whole did not seem to be deriving much benefit Accordingly he was allowed home and at his urgent request back to work During the five months since then he has remained symptomatically well, though the general level of his B.P is unchanged

The wisdom of attempting to lower the blood pressure in a case like this is discussed below

EFFECT ON VENOUS PRESSURE

Observations were made on a woman with severe hypertensive congestive failure who had never been

difficult to maintain a fairly steady level for anyone leading a reasonably active life, even when wearing an abdominal belt or binder When these drugs are given, the pressure varies widely with rest and relaxation walking, sitting, standing, and emotion Perhaps because of varying absorption or metabolism, the variation is greater when the drug is taken by mouth Though these difficulties may be overcome by perseverance, they indicate the need for special care in administration to outpatients

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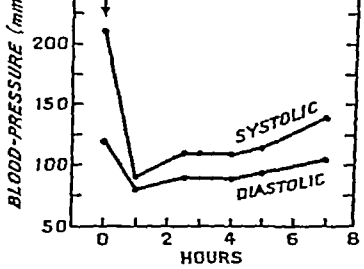

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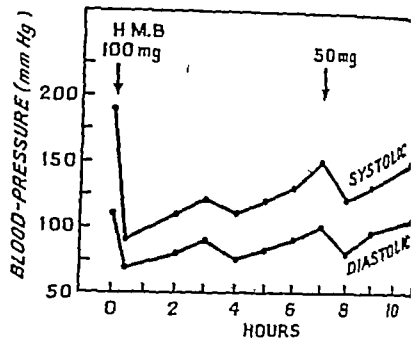

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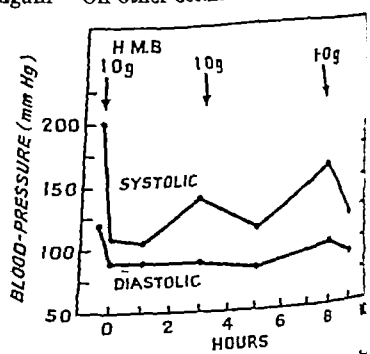

Fig 4 (Case I)—Effect of three intramuscular injections of hexamethonium bromide in the day (lying)

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) made to mask the difficulties In fact, emphasis n placed on them deliberately lest it should be , that a new era in treatment has come There , so very many patients in whom symptoms ary to hypertension cannot be relieved by other l means Undoubtedly, however there are some , these, especially when the hypertension is severe mptoms disabling, methonium compounds are of trial They usually relieve symptoms w far this relief is due to the drug and how far concomitant rest and relative freedom from ss or domestic affairs is not always easy to deter- Perhaps in such cases it would be best to discard hygmomanometer and try to find a dose of penta- nium bromide which will relieve symptoms without ns unpleasant side-effects Patient and practitioner en them may be able to decide

the long run, perhaps, the scientific approach is important

odynamics

essential hypertension, at least until advanced s are reached, cardiac output is unaltered , and surgical sympathectomy there is no material ge, whether or not the blood pressure is lowered ms et al 1941, Smith et al. 1946, Wilkins et al 1949) must mean that the total peripheral blood-flow is wise unchanged by operation and that any local ge in flow must be compensated for elsewhere In adjustments of flow throughout the body must be ly balanced.

n hypertensive patients, sympathectomy causes significant changes in blood flow through the kidney rcoran and Page 1941, Selzer and Friedman 1941, idley et al. 1942, Foa et al 1943, Talbott et al. 1943) hen the arterial pressure has been lowered by operation is possible that renal flow may be maintained by local scular adjustments in the kidney resulting in decreased nstance. Alternatively the fall of general arterial essure might be due to such decreased resistance ese problems are not yet solved. It has been reported m Stockholm that glomerular filtration renal blood- w, and the excretion of urine are reduced by an jection of T.E.A.B in normal persons (Aas and Blegen 49) If this is true of patients with hypertension, e methonium compounds may well have a similar verse effect

Cerebral blood-flow has been shown to be normal in icomplicated cases of hypertension (Kety and Schmidt 48, Scheinberg 1950) The relief of headaches by lanchnicectomy has been attributed to restriction of rebral blood flow (Fishberg 1948) Certainly vasomotor mstriction occurs in the upper limbs after this operation Despite more than ten years' study, the hæmodynamic fects of surgical sympathectomy are not yet thoroughly ide tood, nor are the reasons for success or failure own. When a fall of arterial pressure does occur it not even certain that this can be directly explained dilatation of the splanchnic bed (Wilkins et al 1949) In patients under treatment with methonium com- unds the blood-pressure falls considerably Observa- ons on cardiac output and blood-flow through various gans will therefore be of great interest Such studies ould certainly be made before there is any general ndency to treat patients with hypertension with these rugs

ections and Side effects

With 'medical sympathectomy" produced by the jection of a drug which paralyses the transmission of ve impulses through sympathetic and parasympathetic angha, the effects on the body may be widespread. ctually, with the doses employed to lower the blood- ressure to a satisfactory level, there is usually little obvious effect on other parts of the body such as the bladder or bowel. Some patients have gastro-intestinal upsets in the form of constipation, looseness or distension Some complain of a vague feeling of general malaise, and others of dryness of the mouth and slight mistiness of vision

Postural hypotension is the chief problem, and alarming collapse has been reported twice in patients under investigation elsewhere Assessments should therefore always be made in an institution in the first place, so that over reactors will be discovered During this period adrenaline should always be at hand.

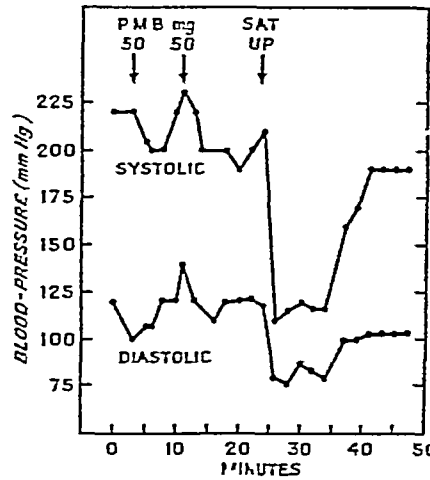

Fig 7—Effect of sitting up after intramuscular doses of pentamethonium bromide.

Effect of Posture

It must not be assumed that because with the patient recumbent, an injection causes little apparent effect on the blood pressure, the drug is not having any action.

Fig 7 shows the results of observations in one case 50 mg P.M.B was injected intravenously with the patient lying on her bed with no apparent effect Accordingly a further 50 mg was given, again with little effect Slight fluctuations in the resting B.P may be related to the natural reactions to repeated B.P recordings and the manipulations needed for the injections together with the activities of an ophthalmologist who was endeavouring to study the effects on the retinal vessels She was then asked to sit up, whereupon the pressure fell promptly On lying down again it gradually rose to the previous levels.

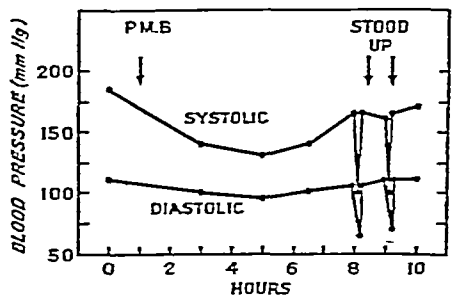

Fig 8—Effect of posture eight hours fter 5 g of pentamethonium bromide by mouth.

Another patient who was up and about was given a single dose of 5 g P M B by mouth and the pressures were recorded at intervals throughout the day after lying down (fig 8) Twice during the evening the pressure was recorded before she lay down, and as can be seen from the figure considerable postural hypotension was still evident.

Tolerance and Intolerance

It is difficult to be sure about the development of increased tolerance to the drugs, but the evidence suggests that it may occur in some degree. No instance of idiosyncrasy has been observed.

Choice of Preparation

As regards investigation and treatment, we have found little difference between the four preparations used—the iodides and bromides of pentamethonium and hexamethonium Pentamethonium bromide, which

treated with rest, digitalis, mercurial diuretics, or even sedatives

A continuous intravenous heparin drip attached to a water manometer was used to record venous pressure Arterial pressures were taken at short intervals on the other arm with an ordinary sphygmomanometer After a preliminary period of observation P.M B was injected into the venous drip The arterial and venous pressures fell to normal levels simultaneously and were maintained there over a period of two hours by occasional injections of P M B through the rubber tubing Screening examination had shown considerable pulmonary congestion and probably œdema

As a simple clinical experiment it was then decided to see whether a continuous state of lowered venous pressure induced by P M B would result in a diuresis and hence prove of benefit to the patient Fluid balance was assessed by intake and output charts and daily weight recordings She was confined to bed and on a standard ward diet so that other factors which might influence these observations were reasonably static

A patient with hypertensive congestive cardiac failure and increased venous pressure might be assumed to have a low cardiac output, and be expected to respond to lowering of this pressure by increased cardiac output This might be followed by beneficial diuresis However, in this instance other factors are clearly not necessarily equal, because, apart from simultaneous lowering of the arterial B.P , the effect of methonium compounds on the rest of the autonomic nervous system can hardly be assessed clinically and may well be varied and profound It is quite possible, indeed, that renal blood flow and glomerular filtration will be reduced, because this has been shown to occur with T.E A B which also paralyses autonomic ganglia This aspect of the problem is being investigated and will be referred to below

In fact the administration of P M.B by intramuscular injection three times a day, to maintain a more or less continuous state of lowered blood pressure over a period of three days, had no effect whatsoever on the fluid output in this patient , nor was there any relief from her attacks of nocturnal dyspnœa Nevertheless, as might be expected, an injection of a mercurial diuretic ('Neptal') resulted in a prompt and considerable diuresis, and dyspnœa was rapidly relieved A subsequent course of injections steadily reduced the pulmonary congestion and peripheral œdema until water retention was abolished and the patient was able to resume her normal activities Over a stone in weight was lost during the first four days

A state of relative hypotension produced by pentamethonium bromide was of no obvious value in the treatment of this patient It had been explained to her that these observations were a preliminary to treatment and she was asked to comment on any sensations experienced In fact there were none, and symptomatically she appeared unaffected

DISCUSSION

It must now be considered whether it really is desirable to lower the blood pressure, at any rate by this means, in patients with established hypertension Theoretically there are obvious advantages if symptoms related to the hypertension—e g , headaches—can be relieved, left ventricular failure postponed, the chances of a stroke diminished, and renal function improved It may be that the vicious circle of hypertension and vascular narrowing described by Wilson and Byrom (1939) could be broken It is known that strain on the left ventricle may be relieved by sympathectomy , an enlarged heart may be reduced in size and abnormal E C G changes reversed On the other hand it may not be desirable to lower the blood pressure in hypertensive patients with cerebral symptoms of uncertain etiology If there has been a cerebrovascular accident due to hæmorrhage, it would seem logical to lower the pressure to reduce the risk of a further episode , but if the trouble has been due to thrombosis the risk might well be increased by lowering the pressure If the condition is due to vasospasm—a common supposition in cases of hypertensive encephalopathy—to lower the pressure would again seem desirable But in particular cases one often does not really know what the and there is no certain means of finding out

The Three Cases Reconsidered

In case 1 the patient died from pulmonary em during the second stage of his surgical sympath a most unusual happening It had been thoug his breathlessness on exertion was somewhat out proportion to the other evidence of hypertensive disease, but he had not had ischæmic pain, and cardiograms (including seven precordial leads) quite normal Post mortem examination showed only thrombosis in the profunda femoris veins but very extensive coronary atheroma with much of the lumen There were also several small my infarcts apparently about ten days old This have been about the time of his first operation he was up and about in the ward feeling extremely from the third day, it seems probable that these areas of infarction developed during the course of the first operation when for a time his blood pressure unduly low (as reported by the anæsthetist) It well be that the venous thrombosis in the leg, which not evident clinically, developed at the same If myocardial infarction can occur under such cir stances, it is at least conceivable that the same t might have happened during a spell of undue hypoten induced by methonium compounds

In case 2 the patient was a schoolmaster who had symptoms probably due to vasospasm, for which reduction of blood pressure would presumably be beneficial As a matter of fact we do not yet know the effect on cerebral blood flow when widespread vasodilatation is produced by this group of drugs It may well be that hypertensive attacks are sometimes based not on vasospasm but on small cerebrovascular accidents. Post mortem, multiple areas of cerebral softening are often seen and cannot be related to localised cerebral arterial occlusions Such areas may well result from temporary slowing of cerebral blood flow with resultant irreparable damage to the delicate brain cells Yet symptoms whic can be related to these episodes are often short live and clinical evidence of residual damage is slight absent On other occasions a patient who has had an apparent vasospastic attack subsequently succumbs to a manifest cerebral thrombosis Clinically the exact pathological state cannot always be judged with accuracy, and errors in treatment are therefore possible. Is it wise to attempt reduction of the blood pressure in patients such as this schoolmaster? During the day when he was maintained in a state of permanent lowered blood-pressure, he certainly felt less well His body was presumably adapted to his hypertension , or possibly the hypertension had become a necessary accompaniment of his arteriolosclerosis

The third patient had had temporary loss of vision in the right eye, followed shortly afterwards by blindness in the left eye which proved to be permanent She sought advice two years later because of what she considered to be premonitory symptoms in her good (right) eye Her fears were natural enough Optic atrophy in the left eye was evidently based on occlusion of the retinal artery, but whether this was really due to spasm or to thrombosis was merely guesswork Dr G I Scott informed us that spasm for twenty minutes or so would probably be followed by permanent blindness A drug capable of relieving such spasm, if easy to administer, would be valuable indeed But if the catastrophe was really due to retinal artery thrombosis, lowering the blood pressure might be disastrous Experiments with powerful drugs must not be lightly undertaken

No New Era of Treatment

The cases discussed have been selected to illustrate as many facets of the problem as possible and no attempt

made to mask the difficulties In fact, emphasis
1 placed on them deliberately lest it should be
that a new era in treatment has come There
so very many patients in whom symptoms
rv to hypertension cannot be relieved by other
means Undoubtedly, however, there are some,
these, especially when the hypertension is severe
mptoms disabling, methonium compounds are
of trial They usually relieve symptoms
w far this relief is due to the drug and how far
concomitant rest and relative freedom from
s or domestic affairs is not always easy to deter-
Perhaps in such cases it would be best to discard
ıygmomanometer and try to find a dose of penta
nium bromide which will relieve symptoms without
is unpleasant side-effects Patient and practitioner
en them may be able to decide
the long run, perhaps, the scientific approach is
important

ydynamics

essential hypertension, at least until advanced
s are reached, cardiac output is unaltered, and
surgical sympathectomy there is no material
ge, whether or not the blood-pressure is lowered
ms et al. 1941, Smith et al 1946, Wilkins et al 1949)
must mean that the total peripheral blood flow is
rse unchanged by operation and that any local
ge in flow must be compensated for elsewhere In
adjustments of flow throughout the body must be
lv balanced

1 hypertensive patients, sympathectomy causes
ngnificant changes in blood flow through the kidney
rcoran and Page 1941, Selzer and Friedman 1941,
dley et al. 1942, Foa et al 1943, Talbott et al 1943)
ıen the arterial pressure has been lowered by operation
s possible that renal flow may be maintained by local
cular adjustments in the kidney resulting in decreased
istance Alternatively the fall of general arterial
ssure might be due to such decreased resistance
ese problems are not yet solved. It has been reported
m Stockholm that glomerular filtration, renal blood-
w, and the excretion of urine are reduced by an
ection of T.E.A.B in normal persons (Aas and Blegen
49) If this is true of patients with hypertension,
3 methonium compounds may well have a similar
verse effect

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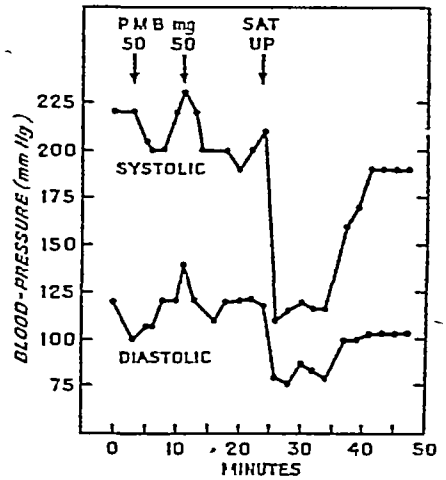

Fig 7—Effect of sitting up after intramuscular doses of pentamethonium bromide

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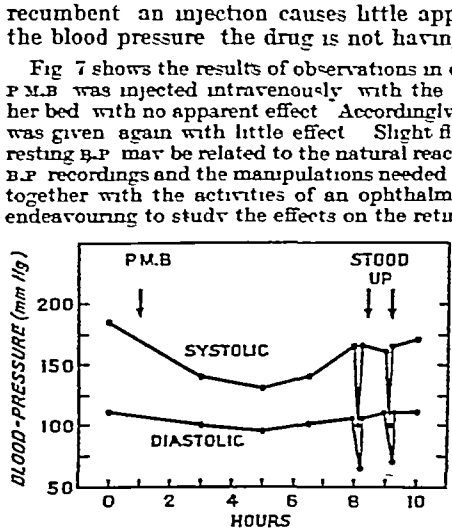

Fig 8—Effect of posture eight hours after 5 g of pentamethonium bromide by mouth.

Another patient who was up and about was given a single dose of 5 g P.M.B by mouth and the pressures were recorded at intervals throughout the day after lying down (fig 8) Twice during the evening the pressure was recorded before she lay down, and as can be seen from the figure considerable postural hypotension was still evident.

Tolerance and Intolerance

It is difficult to be sure about the development of increased tolerance to the drugs, but the evidence suggests that it may occur in some degree No instance of idiosyncrasy has been observed.

Choice of Preparation

As regards investigation and treatment, we have found little difference between the four preparations used—the iodides and bromides of pentamethonium and hexamethonium Pentamethonium bromide, which

we have chiefly used, and which is probably the most suitable preparation at present available, is unfortunately hygroscopic and this precludes its manufacture in tablet form

Administration

For parenteral therapy, ampoules have been used, or else the powder dissolved in distilled water and sterilised by heat Intramuscular injections are not painful For oral therapy appropriate amounts of powder have been administered in a flavoured aqueous solution This is not unpleasant to taste Tablets or an elixir would be an obvious advantage and the latter is likely to be available shortly

100 mg of P M B is a suitable intramuscular dose to give to an adult of average weight to see whether the hypertension is labile If this is the case, the injection may be repeated two or three times during the day at appropriate intervals 1 g of P M B is a suitable dose to give by mouth in the first place and if insufficient 2 g may be tried the next day Thereafter 1, 1 5, or 2 g t d s has been found the most generally useful régime

CONCLUSIONS

The methonium drugs have as yet no place in the routine management of patients, though they may prove useful in the treatment of resistant symptoms related to hypertension We need more information about their precise action, and for the present it will be most profitable to study, in detail, patients who might otherwise be treated by sympathectomy

There is no evidence as yet that continuous reduction of blood pressure by drugs which paralyse the autonomic ganglia will prove beneficial in the long run to hypertensive patients, and it may well prove harmful to some of them Even if desirable, it is not easy to achieve with the drugs investigated On the other hand, there is no reason to doubt that other more efficacious and perhaps more selective preparations will be made, and possibly a study of the methonium compounds will throw light on the ætiology of essential hypertension

Thanks are due to Messrs May & Baker for generous supplies of these preparations, and to Dr W R Thrower, their consulting physician, for his constant interest and advice

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PENTAMETHONIUM IN HYPE

STEPHANIE SAVILLE
M B Dubl.
HOUSE PHYSICIAN, ST MARTIN'S HOSPITAL, BRI

FOR many years a clinic for hypertension has held at St Martin's Hospital, and some of the have now been observed for a long period needed treatment, others none Many with " hypertension of varying degree have headaches, giddiness, failing vision, breath other symptoms, and examination has revealed arterial degeneration, retinal changes, and renal failure The customary treatment has in bed, sedation, and regular venesection, patients have failed to respond significantly maintain initial improvement Recently some with serious symptoms, who were not respo factorily to these measures, have been tentativ with pentamethylene bistrimethyl ammonium, called pentamethonium, in the form of its brom iodide salts None were cases of "benign" hy

At first the patients were admitted to hospital, already inpatients, to permit accurate recording of progress Later, however, some were successfully as outpatients or were able to continue trea home The aim throughout has been to lower blood pressure enough to relieve symptoms but enough to provoke others due to hypotension present there seems to be no way of foretelling response, and treatment has to be arranged individu In actual fact, however, none of the five cases treated to date has failed to obtain relief from symptom As might be expected, subjects with inelastic vessels not show, and do not require, the striking fall blood pressure seen in the more labile type of p after the use of the new drug Throughout the inv gation blood pressure records—whether hourly, da or weekly—have been taken as nearly as possi under standard conditions Except in special cir stances no dietetic restrictions have been imposed

ADMINISTRATION

At first we injected the pentamethonium salts (i the bromide) intravenously, in doses of 10 mg dissol in distilled water, but the effect was too sudden too short We therefore gave the drug by intramusc injection, and subsequently by mouth

Our present practice is to test the initial response giving one or two doses of 50 mg intramuscularly, then to start daily treatment by mouth The dosage varies, but is usually 0 5–1 0 g every four, or eight hours The first dose should be taken as e as possible in the day We have found no signific therapeutic difference between the bromide and iodide salts

By mouth the drug is most conveniently taken in form of a flavoured aqueous solution As pentamethon bromide is deliquescent, no wholly satisfactory t has yet been made

CLINICAL RESULTS

The following notes show how the five pati responded

Case 1 —Mr A aged 63, had been attending for years with headaches, giddiness, insomnia, and depre He had moderate arteriosclerosis with retinal change his resting blood pressures averaged 260/130 mm Hg

Treatment with pentamethonium bromide was starte Dec 8 1949 He was given 10 mg intravenously an three minutes his B P fell from 220/140 to 205/110 tw minutes later it had risen to 220/130 A further dos 10 mg intravenously produced readings of 195/130 At end of January when enough pentamethonium was avail to permit uninterrupted treatment, 400 mg was give

hree times a day and during the whole of February remained about 235/125 His symptoms began to ar and he was soon able to sleep without barbiturates ig March an attempt was made to produce a more essure curve by giving 300 mg orally four times a his produced a B.P of 215/100 one week later, and urther treatment an average B.P of 210/100 over a At this juncture, for a short time he was unavoid ithout treatment, but though his B P was once) his symptoms did not return apart from occasional hes

oughout April, May and June treatment was continued ,00 mg four times a day His resting systolic B.P l between 220 and 240 but his diastolic pressure ned remarkably constant at about 110 compared with erage of 130 before treatment His headaches and ies have disappeared and now he feels and certainly a different man His discs still show the characteristic rances of senile hypertension but his vision has improved

se 2—Mrs B aged 42, had been treated since 1948 vpertension of a malignant type with symptoms pro ively worsening until January, 1949 when she became idden. After lying in bed for five months, with severe aches she began to have encephalopathic attacks and admitted to hospital on Oct 1, on which day she had fits

n admission she was conscious but depressed and operative Her blood pressure was 240 140 she had al changes with papilloedema and deteriorating vision tendon reflexes were exaggerated and the plantar response extensor on both sides After venesection her condition roved, though her right arm was still weak and the right anski reflex positive Power in her right upper limb had urned by Oct 11 but she still had a right foot-drop and ggerated reflexes on the affected side Her B.P was netimes as low as 170–190/100–110 but generally varied tween 210/110 and 240/140 and on one occasion reached 0/160 In November she was having encephalopathic tacks almost daily, each lasting about fifteen minutes ring which time her limbs twitched and she was noisy mpathectomy was considered but she refused operation d left hospital on Dec 7 On Dec 24 1949, she had such severe fit at home that she was readmitted to hospital, at after a few days palliative treatment she was discharged On Jan. 5 1950 she was readmitted for treatment with ntamethonium Her average blood pressures were then 0/140 and they stabilised at about 180/120 on regular tramuscular injections of 30 mg every six hours

During February she was given 300 mg of pentamethonium romide by mouth every eight hours and her B.P averaged 90/110 She said she felt infinitely better, and she became ell enough to be treated as an outpatient, having had no urther cerebral attacks In early March, while still very ell, with her B.P remaining at about 180/120 she was nable to obtain the drug for five days and had to be read mitted with a severe encephalopathic fit the only one since reatment started Her B P had risen to 230/170 On her ecovery treatment with pentamethonium bromide was ecommenced 1 0 g being given by mouth four times a day She improved enough to return home by the end of April he was free from headaches and sleeping normally, having n average B.P of 190/115

Shortly afterwards she had a swimming' sensation on rising in the morning—presumably due to postural hypo ension—and some difficulty in reading due to the mydriatic ffect of pentamethonium By May however, the side-effects f treatment had disappeared and her B.P was 180/125 at est The daily dose of 1 0 g four times a day was continued Early in June (B.P 210/130) she developed what appeared to be a bromide rash on the posterior surface of her legs so 5 minims liq arsenicalis was added to each dose of her mixture with good effect She remained free from ocular symptoms but ophthalmoscopic examination revealed the characteristic features of malignant hypertension She remains generally symptom free and is able to move around the house in a restricted manner

Case 3 —Mrs C aged 57 had been under observation for ten years with essential hypertension for which she had been taking increasing amounts of barbiturates— sufficient to make her permanently drowsy She was a donor for the blood bank and was bled regularly

During 1949 her general condition deteriorated and she developed gross retinal changes being unable to read headlines after June In October she was admitted with congestive heart-failure, her average B.P being 220/150 Despite treatment her œdema persisted and her B.P in December was 230/145 Intramuscular injections of pentamethonium bromide 50 mg at first produced excellent results her B.P falling from 240/140 to 150/80 in one hour Taken at subsequent hourly intervals the readings were 160/70, 160/90 200/100 190/100 and 160/100 four hours later they had risen to 240/120

After a period of intramuscular treatment with good effect 0 5 g was given orally three times a day Her headaches disappeared her œdema resolved, and at the end of February she was fit to get up and later go home with her B.P stabilised at about 200/110 She could now read a letter She was able to lead a restricted life at home but did not take her pentamethonium bromide regularly and was not seen until March 30 Her B P was then 200/130 her heart was still enlarged, and there was slight œdema in the legs The improvement in her vision had not been maintained and there was a new patch of exudate in her right eye She was encouraged to continue treatment with pentamethonium, but owing to distance she has not attended for examination

Case 4 —Mrs D, aged 41, had long been under observation with a slowly progressive hypertension, which had made her an invalid for the past eight years She had been bedridden since 1948 but was admitted to hospital from time to time for a check up and possible treatment In recent times her principal complaints had been giddiness, headaches and swelling of the legs

In December, 1949, she was admitted with signs of hyper tension and congestive heart failure her B.P being 240/120 Treatment with pentamethonium bromide was begun and after some experimental doses 0 5 g by mouth four times a day was found most suitable The effect was to stabilise her B P at about 180/100 the signs of congestive failure disappeared and she was discharged from hospital in March She is now up and about at home

Case 5 —Mrs E, aged 60 came under observation early last May, with two months' history of severe headaches insomnia and breathlessness on stairs She had continued normal activity until one morning she collapsed in chapel, and ten days later she had become unconscious while shopping She was found to have palpable radial arteries early changes in the retinal vessels and a B.P of 220/140, radiography showed cardiac enlargement with dilatation of the aorta

Receiving oral therapy from the beginning, she was put on 0 5 g pentamethonium bromide every six hours as an outpatient The systolic pressure fell to an average of 190 and the diastolic pressure to about 120 at which levels they remain Her general condition has strikingly improved, she is now free from giddiness and is sleeping well, and her breathlessness has ceased She has resumed work, continuing to take 0 5 g of the drug every six hours

The principal side-effect to be watched for is postural hypotension With experience in adjusting the amount and time of dosage little trouble has been encountered, but all patients are instructed to assume the erect position by easy stages and to sit down if they have any prodromal symptoms In two patients pentamethonium has caused a transient interference with visual accommodation and in another some conjunctival congestion One patient developed a bromide rash No evidence of impaired renal function attributable to the drug has been observed.

DISCUSSION

Though no case of malignant hypertension in a young person has come under observation, the cases cited are representative of the common types of hypertension requiring treatment It will be noted that the initial improvement obtained with pentamethonium was maintained in all but one (case 3) The original state of this patient was so grave that symptomatic relief was the most that could be expected. Whether in fact pentamethonium can reverse a steadily progressive condition time alone will show but it is conceivable that early and assiduous treatment will improve the prognosis In the other patients described severe symptoms have been relieved

for as long as six months, and there is no sign that the drug is losing its effect

In the early stages of this investigation close attention was naturally paid to blood pressure records There is no doubt that blood pressure levels can be influenced almost at will by means of the drug, and its effect on the diastolic pressures is highly important But it became evident that its real value lies in its ability to relieve, at least temporarily, symptoms which are not only distressing to the patient but are of grave medical significance Systolic pressures may at times be not appreciably below pre treatment levels, but this does not seem to affect the symptomatic relief In case 1 the systolic readings after six months are little short of the average before treatment started, but the pressure remains lower, and the sustained in general condition is striking

CONCLUSION

The results in 5 patients suggest that pentamethonium bromide may be useful in the treatment of at least some forms of hypertension In all these cases it has relieved troublesome symptoms and has apparently arrested the progress of the disorder

This investigation has been made possible by the coöperation of Dr C D Cross and other members of the of St Martin's Hospital, and thanks are due to Messrs May & Baker Ltd. for supplies of the compounds used.

Reviews of Books

Major Symptoms in Clinical Medicine

JOHN ALMEYDA, M R C P, senior registrar, Royal Chest Hospital, London. London Henry Kimpton 1950 Vol 1 Pp 378 25s

THIS is the first of two volumes designed to combine, for the assistance of examination candidates and busy practitioners, the anatomical and physiological explanations of symptoms, together with their significance and the mode of their investigation Dr Almeyda has endeavoured to separate objective from subjective symptoms, prefacing each section in the book with a short description of their anatomical and physiological background, their mechanism, and their classification The inclusion of separate chapters on lassitude and nervousness and on hiccup will be welcomed by most readers Many of the illustrations are case-photographs borrowed from other works These are supplemented (not always happily) with some of the author's own cases, with an ambitious collection of heavily overdrawn sketches to emphasise characteristic facies, and with numerous poor quality diagrams and line drawings It is a pity that the standard of illustration falls so far below that of the general production

Fundamentals of Psychoanalysis

FRANZ ALEXANDER M D, director, Chicago Institute for Psychoanalysis, clinical professor of psychiatry, University of Illinois London Allen & Unwin 1949 Pp 312 16s

Professor Alexander's book on *The Medical Value of Psychoanalysis* was due for revision he decided to write a new book instead, of which this is the first part, the second part will deal with the psychosomatic approach to medicine He no longer thinks it necessary to trace the historical evolution of Freudian theory, he abstains from reproducing elaborate case histories, and he devotes his efforts mainly to the presentation of fundamental theory and its application to treatment In respect of instincts or drives, however, he avoids theoretical discussion about the ultimate nature of these forces The book is an admirable account of psycho-analysis as taught in the Chicago school the language is clear, terms are used with as much precision as the subject matter allows, and there are only occasional lapses into the weakness of claiming too much After introductory chapters on the position of psycho-analysis in medicine and the nature of psychological understanding, Dr Alexander sets out a somewhat original view of the basic principles of psychodynamics—the principle of stability (the psychological equivalent of homeostasis), the principle of economy or inertia (corresponding in large measure to Freud's "repetition compulsion"), which permits energy to be conserved, and the principle of surplus energy, which is a source of sexual activity and therefore of reproduction Expositions of sexuality and the functions of the ego are followed by a consideration of the sociological factors which influence personality development Chapters on the psychology of dreams, wit and æsthetics, psychopathology (as studied in the phenomena of mental illness), and the principles of psycho analytic therapy conclude the book. The chapter on therapy reflects the modifications of standard Freudian procedure which the Chicago analysts have developed within the last few years, especially their insistence that emotional experiences outside as well as within the therapeutic situation are the main therapeutic factor A well-selected bibliography, not restricted to psychoanalytical writings, appears at the end of each chapter

Atlas of Drawings for Chordate Anatomy

SAMUEL EDDY, professor of zoology, University of Minnesota London Chapman & Hall 1949 Pp 180 28s

THIS atlas, elementary in scope, consists of semi-diagrammatic unlabelled drawings of dissections of representative chordates, most of which are obtainable in this country Illustrations are included of the nervous, vascular, reproductive, digestive, and muscular systems. Their object is to assist the dissector, and to save the time he usually spends in making his own drawings However, Professor Eddy's belief that the labelling of supplied drawings will impress the dissected structure on the student's memory and stimulate his understanding of it will probably not be shared by all teachers Most of the drawings are accurate and fairly clear, but they will certainly need to be supplemented For example, there are diagrams of the brain and the brachial plexus, but no indication of the destination of the nerves arising from them In spite of such deficiencies, the book will have its value in supplying a class with diagrams not readily procurable elsewhere

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Clinical Chemistry (4th ed Philadelphia and London W B Saunders 1949. Pp 642 40s)—This well known textbook by Prof Abraham Cantarow and Mr Max Trumper, PH D, shows evidence of revision in the chapters dealing with carbohydrate and protein metabolism, renal physiology, and endocrine glands New material has been added on liver function tests, renal injury in the crush syndrome, potassium therapy, methods of investigating adrenocortical function, and the like, most of which are not recent observations The last cover page appropriately tabulates the normal chemical standards (incidentally, the standard urea clearance should be 54 instead of 74 c cm) The field of clinical biochemistry is covered well the book is easily read, and there is a good index

A Short Textbook of Surgery (5th ed London J & A Churchill 1950 Pp 676 30s)—The new edition of Prof C F W Illingworth's well known textbook includes recent advances in the surgery of the blood vessels, and new sections on pulmonary stenosis and portal hypertension The section on treatment of infections of the fingers and hand—a subject constantly evolving—has been altered considerably to chime with modern views, and there are many minor amendments One new plate and several new figures have been added, but one or two of the old ones still need revision Like many another British author Professor Illingworth has striven successfully to keep the size of his book in bounds indeed, he has pruned so ruthlessly, he tells us in his preface, that he has even saved a few pages—four to be exact

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ELSEVIER'S ENCYCLOPEDIA—Owing to devaluation the price of this work to subscribers (see *Lancet*, July 8, 1950 p 58) has had to be increased to £9

QUINIDINE IN DISORDERS OF THE HEART—The English publishers of this book which was reviewed in our issue of Aug 5 (p 214), are Cassell & Co and the price is 16s

THE LANCET

LONDON SATURDAY, SEPT 2, 1950

ING to a dispute in the printing industry ring a great many of the periodicals ed in London, this issue of THE LANCET is oidably reduced in size and the next few s will be affected if the dispute continues

Back to the Land

In agriculture the replacement of the horse by the tor and the use of power on the farm have given a new petus to development In England and Wales the al farm supplies of power (excluding transport) rose n just over one million horse power in 1908 to two Lon in 1939 and five and a half million in 1948 Of this se provided 87% in 1908 25% in 1939 and only 7% 1948'—SIR HAROLD HARTLEY F R S in his presidential dress to the British Association in Birmingham

he British people tend to cherish their farmers—their soldiers—only in times of war During ceful intervals agriculture seems to many towns- a backward industry kept alive only by statutory perations A very different idea is conveyed by STERBROOK s review,[1] which he has done with the p of the economic information unit of the Treasury d of other Government Departments

In the first half of the nineteenth century the world macy of British farming was undisputed, but hard ies followed. "With a flexibility which probably other great industry could claim, British agriculture s achieved a series of fundamental changes to meet ations in which the dice always seemed loaded unst the home farmer,' says EASTERBROOK "First ol then grain and later meat came rolling into r ports, all produced at small expense from the vast tches of virgin land which our capital, our railways, d our steamships were opening up overseas In ance and Germany, in fact in most of Europe, vernments protected their farmers against such mpetition. The virgin territories of the New orld were exploited without thought for the future ar after year the soil was made to yield its riches, d nothing was put back into it" Yet even in the s half our beef and half our mutton came from our n soil, together with almost all our potatoes, half r eggs a quarter of our cheese, and a third of our meat By now, however, farmers had "settled wn into that attitude of inferiority which seems the vitable lot of the poor relation' Yet they still lieved that one day the country would need them am And so it did Between 1939 and 1943 wheat oduction in the United Kingdom rose from 1½ llion tons to 3½ million tons The harvest of rley, oats, and other grains rose from 4 million to er 5 million tons, potato production was doubled, d the milk-supply was kept up despite the loss of million acres of grazing and almost all the imported w cake Since then some of the enthusiasm which derlay this feat has inevitably been dispelled but output per man is by far the highest in Europe, and no other country has such a concentration of tractor power

Today there is good reason—apart from special war-time risks—for the nation to foster its agriculture as never before Until the late war began, food was bought cheaply in the world market in exchange for British manufactures, but the cost of imported food has risen because of the relative devaluation of our manufactured goods, due to world industrial production rising much more sharply than food production Thus we now depend on the skill of our farmers no less than on that of our manufacturers, the export drive is more publicised than the effort to produce more food, but the O.E E C concluded that the most promising way of saving dollars was by agricultural expansion[2] Such expansion will require stern effort This week Prof H D KAY, F R S, who is president of the section of agriculture of the British Association, said "Were every pole of derelict land brought back into cultivation and the utmost—consistent with economic sanity—done with other marginal land, we could not raise production at home from its war-time peak of some 40–42% of our food requirements to the 50% or even more that is our first objective, without growing at least 20% more food per acre on a very substantial proportion of our present cultivated area" As a dairy farmer, THOMPSON[3] has named these as the most important factors contributing to better farming disease control, controlled marketing and the distribution of knowledge through the agricultural press and the National Advisory Service efficient costing he also rates highly Modern farming thus calls for varied knowledge and a receptive mind and Professor KAY suggests that one way to promote further expansion would be to help scientifically trained and practically minded young men who lack capital to start farming on their own He believes that the best hope of greater production is by full application of scientific and engineering knowledge and of modern methods of management Evidently, though our fields have already yielded more than some would have believed possible a decade ago, the limit has still to be reached

Aortic Embolectomy

SADDLE embolus of the aortic bifurcation is a comparatively rare but highly fatal condition. About 200 cases have been published, and, since most of them were associated with serious heart-disease, it is not surprising that three-quarters of the patients died immediately There must be many more unrecorded cases, and the immediate mortality-rate is probably even higher than this A typical case is easily recognised the patient with auricular fibrillation or recent myocardial infarction suddenly collapses, and there is pain, pallor, paralysis, pulselessness, and paræsthesiæ in both legs EWING,[4] however, emphasises the difficulty of diagnosing cases with an insidious onset and the importance of observing carefully the physical signs of arterial insufficiency Even if the patient survives the initial catastrophe he is likely to die from shock, cardiac failure, or further embolism, and treatment is usually unavailing Nevertheless, 26 "cures" have been reported after embolectomy,[5] and

1 Easterbrook, L. F. Prospects for the Land H.M. Stationery Office. Pp 46. 1s

2 See *Times* Dec. 1 1949

3 Thompson J H. *Farmers Weekly* July 28 1950 p 53

4 Ewing M R *Brit J Surg* 1950 38 44

5 Albright H L Leonard F C *New Engl J Med* 1950 242 271

13 further patients, including EWING's 2, have survived the operation There have been 8 more "cures" by conservative treatment (including sympathectomy) alone and 4 spontaneous recoveries

How, then, should a particular case be treated? The initial shock should be treated with morphine alone, for patients with serious heart-disease do not tolerate rapid transfusion If the response to morphine is good, the decision must be taken whether or not to operate, and both EWING in London and ALBRIGHT and LEONARD in the U S A advocate embolectomy if the patient seems fit to stand the operation It should be remembered, however, that there have probably been several unsuccessful attempts at embolectomy which have not been reported Moreover, there is a growing tendency [6] to treat emboli in general conservatively, on the grounds that they are often multiple and the patients do not survive for long, that thrombosis often occurs at the site of the embolectomy, and that modern conservative measures, if properly applied, give as good results as surgery If embolectomy is decided on it should be done as soon as possible, preferably within six hours Either general or spinal anæsthesia may be used, and both have the advantage of opening up collateral vessels by causing peripheral vasodilatation The aorta and common iliac vessels are best approached through the abdomen, with the patient in the Trendelenburg position If the embolus cannot be felt, the lower limit of aortic pulsation will indicate its position. The posterior peritoneum is incised and rubber tubes are passed round the aorta and common iliac vessels to control bleeding Those round the iliac vessels should only be tightened if this is necessary, because one cannot be certain of the *lower* limits of the embolus and there is danger of breaking it up It has been usual to incise one iliac vessel and extract the embolus in one piece, if possible, or piecemeal by "milking" it round from the other vessel But this procedure, as in EWING's cases, often produces serious narrowing of the vessel when the incision is sutured, and it seems better to make the incision directly into the aorta immediately above the bifurcation When the embolus has been extracted, the incision is sutured with an arterial ligature, taking care not to penetrate the intimal coat Local hæmostatics are applied if needed

Various other measures may be useful either instead of or in addition to embolectomy The heart must be controlled with digitalis, &c, and oxygen may be needed Heating and elevation of the legs must be avoided Most people advocate heparin and dicoumarol or heparin alone, with proper laboratory control, to prevent thrombosis spreading from the site of the embolus Papaverine has been used extensively as an antispasmodic, but the penta and hexa methonium compounds which can be given by mouth, may largely replace it Paravertebral procaine block of the lumbar sympathetic chains and spinal anæsthesia involve a risk of serious bleeding if anti coagulants are used at the same time, the methonium compounds may make these measures unnecessary After the acute phase has passed, and if the cardiac condition is good, bilateral lumbar sympathectomy may be considered ALBRIGHT and LEONARD suggest that this may be performed at the same time as embolectomy However, it is important to remove the first lumbar ganglia, so as to produce v in the collateral vessels at the region of the and these cannot be reached through a sul incision Division of the lumbar chain lower aggravate the condition of the legs by vasodilatation below the level of the block Amputation will, of course, be necessary if becomes gangrenous

Agreement will not be reached on the best of treating this uncommon condition unless who encounters an example records his It is especially important that the failures as the successes should be widely published

6 Allen E V Barker N W Hines E A Peripheral Vascular Diseases Philadelphia 1946

7 Ratcliffe A H Jepson R P J Neurosurg 1950 7,

Annotations

TRENDS IN GENERAL PRACTICE

IN England and Wales general practitioners are becoming more evenly distributed In the report to Minister of Health on its second year's work, the Practices Committee prophesies that this trend continue "until a state of equilibrium is more reached" A simple formula is required, to focu on areas which need extra doctors more urgently the number of patients per doctor suggests "In areas," the report says, "doctors have lists well the average together with large mileage co and are often obliged to dispense medicines for patients In addition some of the doctors are in co with the Regional Hospital Board or a Hospital Man ment Committee for a varying number of weekly sess The overall work of these practitioners may exceed of many doctors with full lists in urban areas T is also the factor of the varying level of demand medical care in different areas"

During this second year of the service 1242 were admitted to medical lists, and 912 were The number of doctors newly entering into partners with established practitioners was 374 Replacem vacancies totalled 690, and 178 assistants succeeded became partners of, their former principals (this figure does not include assistants appointed as to other vacancies) Of 256 applications to start practices, all but 6 were granted On Jan 1, 1950, number of assistants was about 1700 Some who started practice in the more popular districts to have little prospect of ever achieving a in their present location" London seems to b particularly difficult area, and the committee suggests that parts of it should be "closed" to entrants The report notes regretfully that wishing to start new practices are often baulked by difficulty of obtaining suitable premises Though local authorities are coöperative, this applies as to the new development as to the built up areas general practitioner services should, says the mittee, be expanded as the new population move in not be provided as an afterthought As to practices, the outgoing doctor's premises have been obtained by a doctor other than the succ applicant for the vacancy—a procedure "calculate set at naught the machinery of appointment to pra under the Acts and Regulations" However, a satisfa solution is expected soon The machinery for ap ment to advertised vacancies has been criticised cumbersome, but lately successors have been over before the retiring doctor has withdrawn with death vacancies and withdrawals at short n "the vacancies are usually filled without a long of delay and it has been possible to provide satisfa interim arrangements for the care of the pa Furthermore, the time taken by the Ministry to con

le appeals has been greatly reduced Under the onal Health Insurance scheme, a partnership t be recognised as such by an Insurance Com one partner's share was less than a third of e of any other partner No similar regulation made under the National Health Service, and iall but material percentage" of partnerships ill outside this definition ' may well prejudice iate of the true medical manpower in an area lermine the proper working of the allocation In other obvious respects such arrangements undesirable" It has been proposed that where erion is not satisfied the doctor should be treated, purpose of number of patients, as an assistant ig the year an experimental plan has been worked applying some of the money in the Special nent Fund to drawing doctors to the less attractive re heavily populated parts of a county area, and if ieme is successful it may be repeated elsewhere

EST NEWS OF THE PARTICLES IN MOUSE TUMOURS

essor Passey and his colleagues in Leeds are still ig the minute spherical bodies which they demon- t three years ago [1] in extracts of tumours, normal , and milk from strains of mice which are parti liable to cancer Two years ago [2] they obtained ut photographs of these particles by electron scopy and showed that their diameters ranged from 1200Å, with most of them about 300Å These s have since been fully recorded and extended [3] lete sedimentation of particles in 2 hours is attained e ultracentrifuge at a speed equivalent to 120,000 gravity The larger particles sedimented from able chicken tumours and from some mammalian urs have been compared with those found in high r-strain mouse tumours and there is little similarity eir behaviour

re of the biological tests, which are being performed correlate particle content with tumour-inducing city have matured, but they are a terribly long job idea of the patience required in biological testing be gathered from the fact that in one experiment ol mice have been kept alive up to 19 months e controls, which so delay the completion of the riments, are essential in establishing the infectivity herwise of the particles as a whole and in determining her any precise size range is associated with infec- y Up to now the tests have shown a good correlation een the presence of particles and the induction of mary tumours and this also indicates a correlation the presence of Bittner s agent The particles were nt or rare in mammary tumours induced with ivl cholanthrene in female mice, or with this carcino and œstrone in males, belonging to low-cancer, t-free strains [4] Extracts of these particle free ours produced a very few tumours in hybrid mice possible, however, that Bittner's agent was being ed by some of the hybrid mice used in the tests ulds [5] and others previously noted. Both electron scopy and biological tests showed that the milk the stomach of suckling mice of a high-cancer n was a good source of both particles [4] and agent [5] y of these studies are preparing the ground for ar physical examinations of human milk. Unfor- tely, owing to the species exclusiveness of most ur viruses biological tests on mice will probably be of any value in determining the presence or ice of these agents in human milk.

ading article Lancet, 1947 ii, 835
notation, Ibid. 1948 i, 915
ssey R. D., Dmochowski, L., Reed, R., Astbury W T Biophys Acta. 1950 4 291
nochowski, L., Orr J J Brit. J Cancer, 1949 3 529
ulds L. Ibid, 1947 1 262
nochowski L. Ibid 1949 3 525

DEAFNESS IN CHILDREN

THE parents of a deaf child are often bewildered and kept at strain because their doctor will not tell them point blank the unfavourable factors in the prognosis He may not make it clear, for instance, that congenital deafness, being associated with maldevelopment of some part of the auditory apparatus, is incurable Nor does he always reveal the hopeful factors in the case He may even omit to allay at the outset the common fear that the child will be permanently dumb, or to explain that deafness is rarely complete, and that even the grossly deaf child will learn to talk under the guidance of trained teachers And, having admitted that some types of congenital deafness are also hereditary, he may shirk direct questions about marriage and parenthood by mumbling that he really can't say

But the worst fear often troubling parents is that their child is mentally defective as well as deaf, and here again the doctor may be far from reassuring Indeed if he is not familiar with the progress to be expected of a congenitally deaf child the doctor himself may be deceived It is of great importance to the child that his intelligence—which, like that of other children, may be high or low but is usually average—should be assessed early, and that he should be treated according to his ability from the start, at any rate by all who know him In the course of his life he will again and again encounter those who fancy that because his speech is unusual his mental powers must be weak, but he will bear this embittering experience with equanimity if he has always lived among people who respect his intelligence

The Deaf Children's Society have lately published a pamphlet,[1] written for educated parents by a consultant otologist, which brings out these points very well. The author sets out the causes of deafness, mentioning biological failure in development, virus and syphilitic infection of the mother during pregnancy, middle and inner ear infections in the child, meningitis and the exanthemata, adenoids, sinusitis, and otosclerosis which is occasionally seen in childhood. He distinguishes briefly the types and degrees of deafness, gives some useful pointers towards diagnosis, and explains modern methods of testing The fact that deaf people are not dumb is printed in capitals Among preventive measures, he urges the expectant mother to avoid, as far as possible, contact with german measles and influenza, and parents to report their children's ear troubles early to the doctor, and to see that they don't go swimming when they have a cold On the question whether deaf people should marry and have children he says

' If the parents suffer from congenital deafness, there is certainly a risk of a deaf child, if the parents are otosclerotics there is a chance of deafness being propagated to future generations, with other forms of deafness no risk is involved. We have no proof that marriage of healthy relatives (consanguinity) produces deafness in their children.'

After making it clear that many forms of deafness are incurable he mentions the value of treatment in otitis media and chronic tonsillitis the enormous value of hearing aids and the good effects of early education and training

The little booklet contains much that parents of deaf children are hungry to learn It could have been simpler (terms like "Mendelian recessive character," and abnormality of the genes" crop up without warning or explanation) but it is singularly informative, and shows a thorough understanding of the parent's unspoken fears. It might well be followed by a sequel telling something of modern methods of educating the deaf.

DR. FRANK HOWITT has been elected master of the Society of Apothecaries

1 Medical Aspect of Deafness in Children. Obtainable from the Society 105 Gower Street, London, W C 1.

In England Now

A Running Commentary by Peripatetic Correspondents

YESTERDAY I came across a Registrar, curled up into a small ball in a corner of our hospital He was sniffling and chewing the frayed ends of his shirt cuffs His future, and the future of Registrars as a group, remains grim and uncertain, and I suggest that the following measures be applied immediately to lighten their gloom

First, let the term Registrar be dropped from medical usage, the more suitable title of Consultoid will better support the tottering group Id in the struggle of the years ahead The grading of a Consultoid should present no difficulty starting as a Weeny one, he will be promoted through the ranks of Slight, Small, and Big, becoming finally an Eversobig Consultoid in the phase preceding his full maturity

Secondly, commensurate with this promotion, let there be rules of dress which must be followed, to give him yet further support and uplift The weeniest the Consultoid the more immaculate should be his costume, so he will start in a black coat and spongebag trousers, with a white paper collar but by the time he reaches seniority he will be wearing an off royal blue suit, brown shoes, and a sacking shirt with soft collar (undone) attached

For something must be done to prevent Registrars from curling up in corners It looks so untidy

* * *

For once a congress really has opened in a blaze of glory A few hours before the opening reception the Church of Our Saviour in Copenhagen, one of that charming city's most charming landmarks, caught fire Tragedy was averted only because two energetic physiologists from North Britain, one an eminent professor, were climbing the tower soon after the fire began They came on it in an upper room of the tower Without a thought for personal danger one rushed for the fire brigade The other, more practically minded, put the fire out with a supply of water he carries round with him for such emergencies And fortunately, being interested in gastric function, he had spent his lunch-time investigating the properties of the products of the Carlsberg Foundation

They are now national heroes And England's prestige has received a boost which has almost counterbalanced the somewhat gloomy view taken by the Danes, as salesmen, of the visit of our Food Minister

* * *

Human occupations may be divided broadly into two groups first, small and select, the Those-you-send-for's, which include plumbers, doctors, vets, and on rare occasions parsons and undertakers, secondly, the Those you go to's, comprising shopkeepers, lawyers, civil servants, the teaching profession, editors, actuaries, bankers, farmers, and a hundred others The question arises whether it is better to belong to the former obviously more socially important group or whether one pays too high a price for this enhanced prestige I must have a word about it with the plumber

* * *

The new admission turned out to be an elderly paranoid troubled with electricity which comes down from the sky like two sparks" and gives her the cramp The interview included the usual simple questions to test her school and general knowledge and intelligence Silence or "I don't know" was the monotonous response to the school questions, in arithmetic and history we drew complete blanks Then we got to geography—naming of capitals of countries This was dull, too, till we got near home '*Capital of England? America, of course? That's the trouble, isn't it?*"—School and general knowledge defective, but intelligence? I wonder

* * *

Political theory
Is bogus and dreary,
Unlovely,
Not good,
And untrue
That's why Conservatives make me see red
And Socialists make me feel blue

Letters to the Editor

ACCURACY IN RED-CELL COUNTS

SIR—Your leading article of July 15 and the from Dr Jennings in your issue of Aug 5, make that a rational approach to blood counting will be possible, but there are many points on pathologists will disagree

First, the use of the colour index This measure of the average mass of hæmoglobin in cell, but since it is based on assumed average values which vary between the sexes, with age, and geographical location, it should be replaced by mean corpuscular hæmoglobin (M C H), which is independent of sex and location Even this two independent variables—cell volume and the globin concentration within the cell For di these two independent variables must be e The second of these is easily and precisely from hæmoglobin and hæmatocrit determination measurements of cell volume are much less Although in the diagnosis of pernicious anæmia measurement of cell diameter is useful, it is by no absolutely reliable, for I have seen several other of anæmia which show very similar patterns. There can be no doubt that the only reliable procedure diagnosis is to estimate cell volume and hæm concentration as accurately as possible, and then examine the stained film with the greatest care stained film, though usually reliable, can be misleading owing to alterations in the stain

Second, the use of capillary blood Peterson Strangeways have shown that although the coeff of variation of sampling from the finger is only occasional differences up to 10% occur, and I find differences of 5% between successive drops of blood common For diagnosis, therefore, it is essential obtain a sample of blood which can be well mixed sub sampling, and this is best done by using blood according to the Wintrobe technique Ev diurnal variations of 7% in absolute levels may place, but these diurnal variations will not affe size of cells or their hæmoglobin content and will not interfere with diagnosis

Despite Dr Campbell's example (July 20, p the possible errors in counting are enormous A h cytometer certified to comply with British Stand specification no 748 has a tolerance of ±5%, an pipette ±3% The error of enumeration varies bet 3% and 7% according to the density of cell suspen and then the innumerable personal variations an problem of random sampling have to be con During the last two years I and one assistant performed 317 counts on healthy men in such a w to eliminate any bias, the hæmoglobin estimation standard deviation less than 2% and app 500 cells were counted in each case The colour and M C H were as follows

Colour-index	Frequency	M C H (γγ)
0 80–0 849	6	23 8–25-09
0 85–0 899	7	25 1–26-69
0 90–0 949	61	26 7–28-09
0 95–0 999	57	28 1–29 59
1 00–1 049	78	29 6–31-09
1 05–1 099	62	31 1–32-49
1 10–1 149	28	32 6–34 09
1 15–1 199	12	34 1–35 79
1 20–1 249	4	35 8–36 99
1 25–1 299	2	37 0–38-69
	317	

Analysis shows that the distribution departs from normality, while nearly a quarter of the c

1 Bocage A Sang 1934, 8 10–5

sults greater or less than the generally accepted normal M C H

ems obvious that some considerable change in ie is necessary If the number of calibrations reduced and the measurements either simplified e fewer, then accuracy should improve and with chance which may be placed on the count Both ford instrument and that made by Metropolitan satisfy these needs In the former the chamber led and the critical calibrations are cell depth and io of two apertures in the eyepiece, in the latter ial calibrated apparatus is needed It seems that er case Bürker's technique should be used—that od should be measured in a capillary pipette, ed into a volume of fluid measured by an automatic e, and a drop transferred into the chamber of the l apparatus or an aliquot measured into the politan Vickers machine Such a simplification hnique is almost revolutionary, and since to this fication is added a reduction in the sampling error, only hope that the machines will soon go into ction

l-cell counts may be unnecessary in diagnosis, but are very useful, particularly in assessing the results eatment, and in some problems which are more gical than medical, such as the supervision of X ray adium workers

ntral Middlesex Hospital, London N W 10 GEORGE DISCOMBE

ARPERAL URÆMIA DUE TO ACUTE UPPER-NEPHRON NEPHROSIS

R,—The acute upper nephron nephrosis described our issue of July 22 by Dr Govan and Dr Mac vray recalls some histological findings seen occasion in cases of "crush syndrome" during the war was established in those particular instances that rose had been given to induce diuresis, and in view of close similarity to the renal appearances after sucrose inistration[1] we dismissed such findings as coincidental tended to mask more important renal pathological nges In two of the three Glasgow cases it is recorded t sucrose had been given, and it seems possible that upper nephron nephrosis is, in fact, merely a sucrose ct It would be interesting to know how certainly rose administration could be excluded in the first of three cases

anadian Red Cross Memorial Hospital, Taplow Bucks E G L BYWATERS

IR,—Dr Govan and Dr MacGillivray (July 22) cribe an "upper nephron nephrosis" in addition to the epted "lower nephron nephrosis" of acute renal ure due to a variety of causes From their very full e records, however, it seems that this new syndrome indeed the effect of treatment Firstly, all three cases e extremely shocked, secondly, two at least received tuitrin.' Of these two factors, one would lower the od pressure, and the other, with its antidiuretic ct, would tend to lower the rate of urine formation rdly, all three cases were apparently overhydrated they exhibited, not uræmic symptoms necessarily, those of water intoxication, this is particularly anced by the finding of œdema of the brain in the case

hus the pathological picture was made up as follows shock, hæmorrhage, and the administration of nitrin, leading to hepatic and renal anoxia with sequent deleterious effects, and (2) overhydration hence water imbalance resulting in—to take one all but relevant instance—œdema of the cells of the t convoluted tubules, which having extracted fluid possibly salt from the glomerular filtrate were unable to pass the fluid by osmosis to an already overloaded circulation

It is now generally accepted that, after treatment of the shock and blood loss, fluid replacement should be regulated according to urinary output plus the invisible loss—i e, about 1000 ml daily—and including, of course, salt replacement where vomiting occurs In this way water intoxication can be avoided and the kidneys given a fair chance to recover, helped possibly by the sundry other means at our disposal

Peterborough D W BRACEY

SIGNIFICANCE OF THE DISCOVERY OF THE EFFECTS OF CORTISONE

SIR,—In his letter of Aug 12 Dr Eastwood states that Professor Pickering, in his lecture published in your issue of July 15, "did a public service by his strictures on the psychosomatic theory of disease" It is my opinion that both he and Professor Pickering have done a public service in illustrating how widespread is the failure in the medical profession to understand what is meant by psychosomatic medicine, and how great is the need to replace prevailing fantastic notions on the subject by more accurate comprehension

The term "psychosomatic medicine" refers primarily to a *method* of examination It signifies that a patient is examined physically (with all this implies) and then psychologically (with all this implies) When a physical approach is used in investigation we get one set of findings, and when a psychological approach is used we get another set of findings Each set of findings (or both) may provide us with guidance for action—that is, for practical therapeutics The omission of the psychosomatic approach is the reason for many unnecessary failures in medical practice and for the prolongation of much invalidism The term "psychosomatic" medicine refers also to the body of knowledge which has been, and is being, acquired by adopting this combined method of approach and acting in terms of that knowledge

There is no such *thing* as a psychosomatic disease It is, however, useful, especially perhaps to the epidemiologist, to adopt the *concept* of a "psychosomatic affection" in relation to those disease labels that cover cases in which the psychosomatic method of examination and treatment often proves highly relevant These disease labels include not only the various forms of neurosis but also many organic diseases, including peptic ulcer, fibrositis, rheumatoid arthritis, and chronic bronchitis—to name only a few From the standpoint of systematic medicine, these "psychosomatic affections" are distinguished from diseases in other broad ætiological categories (e g, the infectious diseases) by certain peculiarities from whose formulation the concept of a psychosomatic affection has been derived They include the following

(1) Examination of patients diagnosed with such disease labels shows a significant association between the emergence or recurrence of the bodily disturbance and the emotionally upsetting events or situations

(2) Persons with well marked obsessional tendencies seem to be particularly liable to develop psychosomatic *organic* disease

(3) There is a pronounced disproportion in the sex incidence of these disorders

(4) The person who develops one psychosomatic affection is liable to suffer either from a recurrence of that disease or from substituting affections which take its place

(5) There is a substantially higher incidence of such illnesses in parents and siblings of the patients than in the general population

(6) The course of the illness is phasic with periods of crudescence, intermission, and recurrence

(7) The incidence and prevalence of the psychosomatic affections is related to changes in the communal environment considered psychologically and socially

It will be noted that the concept of a psychosomatic affection bears certain resemblances to Selye's concept of diseases of adaptation or stress diseases In Western

[1] Anderson W A. D Bethea W R *J Amer med Ass* 1940 114 1983

civilisation the commonest forms of stress, however, are not those of extremes of heat or cold or malnutrition or fatigue but emotional, and these stresses are attended by dysfunction of the autonomic and endocrine mechanisms which may take a great variety of forms

Far from exposing the fallacies of "the psychosomatic theory of disease" (whatever that is) the discovery of the effects of 'Cortisone' on rheumatoid arthritis and other diseases is entirely in keeping with the knowledge of these affections gained by the application of the psychosomatic method

Glasgow J L HALLIDAY

ISOLATION OF POLIOMYELITIS CASES

SIR—I suggest that the time has come to reconsider our policy with regard to the isolation of cases of poliomyelitis It is now generally accepted that the great majority of cases are undiagnosed but are just as capable of spreading the disease as the recognised cases with meningeal inflammation or paralysis

Thus, recently I saw a child with meningeal signs and a pleocytosis in the cerebrospinal fluid, within three days she was perfectly well There was a history that her brother had had an exactly similar illness two weeks before, and her sister the day before, but neither had undergone lumbar puncture and both had recovered As both these patients were still at home I could conceive no advantage from isolating my patient for three weeks nevertheless this was done, with the attendant wastage of beds and nursing staff

Even worse, perhaps, was the case of a district nurse who assisted a practitioner with the lumbar puncture in a case of poliomyelitis Because she had been in contact, she was instructed to cease her duties for three weeks Surely by now we should allow reason rather than prejudice to dictate our actions, and realise that isolation of poliomyelitis cases serves no useful purpose in preventing the spread of the disease

Exeter N S ALCOCK

ACQUIRED SENSITIVITY TO SODIUM P.A S

SIR,—Dr Cuthbert's article of Aug 5 prompts us to send this note on a case very similar to though less severe than that reported by him

The patient was a single woman, aged 22, who had tuberculous disease with cavitation in the upper lobes of both lungs She was treated with a long period of bed rest, and on Aug 8, 1949 a course of sodium P.A S (20 g a day in divided doses for 6 days a week) was started No nausea or vomiting was noticed in the first weeks of the treatment

On Aug 30 the patient's temperature rose suddenly to 104°F, and she complained of stiffness of the neck The cervical glands were found to be enlarged and tender, and the body was covered by a fine red macular rash During the next few days the temperature varied from 99° to 102°F, the rash became more pronounced and was intensely irritating

On Sept 5, in addition to the macular rash, which at all times respected the flexor aspects of the knee and elbow, numerous urticarial weals were seen on the body On this day jaundice was first manifest, and bile was found in the urine At no time was there any albuminuria

By Sept 10, the jaundice was no longer apparent, the rash had faded, and a fine desquamation had started

On Sept 12, the patient was afebrile and the skin had cleared There was no previous history of sensitivity to salicylates There were no known cases of epidemic jaundice in the neighbourhood at this time The agglutination reactions for *Leptospira icterohæmorrhagiæ* and *L canicola* were negative in all dilutions Blood culture taken at the height of the fever was sterile The total white cell count was 8600 per c mm with an eosinophilia of 9%

The administration of sodium P A S was stopped on the first appearance of the rash The patient was given ephedrine hydrochloride gr ½ b i d for two days, and thereafter 'Benadryl' was exhibited until the rash began to fade

Pinewood Sanatorium, Wokingham Berkshire A B A SCOTT JOHN J MCCANN

Obituary

WALTER JAMES DILLING

M B ABERD

Dr W J Dilling, professor of pharmacology general therapeutics at Liverpool University many years dean of the medical faculty, died on Aug while on holiday at Coniston

Born in 1886, in Aberdeen, he was educated at Gordon's College and Aberdeen University, graduated M B with honours in 1907 at the possible age of 21 After holding a Carnegie scholarship in physiology at Aberdeen he was appointed assistant to Kobert, who was then professor of pharmacology and physiological chemistry at Rostock. The following year Dilling returned to Aberdeen as lecturer in pharmacology, and he held this post until his appointment in 1914 to the newly established Pollok lectureship in materia medica and pharmacology at Glasgow His work there was interrupted in 1915 by war service, and in 1920, soon after his return to civilian life, he went to Liverpool as lecturer in pharmacology and therapeutics, later becoming professor in these subjects

Liverpool Daily Post

Dilling acquired a great reputation by his textbooks At a very early age he edited Bruce's *Textbook of Materia Medica* and he later became the sole contributor *Bruce and Dilling* was well known to a generation of medical students as a sound and complete textbook on the subjects of pharmacology, materia medica, and general therapeutics, and was so popular that it reached the 18th edition in 1944 His volume on *Dental Materia Medica, Pharmacology and Therapeutics*, written in association with S Hallam, reached its third edition 1946

A colleague on the General Medical Council, to Dilling was nominated in 1938, writes "Prof Dilling's reputation lay more in his great skill as a writer of books than in his contributions to experimental pharmacology His encyclopædic knowledge of the subject was of immense benefit to the various public bodies with which he was associated As Privy Council representative on the council of the Pharmaceutical Society he did splendid work, and it was hoped when he was elected to the chairmanship of the Pharmacopœia Committee of the General Medical Council in May last that he would have rendered the same great service in a new sphere Those who know most of his work and worth will appreciate what the medical profession have lost in this great expert in the use of drugs"

From 1922 to 1933 and again during the difficult years of the late war he was dean of the medical faculty and he was also twice a member of the university council His period of deanship was comparatively tranquil for at heart he was a peacemaker He regarded it as an opportunity for studying the needs of his students and for further self-sacrifice in their interests Thus as the number of his students doubled, he doubled his lectures and he provided a corner in his small laboratory where the musically minded could meet in the lunch hour Music was always one of his chief interests, and he also founded the Musical Society and linked the students with Philharmonic concerts He encouraged Liverpool to rebuild the blitzed concert hall and he became chairman of the Philharmonic Society at the opening of the new building

During the late war Dilling, with his friend Mr A A Gemmell, organised the student stretcher bearers who met the ambulance trains and unloaded them Cold dreary midnight watches and alarms often made the work heavy for the young students who included his own daughters, but it was cheerfully performed under his leadership Ill health followed these years of strain and periods of physical rest became necessary to him but he continued to edit his books, delight his visitors and start work again as soon as possible to the consternation of his colleagues and

writes ' Dilling was a likeable man, approach-
id knowledgeable in subjects far removed from
ology A true professor unostentatious and
, deeply imbued with the spirit of the Scots dominie,
proud of his pupils and keen to see them get
ist reward He endeared himself to the students
his colleagues and their children, for amidst
intless files on drugs, their uses and abuses, in his
home or in the university there was always
ing to appeal to the curiosity of all ages—the
sects under the bell jar, the idols from Egypt
w where flint axes of the Stone Age could be found,
ees most likely to be struck by lightning, the
s and the butterflies and how to mount them,
shions of the eighteenth century, the colour process
andpainting of flowers, the meaning of girdles and
alue of sixpence in a secondhand bookshop Not
consultations in his office concerned pharmacology
hey were always of value, for the information
would be accurate, often spontaneous, more often
ed and confirmed by several pages in his own
writing with quotations to support or correct his
on"

1914 Professor Dilling married Miss Vida Ducat
urvives him with two daughters

BERNARD JOSEPH WARD

F.R C S

r Bernard Ward, formerly senior surgeon of the
en Elizabeth Hospital, Birmingham died at his
e at Shelsley Beauchamp on June 30, at the age
1

he son of the late Dr Joseph Ward, who practised
many years in Birmingham he was a student at
mingham Medical School and the London Hospital
er qualifying in 1902, he held resident posts at the
een's Hospital Birmingham, and in London at St
er s Hospital for Stone In 1905 he took his F R C S
l settled in consultant practice in Birmingham
o years later he was appointed assistant surgeon to
Queen's Hospital He also joined the staff of the
ildren s Hospital. He served the medical school as
turer and examiner in surgery He achieved his
atest reputation in urology he was president of the
tion of urology of the Royal Society of Medicine and
en he died was vice president of the British
sociation of Urological Surgeons To commemorate this
t office he presented the Ward medal which is offered
outstanding work in urology

A colleague writes ' Although Ward hated publicity,
earned for himself an international reputation
owever, it will be by his hospital colleagues and assistants
at he will be most missed To those who met him
sually he sometimes appeared brusque and even short-
mpered this outer roughness shielded a nature of
eat gentleness and kindness

' He sometimes appeared to be vague about his
atients and occasionally even about his staff One
uickly learnt that this was a cloak, covering an accurate
nowledge of their illnesses, their personalities, and their
bilities which was assumed so that his assistants could
their best without any interference from him He
ways spotted the omission of any essential at once and
ought it to our notice by some devious method that
ould make us think that we had thought of it ourselves
was this generous side of his nature that turned those
o worked for him into his devoted admirers

" As a clinician he was first-rate, out of his vast
perience he seemed to have developed an instinct for
e abnormal, which depended on acute observation and
ability to see fundamentals unobscured by complica-
ons This lucidity was characteristic of his whole life—
s operating, his thoughts and his actions His clarity
mind made it difficult for him to tolerate fools, and
ough he learnt to control his feelings we learned that
e answer silent' usually meant someone had said
mething silly and sent us away to reflect upon it Of
s many kindnesses few knew anything He would take
dless trouble to disguise them and any attempt at
anks was usually met with an almost shamefaced
mial.'

Mr Ward leaves a widow formerly Miss Olga Bates,
Edgbaston and a daughter and two sons

Notes and News

REPORT ON TOXICITY TESTS

In his admirable study[1] of the methods of testing the toxicity of drugs Dr W L M Perry has tried not to overburden the reader with statistical theory His aim has been to help those whose mathematics is too weak to cope with detailed discussions of this subject and he has succeeded He first examines assay by quantal (all-or none) response and then assay by graded response emphasising that each test should be self-contained should contain no arbitrary assumptions and should provide an estimate of its own error He goes on to evaluate the current test designs on this principle In a last section he describes toxicity tests depending on the measurement of survival time, which have the great advantage of needing fewer animals than those based on quantal response

ION-EXCHANGE RESINS

The synthetic resins, whose medical applications were discussed in a leading article on Aug 12 (p 258), are mainly being used in two forms (1) anion-exchange resins for removing acids, such as gastric HCl from solutions and (2) cation-exchange resins for controlling the concentration of sodium chloride in solutions particularly in the intestine or in milk and other foods before ingestion. The Permutit Co Ltd[2] inform us that they can supply both types of resin for experimental purposes Their anion exchange resin, 'De Acidite E,' has an acid absorption capacity of 4 m eq per (dry) gramme and is supplied in coarse granules which may require crushing before use Their cation-exchange resin, 'Zeo Karb 225,' has a hydrogen ion exchange value of 2 5 m eq per (dry) gramme and is also supplied in granules *Neither of these resins seems to be at all toxic to man*

The apparatus for purifying sea water, mentioned in the same article, was described by Akeroyd et al[3] nearly five years ago

THE ARTIST AND THE ID

' Open wide the mind s cage-door ' This is Miss Joanna Field s aim and in her third book— ' On Not Being Able to Paint '[4]—she sets out to show how it can be done by ' free drawing " She draws she says, without any conscious intention to draw something Applying psycho analytical principles to the results she comes to conclusions about herself, about the nature of art and about ' living and education What she discovers about herself is not, of course of general application, but shows she has got a technique for reaching that inner life which so many of us succeed in concealing from ourselves But it is not easy to grasp just what she is saying about art It is an explanation on psycho analytical lines of the artist s heightened sensibility and intensity of feeling About living and education her point is that we err in over valuing the intellect and undervaluing the emotions The book contains material which should be of value to the psychotherapist, but one cannot help regretting that Miss Field has not written it with a more conscious intention to say what she means

University of Cambridge

On Aug 5 the following degrees were conferred

M.D—J G Benstead *J R Handforth G F Roberts A J Rook.

M.B B Chir—*M. S Aldridge *Mark Binnie *D R Bowsher *H H Broadhead *J M. Brown *P B Brown, *Denys Butcher J S W Chambers *A C Chovil *J E Dalby J W B Dalgleish *T D W Davies *H B Eckstein, *M. L E Espir *P R Gittins, *Hugh de Glanville *J R Gough *K. W Gray K. E Halnan *G E Heald *J M. Hodson, *R P Holmes *T M Howell *H F Juckes, P G A. Irvine Mary E Kendrew Frances E Kirk, *Kenneth Last *C R Leeson *T S Leeson Dora W Lemmon Jane Lodwick *J S McCormick, *Edward Marley H M. Michaelson, J L Milligan, *R D Montgomery, B J Muir A D Muirhead M. J D Newman *R. H Oram *M. J Peel, *G N St.J Penney Joan K. Perkins *S T Pickles *R B Prowse D R Pugh *J N Redfern Alison M. Richardson, *M. G Rinsler *C .R. Robinson J H Ross *T B Scott *J B Spargo *P G I Stovin *D R Sweetnam *Elizabeth R Taylor *Ronald Thomas, *P R V Tomson, A C Townsend *S E Trickey *A G Wallace *W J Wigfield, *J P Williams, *P L Williams *P O Williams *Verity G Wills

M.B—*G A. Mandow

* * * By proxy

1 *Spec Rep Ser med Res Coun Lond* no 270 H.M. Stationery Office 1950 Pp 50 1s. 6d
2 Address Permutit House, Gunnersbury Avenue London W 4
3 Akeroyd, E I. Holmes E L Klein A *Wat & Wat Engng* October 1945 *J Soc. chem Ind* 1946 65 28
4 London Heinemann 1950 Pp 173 10s 6d

Society of Apothecaries of London

At a recent meeting of the Court of Assistants, with Mr Duncan Fitzwilliams, the master, in the chair, Dr Frank Howitt was elected master from Aug 23 Dr G Roche Lynch and Sir Wilson Jameson were elected wardens The honorary diploma of mastery of midwifery was conferred upon Dr Hugh F Powell

The following were clothed with the livery of the society

H A Treble, Sir Lionel Whitby E Grey Turner P C Alexander, R M Maher G P West Lord Amulree A J Wrigley, B H Hogben Rev M F Foxell G F Keatinge, Guy Blackburn

The following were admitted to the freedom of the society by redemption

B E Schlesinger P L Blaxter Sir Arnold Stott F P Lee Lander A M Hutton P J Helliwell J J Keevil Donough O Brien, T S Leedham, G A Mason J W McLaren, R Bodley Scott J F Dow Terence East N L M. MacManus

The following were sworn in as examiners Guy Blackburn (surgery) H C Stewart (materia medica and pharmacology), and R V Lloyd (practical section of the assistant's examination)

The following were granted the diploma of L M S S A upon examination

P A Van Der Merwe A H R Hewett Clarke W B Wright, P F E Kann M K Mangan M. el K A Tarshouby L Tippett C E Law A J Rowe W C Snock H C Killey N L Rowe D G Bluett D L Hadley, T G Scott R A Davidson W H Bexon A Gordon P H I Parsons B Kay, R N Pearson J M Hayman G T Gould R E Hazell

Edinburgh Post-Graduate Board for Medicine

On Friday, Sept 8, at 4 30 P M, in the anatomy lecture-theatre of the university Dr W D M Paton will speak on the Paralysis of Autonomic Ganglia

Exhibition of Photography at Manchester

The International Exhibition of Medical Photography, sponsored by the Royal Photographic Society, which was recently shown in London, will be in Manchester from Oct 9 to 14, in the museum of the Royal Infirmary The exhibition will be officially opened at 11 30 A M on Saturday, Oct 7, by Mr R L Newell dean of postgraduate medical studies in the University of Manchester

U S Need of Service Doctors

In the United States all the Services are short of doctors, and the department of defence is seeking authority to call up doctors under 46 years of age even though they are not on the Reserves Mr Louis Johnson, secretary of defence, has said that unless such action is taken "substantial numbers" of doctors of all military grades who served long tours of duty in the late war are likely to be called up The *New York Times* (Aug 26) reports that the department s proposals are aimed particularly at the thousands of doctors who received their medical training in the late war at the expense of the Army or Navy but are now under no obligation to serve Under a Bill sponsored by the defence department, the first doctors to be called up would include this group, and also those whose service was deferred during the late war for them to continue their education and those who had done less than 90 days' active duty in the Armed Forces The Bill would also apply to dentists

Health Committee of Brussels Treaty Powers

The sixth session of this committee is to be held in St Andrew s House, Edinburgh, from Sept 7 to 9, under the chairmanship of Sir Andrew Davidson chief medical officer of the Department of Health for Scotland The committee was set up by the governments of Belgium France, Luxembourg, the Netherlands and the United Kingdom to look into the development on corresponding lines of health services in these countries and is composed of experts of the five countries in the field of public health Some of the subjects to be considered at this session are the comparison of medical education in the five countries, the exchange of medical and auxiliary medical personnel, the protection in war time of the civil population from a health point of view and the standardisation of blood transfusion apparatus The following will represent the United Kingdom at Edinburgh Mr R G Forrest assistant secretary, Department of Health for Scotland, Dr R J Peters, deputy chief medical officer, Department of Health for Scotland Mr W H Boucher, assistant secretary, Ministry of Health Dr N M Goodman senior medical officer, Ministry of Health and Dr J Boyd chief medical officer of the ministry of health and local government, Belfast

Westminster Medical School

On Monday, Oct 2, at 3 P M, at Church Hou Smith Street, London, S W 1, Sir Cecil Wakely will deliver the inaugural address for the next ses

American College of Chest Physicians

This college offers each year a prize of $250 for t original contribution, preferably by a young m on any phase relating to chest disease The prize is contestants living in other countries as well as th States Further particulars may be had from the e office of the college, 500, North Dearborn Street, Ch Ill The closing date for entries for the 1951 April 1, 1951

Nuffield Fellowships for Ceylon, India, and Pak

The Nuffield Foundation is extending the travelling fellowships scheme—already in operat Australia, Canada, South Africa, and New Zealand— new Dominions of Ceylon, India and Pakistan. will be appointed by the foundation on the recomm of an advisory committee in each Dominion Each fell will be of one year's duration, and—according to the holder is married or single—will be of value betwe and £890 Travelling expenses to and from the Kingdom will also be paid In the first year the fel fellowships will be awarded Ceylon, one (in med India, five (two in medical sciences), Pakistan, three (not yet selected)

Prof W W C Nixon is leaving this month for a tour, sponsored by the Rockefeller Foundation, of teaching centres in the United States and Canada On he is delivering the DeLee lecture, at the Chicago L Hospital, on Uterine Action

CORRIGENDUM *Association of Clinical Patholog* the report of the meeting of the association (*Lancet* A p 254) the title of Dr Norah Schuster's presidential was Nec Silet Mors Leonardo da Vinci, at the time traditional visit to the medical school at Milan, cou have been more than 60 years of age

Appointments

DAVIES, DOREEN, M B Birm, D A anæsthetist, Shrewsbu of hospitals

DEACON A L, M B Birm F R C S E, M R C O G obstetri gynæcologist Mid Worcestershire South Worcester Dudley and Stourbridge groups of hospitals

EDWARDS C G, M B Birm D M R D radiologist Stoke group of hospitals

GLAZER PHILIP M B Lond D A anæsthetist United Hospitals

HECTOR JONES DAVID M R C S D M R D radiologist and superficial therapy departments Royal Masonic London

KITCHEN C H L M S S A D M R D radiologist South Hospital Management Committee

LAURIE ALEXANDER M B Glasg D P H asst. M O H deputy

MILLAR E L M., M D, M Sc Sheff D P H Birmingham

MILLS W G M B Birm F R C S M R C O G obstetri gynæcologist, Mid Worcestershire South Worcester Dudley and Stourbridge groups of hospitals

MORTON, R S M B E L R C P E asst venereologist Hu Halifax and Wakefield

NEWBOLD J C M A M B Camb, F R C S M R C O G ob and gynæcologist, Mid Worcestershire South Worce and Dudley and Stourbridge groups of hospitals

PENROSE J H M B Camb F R C S orthopædic Coventry group of hospitals

PULLAN J M. M A M CHIR Camb, F R C S surgeon St Thomas s Hospital London

RICHMOND MARY M B Glasg D A consultant an plastic surgery centre St Lawrence s Hospital Chep

ROLAND P E M B Lond F R C S E, D L O ear nose surgeon Coventry group of hospitals

WALKER W I M D Glasg M R A D Lpool D M R D as gist South West Durham Management Committee hospitals (Bishop Auckland) and Darlington group.

Local Treasury M O

BRUZAUD J D M R C S Derby

GODFREY MARK M R C S London E 14

GREGORY J C M R C S D OBST Hemel Hempstead

GUNN C L L R C P E Morpeth

MYLES J J T D M B N U I Northampton

NELSON JONES ARCHIBALD M D Lond M R C P S W 18

SMITH A L H M R C S D OBST Staines

WARD G L D S C M A M B Camb Leicester

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the past four months THE LANCET has been ed under difficulties caused by a dispute in the g industry in London These difficulties have duced it temporarily to vestigial proportions and ch regret the inconvenience thus caused to readers, outors, and advertisers On the hospital and vacancies which have been tabulated, our tisement Manager will gladly give fuller information nding applicants

Potassium Lack

chmicians respect for the electrolytes of the body grown slowly in the hundred years since CLAUDE ARD developed his concept of the *milieu intérieur* SYDNEY RINGER in his classical experiments at ersity College, London demonstrated the vital ice between sodium potassium, and calcium salts e fluids bathing the tissue cells At first the investi- rs' attention was focused on sodium, because of its onderance in the extracellular fluids and because iting diarrhœa and vomiting led mainly to a loss of ion Moreover the success of sodium chloride sions in cholera &c, coupled with the comforting wledge that the cells are full of potassium and the htening effects of intravenous injections of potassium, de clinicians reluctant to believe in lack of potassium a cause of trouble, except in very rare conditions such familial periodic paralysis

t is largely owing to the patient skill of DARROW and associates[1] in New York that the wider significance potassium in medicine and surgery is beginning to be ognised By analysing animal tissues and studying salt balance of infants with diarrhœa, they showed it large amounts of potassium had to be absorbed and s into the muscles before these infants could again be sed as normal Many other causes of potassium ficiency have since been established, including burns d other trauma hæmorrhage, and diabetic coma, stoperative vomiting pyloric stenosis, and intestinal struction Though WILKINSON and his associates at inburgh[2] report an increase in potassium excretion in first few days of normal recovery from operation rtial gastrectomy), it is in complicated surgical cases at lack of potassium should particularly be borne in nd, NADLER and his colleagues[3] suspect hypokalæmia any case of intestinal obstruction with protracted miting, and a serious lack is probable if the patient been treated by gastric suction or with infusions of ium chloride solution only The typical signs are ncid and feeble muscles, low blood pressure with a unding pulse, and a loud systolic precordial murmur e diagnosis can be proved by finding a serum potassium el below about 14 mg per 100 mL, but even with a me photometer, to speed up the estimations the latent riod of a biochemical department's synapses is often tressingly long In practice therefore, it may be ore convenient to rely on the rougher but reliable idance of the electrocardiogram, which shows a prolonged Q-T interval and lowering or inversion of the T wave In treatment potassium chloride or citrate can be given by mouth if this is practicable in doses of 2 g half hourly, 100-1000 ml of a 1 14% solution of the chloride can be injected intravenously, or 500 ml of this solution with an equal amount of sodium chloride can be given by hypodermoclysis The only absolute contra indication is poorly functioning kidneys but potassium salts are not a remedy to be lightly prescribed on the off chance of doing good

Many clinicians will be satisfied to recognise and cure their cases of potassium deficiency few of them are interested at the moment in the factors which control the physiological levels of potassium and of sodium in the cells or in the internal environment Yet these are the problems which investigators are facing today The old idea of the cell membrane, impermeable to the ions is giving place to a much more dynamic conception based on the expenditure of energy by the cell The equilibrium between ions in the cells and in their environment is a matter of cell metabolism and is modified by physiological activity, by the pH of the cell's surroundings and by hormones such as deoxycortone Ions undoubtedly pass freely into and out of respiring cells, often against a steep diffusion gradient[4], and water also may be forced out of an active cell so that the osmotic pressure inside it is steadily maintained above that of its surroundings[5]

Darrow D C *Bull N Y Acad Med* 1948 24 147 Darrow D C Pratt, E L, Flett J Gamble A H Wiese H F *Pediatrics* 1949 3 129
Wilkinson A W Billing B H Nagy G Stewart, C P *Lancet* July 22 1950 p 135
Nadler C S Bellet S, Gazes P C Steiger W A *J Lab clin Med* 1950 35 842
4 Dixon K C *Biochem J* 1949 44 187 Maizels M. *J Physiol* 1948, 108 247 Terner C Eggleston L V Krebs, H A. *Biochem J* 1950 47 139
5 Robinson J R 18th International Physiological Congress Copenhagen 1950 Abstracts of Communications p 415
6 Cmd 8009 H.M. Stationery Office Pp 27 9d

Annotations

CREMATION

As the result of submissions made by the Cremation Council of Great Britain the Home Secretary in 1947 set up an inter departmental committee with Mr H. A Strutt as chairman, to review the regulations made under the Cremation Act of 1902 Its report[6] shows that the number of cremations in this country rose from 1796 in 1920 to 79 607 last year Cremation authorities however have long been anxious to modify the legal and other handicaps placed upon cremation—handicaps framed at a time when cremation was not only unpopular but to some extent suspect The committee recommends that the statutory declaration required in conjunction with the form of application should be dispensed with—an easement long desired It thinks that the certificate on form B (that of the medical attendant) should be in more detail if the coroner has been consulted, or if there has been a necropsy or an operation within a year before death, these facts should be stated Its proposal that form C (the confirmatory certificate) should be retained runs counter to the hopes of the Cremation Council of Great Britain the Society of Medical Officers of Health and the Association of Municipal Corporations—bodies which considered this form a serious deterrent to the practice of cremation partly because of the complication introduced into the arrangements and partly because of the expense entailed In respect of the last point however it is suggested that the Secretary of State should be empowered to lay down maximum charges for both medical certificates

Speaking generally, the recommendations tend to eliminate the penalisation of cremation as against earth burial This will help to make the former an easier and more efficient public service than it is at present

CORTISONE AND A C T H

THE brilliant demonstration by Hench and his colleagues at the Mayo Clinic of the effects of 'Cortisone' or A C T H in rheumatoid arthritis has been developed so swiftly in the U S A that even the expert cannot be sure that his information is up to date With the purpose of bringing together pre vailing knowledge two conferences were held last autumn in the U S A and the proceedings have now been published verbatim[1] The reports give a good idea of the wide scope of the work done in six months or so These substances had been tried in the following array of disorders collagen diseases (rheumatic fever, rheumatoid arthritis, disseminated lupus periarteritis, dermatomyositis, and scleroderma), severe allergies (atopic dermatitis, drug sensitisation, hay fever asthma, nasal polyps), glomerulonephritis and nephrotic syndrome, gout, neoplastic diseases (carcinoma, Hodgkin's disease, chronic lymphatic and myeloid leukæmia and acute leukæmia), specific infectious diseases (pneumococcal and virus pneumonia, tuberculosis, poliomyelitis, chronic infectious hepatitis, and herpes), cirrhosis of the liver ulcerative colitis, pemphigus, hyperthyroidism, diseases of the central nervous system and of muscle (myasthenia gravis amyotrophic lateral sclerosis, muscular dystrophies disseminated sclerosis, and various psychoses), and congenital hypoglycæmia

This form of therapy is not hazard free Thus A C T H may give rise to defects in wound granulation, a rise in blood pressure possibly endangering life in hyperpietics, and a modified Cushing's syndrome characterised by 'moon face,' acne and even hyperglycæmia Mental changes have also been noted, often the patient has no more than an exaggerated sense of well being, but sometimes the picture is more serious One of Spies's[3] patients, for example, developed hallucinations, and agitated depression has been reported Hoefer and Glaser[4] have lately recorded significant electro encephalographic changes in 13 out of 15 patients treated, with psychiatric symptoms in 10

SERVICE WITH THE FORCES

LAST week's announcement that the Government are to seek Parliamentary sanction to prolong the period of compulsory national service from 18 months to 2 years will be particularly unwelcome to medical students, who from 1952 onwards may also have to spend a year in hospital appointments after qualifying before their names can appear on the Medical Register The longer period of service will underline the shortage of specialists in the Army[5], and it cannot offset the threatened serious dearth of general duty medical officers, due to the large proportion of ex-Servicemen among the newly qualified In one way, however, the Forces will gain a better medical service as anyone who has served with the R A M C will know it takes some 18 months to become a fully competent regimental medical officer, and now the Army will be retaining its doctors for an extra 6 months when they really know the ropes The all round increase in pay after the first 18 months of service, also announced for all the Forces last week does not apply to doctors, dentists and some others The negotiations on this subject which the British Medical Association has been conducting have been overtaken by the latest developments, but an announcement is expected very shortly

PERIL IN THE POT

Two sorts of infection beset man—those that cannot be prevented and those that can On the whole the first group have treated this generation gently and with improved preventive measures there has been gradual transfer from the inevitable to the preventable group Food poisoning is now certainly one of the preventable infections and yet it is steadily becoming more prevalent last year over 800 outbreaks were reported in England and Wales and the total seems likely to be more than doubled in 1950 The main causes of the increase—the growing popularity of communal feeding and of made up dishes—are as well known as the organisms which make us ill, and if the counter actions still fall short of the need this is probably because the illness rarely seldom disables for more than a few days At a meeting convened by the Central Council for Health Education London last week, Miss Betty Hobbs wondered if the modern practice of building the small kitchen on the south side of the house, often with a water heater kept at full blast, might not be at the root of some outbreaks This reversal of the previous tendency to put the kitchen in the basement and store the food in a cellar no doubt reflects a consideration for the housewife's comfort which was denied to domestic servants it may also be based on the assumption that everyone to have a refrigerator, which is not yet true even though it has nearly been attained in the U S.A. and No-one would advocate a return to basement kitchens it might not be a bad thing to ensure that larders are on the chillier northern aspect and to give more attention to cheap household methods of keeping food cool and from flies The risks of food poisoning may never be removed—sooner or later someone will fail in the routine—but let us at least be rid of outbreaks not to human fallibility

1 Proceedings of the First Clinical A C T H Conference Ed John R Mote London J & A Churchill Pp 607 42s
2 Adrenal Cortex Transactions of the First Conference, 1949 Ed. Elaine P Ralli New York Josiah Macy, jun Foundation Pp 189 $2
3 Spies T D et al *Lancet* Aug 12 1950 p 241
4 Hoefer P F A, Glaser G H *J Amer med Ass* 1950, 143 620

Dr G S GRAHAM SMITH, F R S, co-editor of the Jo *Hygiene* and emeritus reader in preventive medicine Ca University, died on Aug 30, aged 75

Dr ERNST LOEWENSTEIN, originator of the cultu that bears his name, died in San Francisco on Aug 29

In England Now

HE comes every week, but this morning even the k that announced his arrival was muted He had wa shadow of his normal self, and his buff overcoat was in limp folds On examination I found the cause superior part of the anterior editorial column

Next week he'll probably be brought in flat out have no doubt about the ultimate prognosis You reach the age of 127 without going through a few lean t and these tough old timers fill out again quickly

News

In the week ended Aug 26, notifications of poliomyeli England and Wales totalled 589 (paralytic 369 non paralytic Totals for the four previous weeks from that ended July that ended Aug 19, were 306 367 393, and 550

Over 1300 private chemists in Scotland have given three notice of intention to withdraw from the National Health They object to the 8% cut in their earnings lately imposed Secretary of State without arbitration

The North West Metropolitan Regional Hospital Boa asked management committees to aim at a 90% occupation hospital beds

At an inquest in Birkenhead on Aug 31 a verdict of acci death was returned on a 15 month-old girl who died after swal four tablets of an anti histamine drug Such preparation lately been added to part I of the Poisons List and the first sch

The dispute on salaries in the public health service is to be before an industrial court on Oct 9

Prof A Leyland Robinson will give the William M Fletcher Shaw lecture at the Royal College of Obstetricians Gynæcologists, on Sept 29 at 2 30 P M He is to speak Evolution of the Gynæcologist

Prof Lillian Penson vice chancellor of London Univer deliver an inaugural address to the Royal Free Hospital of Medicine on Friday Sept 29 at 3 P M at B.M A House

Sir Lionel Whitby will give the inaugural address at College Hospital Medical School on Friday Sept 29 at 3

The first success in an international search for group with the rare rhesus homozygous pattern cdE/cdE (Rh was reported on Sept 1 from Bristol The blood was nee a patient in St George s Hospital London

The first stage of the new Australian medical service dev Sir Earle Page, F R C S (see *Lancet* Aug 19 p 303) was intr on Sept 4 when 135 costly drugs were made available charge on presentation of a doctor's prescription

Mr T C Denston F R I C has been appointed secretary British Pharmacopœia Commission in succession to Dr Hampshire who will retire on Oct. 3

The first International Congress of Cardiology opened in last Sunday under the presidency of Sir John Parkinson nearly 1000 members from 32 countries

The fifth International Congress of Microbiologists be month in Rio de Janeiro with 697 members from 37 c decided that it is at present unwise to use a scientific nomen

ACADEMICAL AND EDUCATIONAL

ollege of Surgeons of England
i will elect 2 Examiners on Nov 9
(Fellows only) by Oct 2

Board in England Examinations
M.R D and D M R start on
1 and for F D S R C S on Oct 11

Institute of Public Health and
ne 28 Portland place, W 1
e for C.P H and D.I H (part 1)
on Oct. 6

Institute of Urology St Peter s Hosp, W C 2 Postgraduate course in V D, Oct 3–Nov 30 Fee 12 guineas (with application)

Guy s Hospital 2 Junior Pharmacology Lectureships Apply by Oct 4

Queensland Univ Senior Physiology Lectureship Apply Sec Assoc of Universities of Brit Commonwealth, 5 Gordon sq W C 1, by Oct 23

Maida Vale Hospital Neurological teaching session for postgraduates Oct 2–Dec 22 Clinical demonstrations every Friday from Oct 13–Dec. 15 at 5 P.M

Prophit Studentship in cancer research, £500 a year, plus expens for 1 year from Jan 1 1951 renewable Apply R C S, Lincoln s Inn fields W C 2, before Sept. 18

Aberdeen Univ Anatomy Lectureship Apply by Oct 2

LIST OF HOSPITAL VACANCIES

W.3 —Sr Surg Reg
Dock Orth & Frac, E 16 —H S

il Green E 2 —H O (A/B2) med
broke S W 11 —H P (B2) H.S

l Middlesex N W 10 —Sr Reg
s
g Cross (Northwood Unit) —H P (A)
nought Seamens S E 10 —H S (B2)
eth Garrett Anderson N W 1 —
st Asst (A/B2)
n H.M C N 11 —Psych Reg (B1)
am W 6 —H S (B2) cas
s & York Clinic S E 1 —Asst Phys
ych Med.
ipstead General N W 3 —Cas M O
2)
pital for Sick Children W C 1 —Jr
nes Reg (B1) H P (B1) H S (B1)
g Edward Memorial W 13 —Sr Reg
B1) Surg O
nbeth S E 11 —Jr Reg C O (B1)
r H P (B2)
visham (General) S E 13 —Anes Reg
B1)
ndon Jewish, E 1 —Sr R.M O (B1) H.S
ler General S E 10 —Anes (B2) 1st
H.S (B2) C O (B2)
stgraduate Med School W 12 —Reg
obst gyn.) H.P.s H.S s
nce of Wales s General N 15 —C O
B2)
yal Eye, S E 1 —Jr H.S (B2)
yal Cancer S W 3 —H S (B2)
Allege s S.E 10 —C O (B2)
Anne s General N 15 —H P (B2)
Charles W 10 —C O (B1) Jr Reg
George s S W 1 —Sr, Reg Neurolog
George s S W 1 —Regs (derm)
James s S W 12 —Jr Reg (B1)
orth. traum
t John s S E 13 —C O (A) H.S (B2)
t Leonard s N 1 —H.S (A/B2) H P
(A/B2)
t. Olave s S E.16 —Peg in Anes
outh Western, S W 9 —H.S (A/B2)
niversity College —Reg (radioth)
Provincial
bergele San.—Jr M.O.s (B2)
ilton Lord Mayor Treloar —Reg
ltrincham Gen —Asst Surg O (B2)
shford Middlesex.—H O (Male) anes
shton Hyde & Glossop H.M.C —Reg
(B1) chest dis & T B
shton Infy & Lake Hosp —Orth H.S
(A/B2)
shton n Lyne Dist. Infy —H.S (A/B2)
ylesbury Royal Bucks —H.S (B2)
obst gyn
lanstead Surrey Cuddington —H O
(A/B2)
larnet General —Jr Anes Reg
larrow in Furness North Lonsdale —H S
(A/B2)
Batley & District Gen.—H O (A/B2)
Bebington Clatterbridge Gen —Sr Reg
or Reg (B1) orth gen med. H.S
(A/B2) orth H O (A/B2)

Bedford Gen —H S (B2)
Billericay St Andrew s —Obst Reg (B1)
Billericay St Andrew s —H S (B2)
Birmingham Dudley Road Infy —Jr H M O (B1)
Birmingham Highcroft Hall Mental —Jr Reg (B1) H O s (A/B2)
Birmingham Hollymoor —Locum Reg
Birmingham Little Bromwich —Jr M O (A/B2)
Birmingham Maternity —H S (B2)
Birmingham R H B —Cons E N T Surg
Birmingham Rubery Hill —Reg (Male)
Bishop s Stortford Haymeads —H O (A/B2) med
Bolton Royal Infy —C O (A)
Bolton Townleys —H S (A/B2), Reg or Jr Reg (anes)
Bournemouth Christchurch —H P (A) H P (B2) Childs Beds
Bournemouth Royal Victoria —H S (B2) ophth E N T
Bowden St Anne s E N T —Jr E.N T Reg (B1)
Bradford Children s —H O (A B2) Female
Bradford St Luke s —H S s (A/B2) orth & ped
Braintree Black Notley —Reg (B1) pulmonary T B
Braintree Black Notley —Orth H O (A/B2) H P (A/B2)
Brentwood Mental —Tempy Reg in Psych. (B1)
Brighton & Lewes H.M C —2nd H S (A/B2) E N T
Bristol Frenchay —H.S (A/B2) neuro surg H S (A) plastic surg
Bristol United —Cons Ophth Surg Asst Radiol.
Bristol United & S Western R H B —Cons Genito urinary Surg
Bromley Orpington & Sevenoaks H.M.C s —Reg Phys Med
Bromsgrove All Saints —H S.s H P
Burnley General —H O (A) surg Jr E N T Reg (B1)
Burnley Victoria —H S Jr Ophth Reg., Orth H.S
Bury General.—C O (B2) H.S (A/B2)
Bury St Edmund s W Suffolk Gen.—H.S (B2) gyn obst
Cardiff United —Jr Med Reg
Carmarthen. W Wales Gen —H.S (A/B2)
Castleford Normanton & District —R S O (B1) Jr Reg
Chartham Down. St Augustine s —Jr M.O (B1)
Chelmsford & Essex & St. John s —H.S (B2)
Chelmsford St John s —H S (A/B2)
Chelmsford. St John s —Jr Med. Reg (B1)
Cheltenham Gen Eye & Children s —R M.O (B2)
Chester City Hosp & Roy Infy —Med Reg (B1) gen med & cardiac
Chester Royal Infirmary —Jr H M.O (B1) orth. cas
Chesterfield Royal.—C O (A/B2)
Chorley & District —Surg Jr Reg (B1)

Colchester Roy Eastern Counties —Sr Reg (B1) Jr H M O s
Coleshill Hall —Sr Reg (B1) Male
Cottingham Castle Hill —H O (B2)
Darlington Mem —C O (A/B2)
Davyhulme Park Hospital —Obst H O (A/B2) Med Reg (B1)
Dewsbury & Dist Gen. Infy —H S (A)
Dudley Guest Hospital —H S (A/B2) C O (A/B2)
East Grinstead Queen Victoria (Plastic) —H S (B2)
Eccles & Patricroft Hospital —H O (A/B2)
Edinburgh Eastern General —Jr Regs (thoracic)
Edinburgh Princess Margaret Rose —Cons Asst Orth Surg
Edinburgh Royal Infy —Cons Asst. Orth Surg
Enfield Chase Farm —Jr Anes (B2)
Epsom District —H O (A/B2) surg
Epsom Horton —H.P
Exeter Clinical Area S Western R H B —Deputy Med Supt
Gateshead Sherriff Hill I D —Med Reg (B1)
Great Yarmouth & Gorlestone Gen.—H.S (A)
Griffithstown County —Jr H M.O (obst. & gyn)
Grimsby General —H O (A/B2) orth H O (A B2) gen surg & ophth C O (B1) Sr Reg Locum C O (Jr Reg)
Guildford Royal Surrey County —Gyn H S (A/B2)
Halifax Area H M.C —H P
Halifax General —H S (B2)
Halifax Royal Infy —1st H.S (B2) Jr Reg cas & orth., H P (B2)
Harefield —Med Reg
Harrogate Royal Bath —R M.O (B2)
Hastings Group H M.C —Sr Surg Reg H O (A/B2) med Female
Haverfordwest Pembroke Cty War Mem —R.S O (B1) H S (A/B2)
Hemel Hempstead West Herts.—C O & H.S (A/B2)
Hertford County —C O & 2nd H P (A/B2) H.P (A/B2)
Heswall Cheshire Cleaver —Jr H.M O (B1)
High Wycombe War Mem —H.O (B2) surg Jr Surg Reg (B1)
Huddersfield Royal Infy —Radiol. Reg (B1) Jr Reg (B1) E N T Jr Reg (B1) cas.
Hull Royal Infy —Orth H.S (B2) E N T H.S (A/B2)
Hull Victoria Hosp Sick Children.—H P (A/B2)
Ilkley The Hospital —H.P
Ipswich Borough Gen.—H.S (A/B2) gyn & obst.
Ipswich E Suffolk & Ipswich —C O & Asst H.P (A/B2)
Ipswich. Sanatorium.—Tempy Med. Reg
Isleworth West Middlesex.—H O.s (A/B2) med maty & ped. H.S. (A/B2) surg Phys

Keighley Victoria—Cas & Orth H S (B2), Jr Reg (B1) gen surg
Kettering General—H S (A/B2), traum & orth
Leamington Warneford Gen—H S (B2) E N T & ophth H S (A)
Leeds R H B—Reg Blood Transf O
Leeds St James s—Anæs O (B1) Jr Reg Jr Reg (B1) orth
Liverpool City Hospital North—H O (A/B2)
Liverpool David Lewis Northern—Med Reg
Liverpool Newsham Gen—H P (A/B2) derm
Liverpool Royal Children s—H S (A/B2)
Liverpool Royal Infy—H S (A/B2) gyn
Liverpool Royal Southern—C O s (A/B2)
Liverpool United—H S s (orth)
Liverpool Walton—H P.s (A/B2)
Llanelly—Jr H M O s (gen surg & gyn med & anæs E N T & ophth)
Louth County Infirmary—H O (A/B2) surg H O (A/B2), anæs & gen
Luton Hitchin & Bedford Group H M C—Asst Chest Phys (B1) Sr Reg
Macclesfield Parkside—Psych Reg (B1)
Maidstone Barming Heath—H O s
Maidstone Lenham San—R M O Reg Locum
Maidstone West Kent Gen—C O (A) H S s (B2) H P s (B2)
Manchester Baguley Emergency—H O
Manchester Baguley (Thoracic Unit)—Surg Reg (B1)
Manchester R H B—Cons Asst Radiol
Manchester St Mary s—H P (B2) neo natal
Manchester United.—R M O (B1) Reg or Jr Reg Regs (diag radiol)
Manchester Withington—Path Reg (B1)
Mansfield & District Gen—Sr H S (B2) accid & orth H S (A/B2)
Neath General—Sr Reg (radiol)
Newcastle Hosp for Sick Children.—H S (B2)
Newcastle Roy Victoria Infy—Jr Surg Reg
Newcastle St Nicholas—Psych Reg (B1)
Newport Royal Gwent—H O (derm & V D)
Newport Royal Gwent—H O (A/B2) orth H O (A/B2) E N T & ophth
Northern Ireland Hosps Authy—Anæs (North Antrim)
Nottingham City—H S (A/B2) Jr Reg (B1), thor surg Paed H P (B2), H P (A/B2)
Nottingham Firs Maternity—Obst H S (B2)
Nottingham General—Jr Aural Reg Orth Reg (accid & orth) Aural H S (A) Orth. & Frac H S
Orpington—Jr Orth Reg (B1)
Oxford United—Med Reg Surg Reg
Peterborough Mem—H S (orth) H S (gen)
Pontyfract Gen Infy & The Hydes—R.S O (B1) Jr Reg H.P (A) H S (A)
Pontypridd Church Village Gen—Reg (diag X ray) H O (A) med Reg (surg) H O (B2) surg Reg (anæs)
Portsmouth Royal—H S (B2)
Portsmouth St Mary s—H S (A)
Potters Bar & District—H O (A/B2) med & surg
Preston Royal Infy—Anæs H O (B2) Jr Reg (B1) orth & traum Jr H O (A/B2) orth & traum
Rhondda Porth & District—Jr H M O (surg) H O (A), mainly surg
Rochdale Infy—C H S (A/B2)
Rochford General.—H S (A/B2)
St Leonard's on Sea Buchanan—H O (A/B2) phys
Salford H M C—E N T Reg
Salisbury General—H S (A/B2) H P (A/B2) Jr Reg (E N T)
Scotland Northern R H B—Sr Reg Anæs
Sheffield Children s Hosp Unit—H S s (A/B2)
Sheffield Middlewood—Jr H.M.O (B1), psych
Sheffield R H B—Asst Psych (Harmston Hall)
Sheffield R H B—Cons Orth Surg (Barnsley Rotherham)
Sheffield Royal Infy Unit—Sr Anæs Reg (B1)
Shrewsbury Roy Salop Infy—Orth H.S & C O (A/B2)
Shrewsbury Shelton Mental—Sr Psych Reg (B1)
Sidcup Queen Mary s—Jr Reg (B1) gen surg H S (B2)
Skipton The Hospital—H P
Southampton Borough General—H S (A/B2)
Southampton Children s—H O (A/B2)
South East Kent H M.C—Sr Reg Gen Med
Southend on Sea General—Reg (B1) diag X ray
Southend on Sea H M C—Asst Chest Phys (Sr Reg)
Staincliffe Gen—H P (A/B2) derm & gen Jr Reg Surg H O (A/B2) gen surg H P (A/B2) with paeds H O (obst & gyn)
Stamford & Rutland—C O & H P (A), H S (B2)
Stoke on Trent Bucknall Isolation—H O (B2)
Stoke on Trent Longton—H S (A)
Stoke on Trent N Staffs Roy Infy—Orth H S (A) Ophth H S (A)
Stoke on Trent Orthopædic—Orth H.S (A/B2)
Stourbridge Corbett—H P (A/B2) C O (A/B2)
Sutton & Cheam S W Met R H B.—Cons Path
Tilbury & Riverside Gen—Jr Reg (Tilbury)
Tilbury & Riverside Gen—H P (B2) Tilbury Obst H S (B2) Orsett
Tunbridge Wells District—Anæs (B2)
Uxbridge Group H M C—T B Reg (B1)
Ventnor I W Royal National—H P (B2)
Watford Shrodells—H P (A/B2)
West Bromwich & District Gen—Anæs & H S (A/B2)
West Bromwich Hallam—Biochem Asst
West Cornwall Clinical Area South Western R H B—Sr Med. Reg
Whiston County—Cas & Admiss O (B2)
Wigan Royal Albert Edward Infy—H S (A/B2)
Wigan & Leigh H.M.C—Radioding Reg
Winchester Royal Hants County—H P (A/B2) paeds Anæs (A/B2)
Woking Victoria—R M O (A)
Wolverhampton & Midland Counties Eye Infy—H S (B2)
Wolverhampton Royal—Sr C O (B1) Reg Jr C O (A/B2) Obst & Gyn Reg (B1) Sr Asst Biochem
Wrexham & E Denbighshire War H P (A/B2)
Wrexham Maelor—H.S.s (A/B2)
Wrexham Maelor Gen & War Jr Reg Anæs Inter Reg E. Surg Inter Reg Radiol.
York Friends Retreat—Jr Reg.
Fort Wayne St Joseph—Trainee in Path
Gisbourne New Zealand. Cost Board.—Anæs (Jr Spec or S
Melbourne Australia Victoria Eye Path
New Zealand Northland Hosp Radiol (Jr or Sr Specialist)

PUBLIC HEALTH

Aylesbury Stoke Manderville Dental Surg (B1)
Birmingham City Educ. Com'tee—Sch M.O
Board of Control Moss Side Hse Deputy Med Supt (Sr H.M O)
Board of Control Rampton Hse Jr Reg (Depy Med Supt), Cen
Crown Agents for the Colonies Gold Coast Agric Develop—Med O
Gloucestershire C C—Sr Asst Cons M.O H
Government of Iraq—Various Specialists
H M Colonial Research Service British Cameroons—Path
H.M Colonial Service Kenya—Mid M.O H s
H M. Colonial Service Malaya—Med Supt (Mental Hospital)
H M Colonial Service Somaliland—Med O (surgical)
Leeds City—A.M.O H
Liverpool City—Sr Asst M.O
London C C—Asst Med O (P H Dep.)
Middlesex C C—A.M O (Area 3 Hornsey & Tottenham)
Ministry/Pensions X ray Clinic Glasgow Visiting Cons Radiol
Ministry/Supply—Prin & Sr Scien O s (Male)
Oxfordshire C C—Deputy County M
Somerset C C—Asst County M O H.
Stoke on Trent City—Woman A.M (maty & child w)

LATE APPOINTMENTS

Cambridge Addenbrooke s—H S (B otolaryngol
Cambridge Papworth San—H.P (B2)
Hull No 5 H.M C—Reg (B1) radiogr
Leeds Meanwood Park Colony—P Med Supt
Northampton Gen—Sr Anæs Reg (B1)
Norwich W Norwich & Loddon H P (A/B2)
Birmingham City—A M O H (gen purposes)
Tyrone County Health Committ County M O H

GENERAL PRACTICE

(Executive Councils Form L.C 11)
Cardiganshire Crosswood/Llanilar—List 510
Halifax—Urban List 3275
Yorkshire West Riding Chapelthorpe Wakefield—Chiefly Rural List 3301
Yorkshire, West Riding Castleford—Urban List 600
Strathblane Scotland—Rural List 19

Notices of vacancies will appear in this form (without charge) until normal publication can be resumed

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we go to press it seems likely that this journal will e its usual appearance next week As soon as ng conditions become normal we shall do our best ake up for the delays in publication during the few months Meanwhile we are grateful to our ibutors and advertisers for the forbearance every of them has shown, and we must also (though with 'ly mixed feelings) thank those readers who have ssed themselves as wholly satisfied with the few s we have been able to offer

After Gastrectomy

HOUGH the results of gastrectomy vary, it would bably be fair to say that 95% of patients survive the ration, 75% are relieved of their old symptoms hout acquiring new ones that bother them, and 20% re further symptoms due either to recurrent ulceration 4%) or to disturbance of alimentary function casionally the functional disturbance is severe thus lector who wrote in our Disabilities series said that he had known about the attacks of extreme lassitude ich were to follow his gastrectomy he would rather ve kept his ulcer and borne its pain [1]

MUIR[2] finds that, next to the much debated dumping ndrome, the commonest postoperative trouble is ilure to gain weight Six months after gastrectomy, ore than 40% of the 86 patients he investigated had st half a stone of their preoperative weight, and some ad lost much more Often it was clear that this loss as due to "dumping", the patients ate small meals to void discomfort But in 7 cases there was no obvious ason, and 5 of these were found to have steatorrhœa ctually, it is remarkable how many patients after astrectomy "go off" fats, often finding that milk, specially if creamy, gives them diarrhœa The causes of their disordered fat absorption seem to be much the ame as those of dumping symptoms The small intestine, faced with a rush of unpeptonised food, must attempt a hurried job of digestion and absorption for which it was not designed—it normally has its material doled out in small quantities Moreover, the popular Billroth II type of operation may interfere with the free flow of bile and pancreatic juice Its most usual variant requires the attachment of the afferent loop to the lesser curvature of the gastric stump, and at this point the afferent loop is kinked and may become partly obstructed. Then, in the words of MIMPRISS and BIRT,[3] "the meal may empty rapidly down the jejunum, although the bile and pancreatic juice are detained at the upper end of the intestinal tract" The effect of this on fat absorption is obvious, and its probability is underlined by those patients whose dumping syndrome is accompanied by vomiting of bilious fluid, unmixed with food, shortly after a meal. That gastrectomy may have yet more subtle effects on the biliary system (and therefore on fat absorption) is suggested by MAJOOR and SUREN'S[4] observation on the appearance of gall stones after gastric resection As MUIR remarks, further investigation of abnormalities in fat metabolism after gastrectomy is obviously needed.

1. *Lancet* 1949 ii 907
2. Muir A. *Brit J Surg* 1949 37 165
3. Mimpriss, T W Birt St J M. C *Brit med J* 1948 ii 1905
4. Majoor C L H. Suren, Th. J J *Ibid*, 1947 ii 8

While this evidence is accumulating, certain provisional measures seem likely to help Most surgeons probably believe that in the Billroth II type of operation the afferent loop should still be attached to the lesser curvature of the gastric stump, so as to discourage filling of this loop and hence reduce one cause of dumping But the higher the gastrectomy with this anastomosis the more acute will be the kinking of the afferent loop and the greater the likelihood of its retaining bile and pancreatic juice, and there are therefore advantages in a gastrectomy less radical than a subtotal removal. A further reason for preferring a two thirds excision of the stomach to a more extensive ablation is that the gastric stump holds more food On the debit side must be reckoned the higher incidence of recurrent stomal or jejunal ulceration The late HEDLEY VISICK[5] reduced this complication to nil by his very radical operation, but his paper did not give details of the frequency and seriousness of postoperative dumping and weight loss, nor would his methods necessarily be so successful in the hands of surgeons without his exceptional skill and enthusiasm The Billroth I technique of gastrectomy, in which the gastric stump is anastomosed to the duodenum, should avoid some of the troubles enumerated, because it does not disturb the flow of bile and because the capacity of the stomach cannot be reduced beyond a certain point if it is to be anastomosed to the duodenum Unfortunately this technique is difficult and sometimes impossible with duodenal ulceration, but it would be interesting to have a follow up, as detailed as MUIR'S, on a series of Billroth I operations, and to know how frequent are dumping and inability to maintain weight

Gastrectomy is now done so often that its failures demand careful study As HOSFORD[6] said when reviewing his gastrectomies, the truth is very elusive, and its capture here needs prodigious labours

Annotations

PENICILLIN RHEUMATISM, AND NEPHRITIS

WE recently concluded that penicillin can usefully be given to rheumatic subjects to prevent recurrent attacks of streptococcal throat infection but there is less certainty about its power to reduce the likelihood of rheumatic sequels when it is given to patients whose throats are already infected Jersild's observations on glomerulonephritis were more encouraging for he found no renal damage in 1000 cases of scarlet fever treated with penicillin.[8]

Weinstein et al[9] doubt whether penicillin given during streptococcal infection will prevent either rheumatic fever or nephritis In their uncontrolled series of 167 cases of scarlet fever all treated with penicillin (about three quarters of them within two days of the onset) rheumatic fever ensued in 12 (7 2%) and nephritis in 6 (3 6%) On the other hand, they think that in penicillin treated patients both rheumatic fever and nephritis may take an attenuated or cryptic form—which may pass unnoticed in the absence of repeated laboratory investigations including electrocardiographic and urinary studies Of their 12 rheumatic patients only 5 had an appreciable rise in temperature when the rheumatic process

5 Visick, A H *Lancet*, 1948 i, 595
6 Hosford, J P *Brit med. J* 1949 i 929
7 Leading article *Lancet*, July 22 1950 p 140
8 Jersild T *Ibid* 1948 i 671
9 Weinstein, L., Bachrach, L Boyer N H. *New Engl J Med* 1950 242 1002

seemed most active, in the other 7 "there was complete lack of febrile response at times when arthralgias were present, new murmurs were appearing and the electrocardiogram was showing progressive changes" In children, they insist the joint disorder manifests itself less commonly as a polyarthritis than as an arthralgia, which may not be migratory and may affect only one joint In only 1 of the 12 cases was the erythrocyte sedimentation rate increased while the rheumatic process was thought to be active, and serological studies yielded inconstant evidence of antibody formation Of the 6 patients with nephritis, only 1 had clinical manifestations, only 3 became febrile, and only 3 had an increased E S.R, and in not a single case was there serological evidence of antibody formation If as this paper suggests, the more serious complications of streptococcal infection may be masked rather than prevented by penicillin, children receiving such treatment will need more careful watching than most of them now receive

CORTISONE AND INSULIN

A RECENT preliminary report[1] suggests that insulin has a 'Cortisone' sparing action and that economy in cortisone dosage may be obtained by giving the two substances together Unpublished observations by Seneca and Ellenbogen on the action of steroid hormones on adrenocortical enzyme systems in vitro provided the rationale for these studies, cortisone may effect the synthesis of a tissue carbohydrate, and insulin may enhance this activity and make activation products of glucose readily available for tissues without requiring conversion from amino acids

Observations were made on nine women and three men, with rheumatoid arthritis in various stages (I–IV[2]) and of various durations (6 weeks to 20 years) Glucose tolerance tests were performed in all cases, and though the fasting blood-sugar was within normal limits there were cases in which return to the normal level was delayed 12 5–50 mg of cortisone acetate in an aqueous suspension and 20–60 units of plain insulin were then injected daily in single or divided doses during successive 10 day periods No clinical improvement was noted during 10 days in four patients given 12 5 mg cortisone and 20 units of insulin, but in six of eight patients given 25 mg of cortisone and 40 units of insulin for 10 days a rapid fall in sedimentation rate occurred, and four had definite signs of clinical reversal All twelve patients were then given 50 mg of cortisone and 40 units of insulin for 10 days, and during this period ten progressed to normal sedimentation rates and eight to well marked clinical reversals, grades I and II The patients also gained 4–29 lb in weight This dose of 50 mg of cortisone is only half the amount (100 mg) usually given daily, and further clinical benefit seemed to be obtainable at a dosage of 25 mg of cortisone and 40 units of insulin Except possibly in one patient who developed œdema of the ankles, no side effects attributable to cortisone were observed during the 30 day trial period Hypoglycæmia was readily controlled and was not related to the degree of response

Though Messrs Merck and Co have recently reduced the price of cortisone from $95 to $50 per gramme,[3] treatment is still expensive Henderson and his colleagues hope that critical evaluation of their work may establish a safer and more economical use of cortisone, and some explanation of its pharmacological action

EFFECTS OF CLIMATE ON ANIMALS

IF cattle could be made to produce beef and milk in warm climates at something like the level attained in temperate climates, a great advance would be gained against under nourishment To this end many tropical countries have tried to improve their stock by importing productive animals from temperate zones, either for pure or cross breeding, but only brief increases in production are achieved before the imported stock and their cross bred progeny show deterioration Kelly suggested that the most useful thing to do would be to isolate studs of milking strains of tropical zebu cattle under European control in a country where the herds could be expanded free from disease and made available to countries that needed them, but J D Findlay and his colleagues at the Hannah Dairy Research Institute while commending this proposal, think that the fundamental question of temperature regulation in cattle should be studied As a first step to such a study Findlay has reviewed existing knowledge

In hot climates, he says, tropical cattle can cope better than those imported from temperate climates and field tests show that their body temperatures are influenced by high air temperatures and humidity, respiration rates are also less liable to increase, and as a criterion woolly coated animals are less able to cope than those with glossy coats Contrary to what is seen in man, the pulse rate of cattle is increased by heat only as a prelude to complete breakdown under extreme conditions The skins of tropical cattle often allow considerable loss by diffusion, but it is still uncertain whether they are capable of active sweating These and many other questions in animal physiology require further investigation by the methods commonly used in human physiology Much of our information about climatic effects on farm animals has been gained by simple methods, and though some of these are admirable for their purpose others are crude and misleading For their own investigations the Hannah Institute has built a psychrometric room, suitable for the study of one at a time, in which the temperature, humidity, and movement may be varied independently and kept almost constant at any given level This room and its adjacent observation chamber are equipped with the modern apparatus for accurate and continuous recordings of the animal and the cow's reactions

One chapter of Findlay's monograph briefly surveys the effects of tropical environments on sheep, pigs, and fowls The pig is particularly sensitive to climatic changes, and it plays a larger part in the agricultural economy of Great Britain than of the Colonies For this reason perhaps, some recent studies[2] of its reactions to the Scottish climate were concerned with the effects not of excessive heat but of excessive cold

THE C H S C

AT the Trades Union Congress on Sept 5 Dr H B Carr, secretary of the Medical Practitioners Union, said he would like to see the constitution of the Central Health Services Council revised so that it became a great [illegible] representing all the people in the National Health Service including nurses and even cleaners It should then be given wider functions as the permanent advisory planning commission At present, he declared, there was no plan for the future development of the service as a whole

DIAGNOSIS OF GASTRIC CARCINOMA

THE diagnosis of gastric carcinoma is often baffling until the surgeon intervenes or the march of the disease dispels doubt Papanicolaou's method of establishing the presence of malignancy by examination of exfoliated cells[3] has also proved of value in gastric cases[4], and now, with his colleagues,[5] he has developed a refinement which seems to promise still greater accuracy Broadly, this consists in producing mechanical irritation of the gastric mucosa by means of an inflatable balloon rendered abrasive by knotting untreated braided silk on its surface Of 33 cases where the diagnosis was later established by operation or biopsy 17 were malignant (carcinoma 14, Hodgkin's disease 2, reticulum cell sarcoma 1), and 15 benign (polyps 2, gastric ulcer 10, gastritis 3), in 1 no lesion was demonstrated Among the 17 cases of proved malignant disease, smears by washing the balloon after withdrawal yielded malignant cells in 16, suspicious cells in 1, and no malignant cells in 2 (both Hodgkin's disease) The benign lesions produced no false positives

This procedure appears somewhat heroic but it has not led to any hæmorrhagic or other serious complication, largely no doubt because it has not been used in the presence of supposed active upper gastro intestinal bleeding, pyloric stenosis, gastric perforations œsophageal varices, or œsophageal obstruction The results recorded are impressively better than those the same workers obtained on the same patients with routine smears from gastric aspirate

1 Henderson E Gray J W Weinberg M Merrick E Z Seneca H *J clin Endocrinol* 1950 10 800
2 Steinbrocker O Traeger C H Batterman R C *J Amer med Ass* 1949 140 659
3 See *Brit med J* Sept. 2 1950 p 581

1 The Effects of Temperature Humidity Air Movement and Solar Radiation on the Behaviour and Physiology of Cattle and other Farm Animals Bulletin no 9 published by the Hannah Dairy Research Institute Kirkhill, Ayr 19[illegible] Pp 178 6s
2 See *Lancet* 1950, I 915
3 See leading article *Ibid*, 1948, I 330
4 See annotation *Ibid* p 683
5 Panico F G Papanicolaou G N Cooper W A *J Amer med Ass* 1950 143 1308

WESTERN UNION

ıblic health committee of the Western Union Powers cessful sixth session from Sept 7 to 9 in Edinburgh tudy of health services in relation to civil defence n, by the exchange of documents visits of experts establishment of a subcommittee which will meet ls on Nov 21 A uniform system of health control of c, similar to that already in force for air traffic will ı March 1, 1951 In practice this will mean that tive freedom from control of ships arriving here tween Brest and the Elbe will be extended to the and Mediterranean coasts of metropolitan France enth session will be held in Marseilles on March 20

LICATIONS OF CARDIAC CATHETERISATION

ıE reports from the U S A indicate that catheterisation heart, though usually accomplished without trouble [1] ıve unpleasant and even dangerous effects Southworth report the case of a 25 year-old woman with congenital lisease in whom a catheter was advanced from the moral vein (the arm veins being unsatisfactory) into ght ventricle Ventricular fibrillation started and ued for at least three quarters of an hour during oxygenation was maintained by cardiac compression rtificial respiration Normal rhythm was restored after ıistration of procaine hydrochloride and xylocaine ɔchloride with small amounts of adrenaline, and electric Bruce et al [3] record a case of cardiac enlargement Wolff Parkinson White syndrome (abnormally short P–R ıal, usually prolonged Q R S complex, and history of rent paroxysmal tachycardia[4]) in which the introduction e catheter from the right arm to the region of the tricuspid e led to multifocal ventricular tachycardia Nine hours after other measures had failed, atropine sulphate ıvenously (0·0012 g) promptly converted the ventricular ıycardia to a supraventricular tachycardia resembling cular flutter, which changed to sinus rhythm with a mal rate Lastly Michel et al [5] report that of 133 patients mitted under fluoroscopic control to cardiac catheteri on, usually under local anæsthesia, via the antecubital ɔ, 37% developed an arrhythmia The incidence of ırthmia was 19% with the catheter tip in the right atrium % in the right ventricle, and 19% in the pulmonary ɔrial tree and the incidence was higher in patients with genital heart-disease and in those with pre-existing trocardiographic abnormalities The arrhythmia was nsitory except in one case, in which the patient died re the catheter induced arrhythmia, together with esthetic depression of the respiratory centre may it ɔms, have contributed to the fatal outcome

PUBLICITY FOR CANCER

IN the *Medical Officer* for Sept 9 Dr Malcolm Donaldson ıses again the question of more active instruction of the y public on cancer and the advantages of early treatment e points out that great numbers of people have erroneous eas about the disease and are too much afraid of it, and he ınks that this fear is increased by being bottled up 'In merica and some other countries he says, all taboos ncerning cancer have been removed and people talk about freely' but in this country 'scarcely any newspaper will ɔention the word 'cancer unless some institution is prepared ' pay heavily for an advertisement '

From this standpoint it is perhaps all to the good that *ıcture Post*, a journal with an immense circulation, should ıve the courage to publish last week a long illustrated ticle on cancer It is likely to weaken the taboo But we ɔuld wish that the article were not devoted to the claims of a unorthodox method of treatment whose nature remains ndisclosed and whose value is, to say the least unproven nce 1919 Mr David Rees Evans has been using, with ıodifications, the "Cardigan cancer cure' which was brought efore the public more than forty years ago, and since last lovember he has treated 16 cases at the Presbyterian Hospital Jewark New Jersey Anyone unfamiliar with the history f other cancer cures is likely to feel that the initial results in these cases, and the supporting data, make an authoritative investigation urgently necessary, but the medical profession has a well founded objection to the treatment of patients with unknown remedies, and these objections are not entirely met by Mr Rees Evans's willingness to 'disclose the full details of his preparations and methods of treatment to a properly constituted committee, *following* tests under agreed conditions of control" (our italics) The first requirement seems to be a considered report from the American doctors who gave him facilities

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Dr H MORLEY FLETCHER consulting physician to St Bartholomew's Hospital, died at his home at Petworth on Sept 9, at the age of 85

Reviews of Books

Recent Advances in Pharmacology (London J & A Churchill 1950 Pp 418 24*s*)—To display the growing edge of a new science is by no means easy Recent advances must in fact be recent enough to call for comment, yet a reasonable period must elapse before fresh claims can be related to the background of established knowledge The publishers of this book may be congratulated on their choice of authors, for Prof J M Robson of Guy's Hospital Medical School, and Dr C A Keele, of Middlesex Hospital Medical School have produced a notable addition to pharmacological literature They conduct the reader through the labyrinths of new knowledge of such substances as the anti cholinesterase drugs, the anti histamines and the steroids of the gonads and adrenal cortex—to mention but 3 of the 18 chapters The section on the mode of action of drugs is masterly, and that on the evaluation of the actions of drugs in man deserves the subtitle "statistics without tears References are abundant and errors very scarce The book is likely to be in great demand among students of pharmacology and postgraduates in general medicine

Organic Chemistry (4th English ed London Cleaver Hume Press 1950 Pp 983 57*s* 6*d*)—Prof Paul Karrer, of Zürich, is a mine of information about organic reactions and structure, but it is unfortunate that he records incorrectly, or discusses from outmoded angles, many points of particular interest to doctors Thus in the description of alcoholic fermentation the energetic aspects, including the rôle and production of A T P, are neglected, and Scottish readers will be horrified to read that whisky is made from maize or rye, neither of which is used in the production of Scotch' There are some other biological mis statements and omissions no mention is made, for instance of recent advances in the analysis of protein carbohydrate, and carotenoid by the application of chromatography It is to be hoped that in the next edition the more biological sections will be efficiently revised so as not to detract as they do at present from the value of the purely chemical information

Modern School Hygiene (14th ed London James Nisbet 1950 Pp 480 12*s* 6*d*)—This book by Dr R Gamlin, chief assistant school medical officer for Liverpool, is essentially a reference work on matters relating to the school medical service, and it is intended for teachers rather than doctors It opens with a chapter on heredity, and chapters follow on elementary physiology and pathology and their applications in child health These are lucid and to the point, but perhaps rather dogmatic for example the assertion that only full cream dried milks should be used in infant feeding would not find general acceptance among clinicians There are some good chapters on physically handicapped pupils, mental defectives and educationally subnormal children explaining the educational facilities for them under the Education Act The common infectious illnesses are described but a serious omission is the streptococcal throat, which next to the common cold, is the commonest infection among school children The passages on poliomyelitis make no mention of abortive infections The book concludes with an interesting chapter on school architecture, a short glossary of medical terms, and a bibliography The author seems happier when dealing with the administrative than with the clinical aspects of school hygiene, but on the whole he does what he sets out to do for the school teacher, and he provides some useful sections for the doctor concerned with education

See leading article *Lancet*, 1950 i 863
Southworth J L McKusick V A Peirce E C Rawson F L *J Amer med Ass* 1950 143 717
Bruce R A Yu P N G Lovejoy F W jun McDowell M E Pearson R *Circulation* 1950 2 245
Wolff L Parkinson J White P D *Amer Heart J* 1930 5, 685
Michel J Johnson A D Bridges W C Lehmann J H Gray F Field L Green D M *Circulation* 1950 2 240

British Red Cross Society First Aid Manual, No 1 (*9th ed London Macmillan Pp 300 3s*)—*The first* new edition of this famous manual for ten years has been largely rewritten and since the authors are Sir Harold Whittingham and Sir Stanford Cade, this has been done very adequately indeed Material has been added to cover the needs of Civil Defence in air raids, including atomic warfare, and there has been a welcome pruning of theory and concentration on the really practical aspects of the subject

Introduction to Physical Biochemistry (2nd ed London Cassell 1949 Pp 246 27*s* 6*d*)—This book, first published in 1941, has been considerably revised without structural alterations The opening chapters are concerned with those physical properties of water, solutions, gases, and *colloids* which play an essential part in body processes, while later chapters discuss chemical equilibrium, buffer systems, respiratory functions of blood, oxidation reduction systems, and the acid base balance of the blood The author, Prof J M Johlin, of Vanderbilt University, might be more explicit in his references to 'larger textbooks," but his book certainly forms a readable introduction to an aspect of biochemistry which can easily be made dull and unintelligible

From Letters to the Editor

Intrathecal Tuberculin—Though I do not wish to dispute the observations and conclusions of Dr Smith and Dr Vollum (Aug 19), I think that an alternative and simple explanation of the dramatic recovery of these patients is *possible and should be excluded before* any large scale trial of intrathecal tuberculin is undertaken Choremis and Vrachnos (*Lancet*, 1948, ii, 408, 513) have emphasised the intense meningeal irritation which can be caused by intrathecal streptomycin, which may superimpose a chemical meningitis on an infective one Increasing opisthotonos, repeated uncontrollable vomiting, and hydrocephalus due to subarachnoid block are *results observed by Choremis following* intrathecal injection of 100 mg or more of streptomycin It is perhaps significant that in Dr Smith's cases tubercle bacilli were no longer to be found in the C S F when intrathecal tuberculin was started, and even more so that it was only some days after all intensive intrathecal therapy had been *discontinued* that improvement took place Furthermore there was no opportunity of observing the possible deleterious effects of another course of intrathecal streptomycin during the surprisingly smooth convalescence of these two 'hopeless" cases Is it not possible that what actually happened was that the initial course of chemotherapy had to all intents and purposes replaced the tuberculous meningitis by a chemical one, and that this was being perpetuated, whether by streptomycin intrathecally or by the even more noxious tuberculin (P P D)? When all intrathecal interference was discontinued, the meningeal irritation ceased and the patient recovered—S L O JACKSON, M R C.P (Brompton Hospital London S W 3)

Teaching at Non-teaching Hospitals—Whatever may have been the teacher's training, his success in imparting knowledge and understanding depends on his desire to teach, and his possession of an animating and dynamic force The University Grants Committee warns against promotion based solely on research, rather than on personal qualities and teaching ability yet how few excellent clinical teachers are so encouraged I would plead for a return to teaching of the simple clinical methods the inculcation into the student of the elemental necessity of training his sensés, the assembling of the facts in a reasoned manner and direction in the way of interpreting them along physiological and pathological lines When these have been mastered then is the time to fortify and confirm the clinical *diagnosis* by the *ancillary* investigations which it seems the student must know

Clinical material in the teaching hospital is limited, but many men who have had experience in teaching hospitals occupy *positions on the staffs of non teaching hospitals* and efforts should be made to include them in the teaching of medicine Not only students but also registrars could benefit from the teaching of some of those clinicians who may *have hitherto* thought themselves out in the wilderness' and it is to be hoped that regional boards will have the vision to encourage a proportion of their registrars to go to non teaching hospitals—W R BLACK F R C S (Weston Super Mare)

In England Now

What a week! Telephone ringing day and night. brr Brr brr Brr brr

From an Old Faithful—'About this B.B.C appeal I'm a regular donor and should like to give my blood My dear I'm a rare group'—What is your group?—"Group O *minus*'—'Thank you very much for ringing us, but the exact group we want

From a Facetious Houseman—"Hullo! I've got the want'—'What man?—His group is ODECDE'—'I big D or a little D?—'I don't know what you mean Caesar D for Daddy E for Erythroblastosis (Ha! Ha!" it' said I is it a capital D or a small D?'—"I don't know on and I'll find out' A minute or two later "Sorry little D and' (he bursts into song) "the other is a Bl D (Ha! Ha!)'

From a Very Superior Person—I've just been radio and I shouldn't really mind giving a pint of my *that pooah woman*'—Yes, *madam and what is your group*" 'I really don't know but I am a rear type"

And so it went on, day after day, night after night, calls from the hopefuls, the enthusiasts, and the types—alphabetical explanations, permutations and binations, the C's, the D's and the E's, the little C's little D's and the little E's How the gods and Wiener must have laughed!

Preclinical Teaching—Dr Johnson (Aug 26) the Moran Committee as saying that the average graduate tends to lack curiosity *and initiative* and his powers of observation are relatively undeveloped She then describes exercises aimed at forestalling these deficiencies, and calling for an effort by the student But if it is important to train the student to observe it is even more important not to destroy his natural desire to learn. Often he feels frustrated by methods of instruction which, though interesting are remote from practical reality and encourage a curiosity *to learn the* "tricks" of examiners rather than to seek knowledge for its use in his future medical work Clever exercises should not enable the lecturer and demonstrator to control out of their habilities to instruct, for personal example is the best means of *inspiring* and encouraging *good habits* If the teachers themselves really show insight, method enthusiasm, and powers of observation the student *will follow* their example The closer the teacher student relation the higher the *quality of the learning* and the greater opportunity for initiative—MEDICAL STUDENT

Preclinical Education—Dr Johnson refers to the unscientific approach of students to scientific problems, and Dr Dicks deplores the lack of the human aspect in preclinical training It looks as though the student is to have two further calls on his time—discussion periods and anthropology But the *fault*, and the opportunity for its remedy, are to be found at an earlier stage for the neglect of the human and of a scientific attitude to scientific matters starts at school This is not the fault of the teachers it is the hospital and university entrance examinations which are at the root of the trouble As long as it is possible to pass these with little more than a stock of *factual* knowledge the schools will, and must, provide this first and foremost As soon as a more general education becomes essential for passing these entrance examinations, much of the grounds for Dr Johnson's and Dr Dicks's just criticisms will be removed—JOHN L STRUTHERS

Antimalarial Drugs—*As you say* (Aug 19), quinine amblyopia is rare in West Africa However, your remark that "it would be wrong to assume that blackwater has disappeared from West Africa since the almost universal *application of mepacrine calls for comment* It is true that blackwater fever has not entirely disappeared but it has become strikingly uncommon despite the increase of the non immune population in all four West African dependencies In Nigeria during 1931–1942 *the average* number of cases was 15 per year in the non African population averaging 6000, during 1943–49 the average number of cases was 6 per year in a population averaging over 8000 and during 1948–49 there were only 3 cases of blackwater fever in a population of about 11 000 Moreover, of these 3 cases of blackwater fever 1 was in a patient known to take quinine as a suppressive The decrease of the incidence of the disease in non Africans from 1943 onwards coincided with the general substitution, first of mepacrine (1943) and then of proguanil (1947) *for regular suppressive quinine* Treatment of acute malaria with quinine alone or combined with other antimalarial drugs is still favoured by many medical officers

and there is no evidence that the *therapeutic* use had any bearing on the incidence of blackwater e similarity of the above findings to those of 1941–45 for European military personnel in West triking, and confirms the close relationships of this th suppressive quinine medication —LEONARD J WATT, M D, senior malariologist Nigeria

ipkinless Age —I was interested to read (Aug 12 f the new plastic napkin containers for use with disposable napkins Similar containers have been ere in Switzerland, and I have been using them for for the last eight months (since she was 6 months have found them most satisfactory though I have using the disposable cellulose fillers for three reasons are expensive, (2) they tend to disintegrate when stick to the baby s skin, thus obliging one to wash v at every nappie change and (3) they are not tly absorbent Instead, I find that an ordinary e gauze napkin, folded to the appropriate shape ficient and when soiled, is easily washed Since the of these containers is rather erratic I have begun them myself, and find them very cheap and easy to t —MURIEL WOOLMAN (Basle Switzerland)

Treatment of Urinary Bilharziasis —I have tried ct of 'Nilodin' (B W & Co) a preparation of Miracil sugar-enteric-coated pills in three proved cases of *soma hæmatobium* infestation The dose régime was ecommended by the manufacturers—i e, a total of per kg body weight given as 10 mg twice daily for days One of the patients received two courses with a between them he discharged himself still passing ova urine The second patient had only one course and discharged himself with ova in the urine The third it, who is still in hospital continued to pass ova after courses, but was cleared after a course of 'Fantorin' phen) which is sodium antimony bispyrocatechol 3 5 m disulphonate this patient is now under treatment ie secondary anæmia *only*

is confirms the observations of Alves (*Lancet*, 1950, i, , and I must add that the sugar enteric-coated nilodin ire poorly absorbed in the Iraqi gut too —Dr M FAWZI artment of Therapeutics Royal College of Medicine ad.)

otection of the Skin from Sunburn —Dr Russell Dr Anderson say in their article of Aug 12 that there is no ence that the antihistamines by mouth are of use in ma solare Yet they seem to have missed the opportunity utting this to the test in their case Earlier this year I a case similar to theirs The patient also a civil servant 53 years of age and had become hypersensitive to sunlight vest Africa twenty years ago I prescribed both 'Anthisan g t.d.s by mouth and as a light screening agent *p* amino zoic acid in paraffin (I asked for this substance in the e that it would be obtained quicker than the reputedly e effective ethyl *p* diethylaminobenzoate) However e was a delay of 5 days in getting the substance and ing this time the anthisan cured the patient who was to resume work.—S SHUBSACHS M R C S (Manchester)

nuresis and Hypersomnia —Dr Ström Olsen s case orts in his article of July 22, may lead to the idea that wetting in heavy sleepers who have no obvious signs of iety is secondary to the deep sleep The enuresis and ersomnia may be unconnected

A girl, aged 6 years had always wet the bed She was a p sleeper and was not conscious when raised at night to ate. The family seemed a united one, and her mother noted no symptoms of anxiety In the 17th psychiatric erview she drew a scene from *Hansel and Gretel* which was erpreted to her in terms of her own aggressive feelings to mother She was indignant but only had two wet nights kly for the next three weeks and then only one wet ht in six weeks Her mother stated however that she slept as heavily as ever

A boy, aged 12 years athletic intelligent jolly and with ny friends had wet the bed since birth His family seemed ited and made no other complaints about him He was a avy sleeper and was raised by his parents twice nightly had received medical treatment for three years without nefit and psychotherapy had no obvious effect on his behaviour or enuresis It showed, however, that he had no overt anxiety, that he was reluctant to take responsibility and that his expressed fantasies contained remarkably few female figures or symbols In the course of treatment he developed erythema nodosum and was hospitalised The ward sister, forewarned, kept him dry for five weeks by raising him at increasing intervals during the night He was then sent home with an alarm clock, and his parents were told to delegate full responsibility for dry beds to him He remained dry for two weeks and then relapsed It was found that his parents had again resorted to lifting him as 'he is too deep a sleeper to set the alarm for 5 A M after it has woken him at 11 P M' They were discouraged from their over indulgent attitude, and he was dry again for a further month, setting the alarm himself and waking to urinate He relapsed again, completely, following a threat to send him to boarding school if he refused to abstain from athletics following his attack of erythema nodosum This new bout of wetting was accompanied by open defiance of his parents and small destructive acts

The first case shows that cessation of bedwetting in a deep sleeper is not necessarily accompanied by lighter sleep The second case shows how over dependent enuretics with over protective parents may use the excuse of deep sleep to serve their own ends —RICHARD MEYER, M R C P (Hospital for Sick Children, Great Ormond Street, London, W C 1)

Patients' Travelling Expenses —The changes in conditions under which travelling expenses may be paid (*Lancet*, Aug 12 p 273) will throw an added burden on the staffs of the National Assistance Board and chest clinics and the financial saving will be paltry in the case of tuberculous patients For many years free travel to and from sanatorium has been included in the tuberculosis service without regard to the income of the patient The reintroduction of a means test in this connection is highly retrograde and we even foresee the possibility of a patient s admission to sanatorium being hindered by the time taken by, and/or the result of, the National Assistance Board's inquiries It would have been better if the Ministry had not made these changes without due regard to the special circumstances of the tuberculous who often have to travel long distances for sanatorium treatment and who by the time a vacancy is offered have usually suffered considerable financial reverses The Minister recently voiced his concern at the grave problems involved in the treatment of tuberculosis, and we hope he will reconsider this additional difficulty he has imposed —C W L JEANES M R C S chest physician, Greenwich, B J MALLEY, M D chest physician Bermondsey C F PRICE, M B chest clinic Camberwell, E K PRITCHARD, M R C S, chest physician, Southwark J P V RIGBY, B M, chest physician Deptford J E STOKES, M D, chest physician, Lewisham

Endometrial Tuberculosis —Within the past four months it has been stated (*Lancet* 1950 i 733 and Aug 5, p 220) that Mr J A Stallworthy has achieved apparent cure in 5 of 6 patients treated with streptomycin and that apparent cure is presumed after three consecutive negative tests at monthly intervals The first is encouraging news, but I feel that as pelvic tuberculosis is a blood borne disease and the focal point must often be outside the field of gynæcology, the absence of lesions in biopsies for the short time of three months after treatment is not sufficient evidence of cure In our smaller series biopsies and cultures have more than once been negative for more than a month in untreated cases —MAGNUS HAINES, M D (Chelsea Hospital for Women, S W 3)

Psychiatric Social Worker —I agree wholeheartedly with the opinions expressed in your annotation and by Dr Sessions Hodge (Aug 12) The skilled psychiatric social worker plays an essential part in the field of psychiatry and her place cannot possibly be taken by those whose experience has been confined to administrative work. In the week when the Nottingham County Council s advertisement appeared the B.M.A annual conference devoted a session to the role of the psychiatric social worker at which members deplored the shortage of trained workers and made suggestions for the most profitable use of the small number available It was felt that the profession could not hope for the necessary expansion unless a reward was offered to some extent commensurate with the requirements of long training high

personal qualifications, and arduous and exacting work The existing negotiating machinery seems to be doing nothing to remedy the present anomaly in the salary scales To perpetuate these conditions seems to be a strange policy for a Ministry whose professed aim is to base a complete National Health Service upon highly qualified and skilled personnel — DESMOND CURRAN, F R C P (St George's Hospital, London, S W 1)

Origins and Outcomes of the Patient's Stay in Hospital —The final section of the article by Miss Addiscott and her colleagues (Aug 26) suggests that the almoner may make the patient aware of her critical attitude towards his habits in such a way as to cause resentment But in fact one of the main objects of her training is to enable her to establish a good relationship with her patient as the basis of her social therapy The question of criticism, overt or implied, seldom arises, but where it does, the good contact established should enable the patient to absorb and act upon the almoner s suggestions for his welfare without the resentment which would be as disastrous to the almoner patient relationship as to that between doctor and patient —MARY W WINDSOR, A M I A, ELIZABETH ALEXANDRE, A M I A (Manchester Royal Infirmary)

Ways into General Practice —Your leading article of Aug 26 says that the easiest path to the status of principal is by preliminary assistantship The *British Medical Journal* of Sept 2 contains two advertisements of vacancies for assistantship with view and twelve advertisements from practitioners requiring an assistantship with view Inquiry at the Medical Practices Advisory Bureau would also show that there are many more applicants than openings You say that "the chances of getting into practice seem rather less bleak than they have sometimes been painted" This may be so, but it is unsatisfactory that they should be bleak at all, in view of statements on behalf of the Government that the entry into general practice would be facilitated by the Health Service In fact it has been made more difficult, and a real effort should now be made to fulfil the promise.—I DOCTOR

Inoculation Certificates Required Abroad British Overseas Airways Corporation has the most up-to-date information in this country on the requirements of governments regarding certification of vaccination or inoculation needed by travellers by air This information is obtained from the World Health Organization's *Epidemiological Record* and daily broadcasts, the World Health's weekly return of infectious diseases and daily reports from the Corporation's agents throughout the world I support your footnote to the letter from Sir Philip Bahr (July 22), to the effect that doctors requiring such information on this matter should apply to the Medical Department, British Overseas Airways Corporation, Dorland House, Piccadilly, W 1 (Tel Mayfair 6611) or to representatives in the U K of the countries which a traveller intends to visit or transit —SIR HAROLD WHITEHAM, F R C P, director of medical services, B O A C

An Unconscionable Time A-dying —The entitled article by Dr Jackson in your issue of Aug 26 an experience this year in a staggeringly expensive nursing home

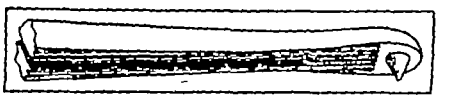
I was awakened by a choking sensation and an overpowering stench Knowing that large industrial concerns were near I thought "an explosion" and struggled from bed to shut the window, from which I imagined the fumes were entering Worse ensued however Knowing that the ringing produced negative results, I emerged again to ring and lean out of the window That was better, and after a time it struck me that some over fumigation process was going on nearby True enough a patient had died and a bed was urgently wanted, so combined sulphur and formaldehyde had been decided upon to hasten the process. Next day the staff seemed pained to think that their zeal had not been appreciated, quoting quite recent textbooks on the subject of disinfection —ESTHER CARLING M.D (Northwood, Middlesex)

Notes and News

Goeffaerts Gastrectomy Clamp

Mr Geoffrey Parker, F R C S, writes Many British surgeons in the later stages of the war enjoyed the hospitality of Dr Goeffaerts, of Alost, in Belgium and admired his effortless technique His untimely death, on the eve of his appointment to a surgical chair, deprived Belgium of one of her finest operators and teachers

The clamp that I use in subtotal gastrectomies (made by John Bell & Croyden Ltd, London, W 1) was designed by Dr Goeffaerts It is essentially a large size Payr clamp with a longitudinal groove through each blade (see figure) It is applied in the usual way at the site determined for cutting across the cardiac end of the stomach The distal portion of



the stomach is closed with a straight Doyen's clamp to prevent soiling and cut away Interrupted linen thread sutures are then passed through the slits in the blades and tied off, and the ends are cut short The clamp can be removed before or after inserting the outer layer of sutures of the anastomosis to the duodenum or jejunum After its removal, the part of the stomach to be used for the anastomosis is kept closed with straight Kocher forceps while the part not so required is closed with a second layer of continuous or interrupted sutures The anterior layers of the anastomosis are inserted as usual, a Hofmeister valve, if required, is made by fixing the proximal jejunum with interrupted sutures along the line of the closed portion of the stomach In over 100 consecutive gastrectomies where this clamp has been used I have had no postoperative bleeding from the anastomoses, in spite of the attempts of enthusiastic house surgeons to relieve non existent hæmorrhage and distension with gastric suction All the patients took unrestricted fluids by mouth 12 hours after operation the only proviso being that they must drink from a teaspoon to avoid too rapid filling of the gastric stump

Notifications of poliomyelitis in the week ended Sept 9 were paralytic 302 (previous week 369) non paralytic 189 (220) 491 (589) The only counties showing more than average increase were Kent and the West Riding

At the University of Edinburgh on Oct 9, 10 and 11 Mr Norman Tanner will give three lectures on the Surgical Treatment of Ulcer On Oct 13 Dr Philip S Hench, of the Mayo Clinic, will speak on the Present Status of Cortisone and A C T H in Medicine All these Macarthur lectures will be given in the anatomy lecture theatre University New Buildings at 5 P M

The following have been admitted to the fellowship of the Royal Faculty of Physicians and Surgeons of Glasgow *qua* physician Jr Colvin R J Cuthbert, J C C Kelly R J Mcwilliam S S Mcwilliam Jr J McC Murdoch G B Shaw

On Friday Sept 22 at 11 A M at the University of Liverpool the Biochemical Society is holding a symposium on the biochemistry of Fish

Dr Leonard Colebrook, F R S and Dr J P Bull will speak at a symposium on burns which the National Research Council is holding in Washington at the request of the Department of Defence Nov 2 3 and 4 Those wishing to attend should notify the secretary of the division of medical sciences of the council 2101 Constitution Avenue Washington 25 D C U S A

The Medical Research Council invite applications from non-qualified men or women with one or two years experience in biology appointments for a studentship (£500 p a) for training in research of experimental psychology tenable at the psychological laboratory University of Cambridge for not less than one year Application forms to be returned before Oct 1 may be had from the secretary of the council 38 Old Queen Street London S W 1

The chief medical officer of the Ministry of Health has asked all general practitioners a list of proprietary medicine which are advertised direct to the public Following the report of the committee on prescribing (*Lancet* July 8 p 66) he has asked doctors to try to avoid prescribing any of the substances on the list "unless in your professional judgment you feel clear that there is special justification for doing so in any individual case"

The Charity Commissioners propose to establish a scheme for the regulation of the Benevolent Medical Society of Hertfordshire The scheme can be seen at 2 Parliament Street Hertford and copies can be bought at the office of the commission (2s 2d) Objections or suggestions may within 21 days be sent to the secretary of the commission Ryder Street London S W 1

The classification of junior hospital posts as A B C and D is to be discontinued from Sept 30

The National Institute for the Deaf has published a new approved list of manufacturers and suppliers of deaf aids who have entered into an agreement with the institute as to their methods of trading The list (price 3d) may be had from the institute 105 Gower Street London W C 1

e investigation shows that it takes on an average tes to fit and supply a pair of spectacle under the Health Service (Report of Working Party Par 1 onery Office Pp 56 1s) To dispense a pair for a tient took 45-47 minutes The ratio of repairs to new about 11% but as most of the N H S glasses are at w it is thought that this will probably increase to about pairs take an average of 9 74 minutes

ish Epilepsy Association founded in July as a memorial Fox met on Sept 5 with Lady Cynthia Colville in Its aims include the general education of the public ore specialised education of those in charge of epileptic the creation of an information and advisory service tance in establishing hostels and convalescent homes rovisional council are Sir Charles Symonds Dr Russell r Macdonald Critchley Dr Letitia Fairfield and Dr iliams

The fourth reunion of the 2nd British General Hospital in the 1939–45 war will be held on Saturday Oct 7 at Simpson's Restaurant Strand London W C 2 Tickets may be had from Dr J H Eaton 29 Biddenham Turn Bedford

The responsibilities of the veterinary profession should not stop at the farm gate declared Mr John Bruford in his presidential address to the National Veterinary Association at Cardiff on Sept. 6 To ensure cleaner food he held that the veterinary surgeon should have authority to inspect it up to the time it is bought by the housewife

During 1949 the number of voluntarily registered disabled persons rose by 27 000 to over 935 000 of whom 131 813 were pensioners of the 1914–18 war and 415 021 were other ex Service men and women (Annual Report of the Ministry of Labour and National Service for 1949 H M. Stationery Office 4s)

ACADEMICAL AND EDUCATIONAL

ollege of Surgeons of England
urgery lectures and 10 clinical
ences Sept 28–Oct 13 at selected
als Fees (whole course 12 gns
es only 8 gns) with application to
ary Postgrad Education Com
P C S Lincoln's Inn fields
,

e of Urology St Peter's Hosp
2 Postgraduate course in V D
3–Nov 30 Fee 12 guineas
application)

Vale Hospital Neurological
hing session for postgraduates
2–Dec 22. Clinical demonstrations
y Friday from Oct 13–Dec 15
P.M.

Institute of Child Health & Neurology Postgrad. lectures at National Hospital Queen square 5 P.M Mondays Oct 16–Dec 18 on neurological diseases in children Fee (3 gns) with application to Secretary Inst of Child Health Hospital for Sick Children W C 1

Tuberculosis Educational Institute 3-day clinical courses Aintree Liverpool (starts Oct 25) Godalming Surrey (Oct 17 and Nov 21) Market Drayton Salop (Oct 11 Nov 8 Dec 13) Torquay Dec Aberdeen (Oct 11) Fees 3 gns Apply Secretary Tavistock House North W C 1

Aberdeen Univ Anatomy Lectureship Apply by Oct 2

Chester Beatty Research Institute Research post (mainly avian tumour viruses) Apply Secretary Royal Cancer Hospital S W 3 by Sept. 30

Alfred Adler Medical Society Training course psychotherapy Apply Hon Secretary Institute of Individual Psychology 9 Fellows road N W 3

Liverpool University Whole-time Gynaecology Tutor (non res) Salary £600–£1400 Apply to Registrar by Sept 25

Liverpool University Whole-time course advanced obstetrics and gynaecology Dec 4–16 Fee 10 gns Apply Dean Faculty of Medicine by Oct 21

Guy's Hospital 2 Junior Pharmacology Lectureships Apply by Oct 4

LIST OF HOSPITAL VACANCIES

t Dock Orth. & Frac E 16—H S
)
al Middlesex, N W 10—H O (B2)
d., H O (A/B2) gen med hæma &
locrin., H O (B2) T.B H O (A B2)
l. med. and cardio H.O (A B2)
l. & neurosurg Jr Reg. (B1) path
O (B2) gen. med & neurosurg Jr
g (B1) cas
End Maty E 1—Jr Obst O (B1)
beth Garrett Anderson N W 1—
st. Asst (A/B2)
ham, E 8—Jr Reg Anæs (B1) cas
s & York Clinic S E 1—Asst Phys
rch Med
kney E.9—H.S (A/B2) E.N T & cas
mpstead General N W.3—H S (B2)
as O.s (B2)
spital for Sick Children W C 1—Jr
æs. Reg (B1) H.P (B1) H S (B1)
mbeth, S E 11—Sr H P (B2)
ndon Jewish, E 1—Sr R.M.O (B1) H.S
ler Gen. S E.10—Anæs (B2)
nce of Wales Gen N 15—C O (B2)
yal Cancer S W.3—H.S (B2)
yal Northern, N 7—Orth. H S & C O
B2).
Ann s Gen. N 15—H P (B2)
Leonard's N 1—H.S (A B2) H.P
A/B2)
Olave's S.E.16—Reg in Anæs
th Western, S W 9—H.S (A/B2)
st London, W 6—Jr H.M.O (B1) cas
toria Hosp for Children S W 3—H P
A).

Provincial

Lord, Kent. Wille borough.—H P (B2)
med. & O.P
Irincham. St Anne's E.N T—H O
(A/B2)
hton, Hyde, & Glossop H M.C—Reg
(B1) chest dis & T.B
hton Infy & Lake Hosp—Orth H.S
(A/B2)
hton u Lyne Dist Infy—H.S (A B2)
Male.
ylesbury Tindal Gen.—H.P.s (A/B2)
arrow in Furness North Lonsdale—H.S
(A/B2)

Batley & Dist Gen—H O (A/B2)
Bebington Clatterbridge Gen—H S
(A/B2) orth
Bedford Gen—H.S (B2)
Billericay St Andrew's—Obst Reg (B1)
H S (B2)
Birmingham 18 Dudley Road—Jr Reg
(B1) E N T
Birmingham Dudley Road Infy—Jr
H M.O (B1)
Birmingham Hollymoor—Locum Reg
Birmingham Hollymoor—Jr H.M O (B1)
Birmingham Maty—H S (B2)
Birmingham Accident—H S (A B2) Sr
Reg
Birmingham Royal Orth.—H O (B2)
Bristol Frenchay—H S (A/B2) neuro
surg
Barnet Gen—Jr Anæs Reg
Bishop's Stortford Haymeads—H O (A/
B2) med
Bowden St Anne's E N T—Jr E N T
Reg (B1)
Braintree Black Notley—Reg (B1)
pulmonary T B Orth. H O (A/B2)
H P (A/B2)
Brighton Sussex Eye—Sr H.S (B2)
Brighton & Lewes H.M.C—2nd H S
(A/B2) E.N T
Bridgend Morganwg (Mental)—Jr Reg
(psychiatry)
Bristol. Frenchay—H.S (A/B2) neuro
surg
Bristol S Western R H.B—Reg (B1)
Blood Transfusion Service
Bristol United & S Western R.H B—Cons
Genito urinary Surg
Bromsgrove All Saints—H.S.s H.P
Bradford Royal Infy—Reg (B1) orth
Bideford & Dist—H O (B2)
Beverley Yorks Westwood—H.S (A/B2)
Bury St. Edmunds W Suffolk Gen—
H.S (A B2) cas & orth H S (B2)
gyn & obst
Burnley Gen.—H O (A) surg Jr E.N T
Reg (B1)
Burnley Victoria—H S Jr Ophth Reg.
Orth H S

Burnley Bank Hall Maty—Obst O (B2)
Bury Gen—C O (B2) H.S (A B2)
Cardiff United—Reg (radiotherapy) H.S.s
(orth & radiotherapy)
Carmarthen W Wales Gen—H.S (A/B2)
Castleford Normanton & Dist—R.S O
(B1) Jr Reg
Chartham Down St Augustine's—Jr
M.O (B1)
Chelmsford & Essex & St Johns—H S
(B2) Special Depts
Chelmsford St. Johns—Jr Med. Reg (B1)
Chelmsford Broomfield—Med Reg
Chelmsford & Essex—H.P (A)
Cheltenham Gen Eye & Children's—
R.M O (B2)
Chester City Hosp & Royal Infy—Med
Reg (B1) gen med & cardiac
Chester Royal Infy—Jr H.M.O (B1)
orth cas
Chorley & Dist—Surg Jr Reg (B1)
Colchester Royal Eastern Counties—Sr
Reg (B1) Jr H.M O s
Coventry & Warwickshire—Reg (gyn. &
obst) H S (A/B2) Central Accid. Unit
Canterbury Kent & Canterbury—H.S
(B2) E N T & E
Cambridge Addenbrooke's—Sr Reg
(Radiotherapeutic Centre)
Darlington Mem—C O (A/B2)
Davyhulme Park—Obst H O (A/B2)
Med Reg (B1)
Dewsbury & Dist Gen Infy—H.S (A)
Dudley Guest—H.S (A/B2) C.O (A/B2)
Eccles & Patricroft—H O (A/B2)
Epsom. Horton—H.P
Enfield Chase Farm—H.S (A) gen. surg
Exeter Royal Devon & Exeter—C O &
H.S (A/B2) E N T
Exeter Princess Elizabeth Orth.—H O.s
(A/B2) Male orth & frac
Griffithstown County—Jr H.M.O (obst.
& gyn)
Grimsby Gen.—C O (B1) Jr Reg
Guildford Royal Surrey County—Gyn
H.S (A/B2)
Gloucester S Western R.H B—Med.
Dir (Mass Radiogr Unit)
Halifax Area H.M.C—H P (A/B2)

Halifax Gen—H S (B2)
Halifax Royal Infy—Jr Reg, (oas & orth) H P (B2) Male
Hailsham Hellingly Mental—H O (A/B2)
Harrogate Royal Bath—R M.O (B2)
Hastings Group H M.C—H O (A/B2), med Female
Haverfordwest Pembroke Cty War Mem—R S O (B1), H S (A/B2)
Hemel Hempstead West Herts—C O & H S (A/B2)
Heswall Cheshire Cleaver—Jr H M.O (B1)
High Wycombe War Mem—H O (B2), surg
Huddersfield Royal Infy—Radiol Reg (B1) Jr Reg (B1), E N T Jr Reg (B1) cas
Hull Royal Infy—Orth H S (B2) E N T H S (A/B2)
Hull Victoria Hosp Sick Children—H P (A/B2)
Hull Victoria Hosp Sick Children—H S s (A/B2)
Hounslow—H S (B2) Special Depts
Hereford Gen—H P (A/B2) H S (B2), cas E N T & frac
Isleworth West Middlesex—Phys
Isleworth West Middlesex—Ophth Surg (Cons)
Ipswich Isolation—H O (A/B2)
Kettering Gen—H S (A/B2), traum & orth
Lanchester, Durham Maiden Law—H S (A/B2), E N T
Leamington Warneford Gen—H S (B2) E N T & ophth. H S (A)
Llanelly—Jr H M.O.s (gen surg & gyn, med & anæs E N T & ophth.)
Liverpool Royal L'pool Childrens—Med Reg (City Branch)
Liverpool 20 Bootle Gen—H S H P C O (A/B2 posts)
Macclesfield Parkside—Psych Reg (B1)
Macclesfield & Dist.—Anæs Reg (B1)
Macclesfield Infirmary Bch.—Jr Surg Reg (B1) Anæs Reg (B1)
Maidstone Lenham San—R M.O Reg Locum
Maidstone West Kent Gen—C O (A) H S.s (B2) H.P s (B2)
Manchester R H B—Cons Asst Radiol
Manchester R H.B (Rochdale Hosp Centre)—Cons Anæs
Manchester R H B—Anæs (Sr H M.O) Asst Radiol. (Sr H M.O)
Manchester United—R.M O (B1) Reg or Jr Reg, Regs (diag radiol)
Mansfield & Dist Gen—Sr H S (B2), accid. & orth H S (A/B2)
Morpeth N thumb St Mary's—Sr Reg (B1)
Middlesbrough West Lane—H O (A/B2)
Middlesbrough Yorks N Riding Infy—Locum Asst Anæs
Newcastle United—Ophth Surg
Newcastle Royal Victoria Infy—M.O (Sr Reg)
Newcastle R H B, Hartlepools Group—Reg (orth)
Newcastle R.H.B, Wansbeck Group—Cons Asst Surg
Newcastle R H B E Cumberland—Surg Reg
Newport Royal Gwent.—H O (derm & V D) H O (A/B2) orth H O (A/B2) E N T & ophth
Nottingham Gen—Jr Aural Reg Orth Reg (accid & orth) Aural H.S (A)
Nottingham City—H.S (A/B2) Jr Reg (B1), thor surg Pæd H P (B2) H P (A/B2)
Nottingham Firs Maternity—Obst. H S (B2)
Northampton Gen—Sr Anæs Reg (B1)
Norwich W Norwich & Isolation—H P (A/B2)
Nuneaton Hospitals—H S (gyn & obst)
Nuneaton Manor—H S (A/B2)
Old Windsor—H P (A/B2), pæd
Pontefract Gen Infy & The Hydes—R S O (B1) Jr Reg H P (A) H S (A)
Portsmouth St Mary s—H.S (A) Male
Potters Bar & Dist—H.O (A/B2) med & surg
Preston Royal Infy—Orth H S (A/B2)
Preston Royal Infy—Anæs H O (B2) Jr Reg (B1) orth & traum, Jr H O (A/B2) orth & traum
Peterborough Mem—H S (A/B2)
Plymouth. S Devon & E Cornwall—H S (B2) obst. & gyn
Pendlebury Royal Manchester Childrens—H P s (B2)
Pontypridd Church Village Gen—Reg (surg), H O (B2) surg H O (A), med, Reg (diag X ray), Reg (anæs)
Reading H M C—Reg (B1) E N T
Rochdale Birch Hill—Obst & Gyn H S (A/B2)
Rochford Gen—H S (A/B2)
Rhondda Porth & Dist—Jr H M.O (surg) H O (A), mainly surg
Rotherham Moorgate Gen—Jr H.M O (B1) pæds & med
Rugby Hospital of St Cross—H.P (A/B2)
Salisbury Gen—H S (A/B2), H P (A/B2), Jr Reg (E N T)
Scotland Northern R H B—Sr Reg Anæs
Sheffield Children s Hosp Unit—H S s (A/B2)
Sheffield R H.B—Asst. Psych (Harmston Hall), Cons Orth Surg (Barnsley Rotherham and Mexboro)
Sheffield Jessop Hosp for Women—Jr Reg (path)
Sheffield Royal Infy Unit—Sr Med Reg (B1)
Sheffield Royal Infy Unit.—Reg (B1), clin path
Shrewsbury Royal Salop Infy—Orth H S & C O (A/B2)
Southampton Borough Gen—H S (A/B2)
Southampton Children s—H O (A/B2)
Southampton Royal-S Hants & So ton—H P (A/B2)
Southend-on-Sea Gen—Reg (B1) diag X ray
Southend-on Sea H M.C—Asst Chest Phys (Sr Reg)
Southend Gen—H.S (A/B2)
Southport Promenade—H S (A/B2)
Slough Upton—H.S (A/B2)
Sutton in Ashfield Notts—Asst Path
Shotts Lanarkshire Hartwood Mental—H O s
Staincliffe Gen—H.P (A/B2) derm & gen Jr Reg Surg; H O (A/B2) gen surg, H P (A/B2) with pæds H O (obst. & gyn)
Stamford & Rutland—C O & H P (A), H S (B2)
Stourbridge Corbett—H P (A/B2) C O (A/B2)
Taunton Musgrove Park—Sr H S (B2) gyn & obst.
Taunton Tone Vale—Sr Med Lab Tech
Taunton & Somerset—Jr H M O.s (B1)
Tilbury & Riverside Gen—Bl. Orsett.
Tilbury & Riverside Gen—[illegible] & acc); Tilbury H.P [illegible] Obst H.S (B2) Orsett.
Tunbridge Wells Dist—H. (A), orth
Uxbridge Hillingdon.—H.P [illegible]
Wakefield Stanley Royal Psychiatry
Wakefield Gen—Obst & [illegible]
West Bromwich & Dist Gen H S (A/B2)
Wigan Royal Albert Edw[illegible] H S (A/B2)
Winchester Royal Hants Co[illegible] (A/B2), pæds Anæs (A/B2)
Windsor King Edward VII.—Jr [illegible]
Woking Victoria—R.M O (A[illegible]
Wrexham & E Denbighshire W[illegible] H P (A/B2)
Wrexham Maelor Gen. & Wa[illegible] Inter Reg (B1) gen surg
Welsh R H B—M.O (Ile M[illegible] Radiogr Unit)
Worksop Victoria—C O (A/B[illegible] (A/B2)
Watford Peace Mem., Shrodells K[illegible] Maty—Cons Pred
Dunedin, N Z. Otago Hosp. B[illegible] (Eye Dept.)
Gisbourne, New Zealand Cook Board—Anæs. (Jr Spec or S[illegible]

PUBLIC HEALTH

Birmingham City Educ Com'te Sch M.O
Birmingham City—A.M.O.H (Gen. poses)
Board of Control Moss Side Ho Deputy Med. Supt. (Sr H.M.O)
Board of Control Rampton Ho Jr Reg (Depy Med Supt) Cons
Board of Control Moss Side [illegible] Locum M.O
Essex C C Saffron Walden B C & R[illegible] M O H & Asst C.M.O H
Grantown-on-Spey, Moray—Factor[illegible] tor
Gloucestershire C C.—Sr Asst. [illegible] M O H
H M Colonial Service, British G[illegible] Health Officer (Female)
Ministry/Pensions Leeds Chapel A[illegible] —Surg O.s (B1) Sr M.O
Ministry/Pensions Worcester, Rea[illegible] —Surg O (B1)
Ministry/Pensions Qn Mary's (F[illegible] ton)—Jr M.O (B1)
Ministry/Pensions Aylesbury Manderville—Surg O (Plastic Jaw Unit)
Middlesex C C Area 9—A M.O
Northumberland C C—A.C.M O.H & c w)
Rugby Warwick.—Factory Doct[illegible]
Stanford le Hope Essex—Factor[illegible]
Somerset C C—Asst County M.O

GENERAL PRACTICE

(Executive Councils Form E.C.[illegible]
Cardiganshire Crosswood/Llanilar—List 510
Halifax—Urban List 3275
Yorkshire West Riding Chapel[illegible] Wakefield—Chiefly Rural List
Yorkshire, West Riding Castle[illegible] Urban List 600

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A LIQUORICE EXTRACT WITH DEOXYCORTONE-LIKE ACTION *

IOLHUYSEN J GERBRANDY L A DE VRIES
arts Arts Chem Doctorand

J C DE JONG
Pharm Doctor

LENSTRA K P TURNER J G G BORST
potheker M.D Toronto M.D

the Department of Medicine, University of Amsterdam,
e Department of Pharmacy, Binnengasthuis Amsterdam

ING the war years Revers (1946) noticed that patients suffering from peptic ulcer improved taking a proprietary preparation purchased from l pharmacist in a small Netherlands town This ration was found to consist of a mixture of succus ithiæ, fructus anisi, and ferrum reductum Suppos hat the therapeutic effect was due to the liquorice, eated a series of gastric ulcer patients with a paste sting of 2 parts powdered succus liquiritiæ and 1 water The patients had to take one teaspoonful e times a day, on an empty stomach No restrictions iet or activity were imposed The majority of the ents became symptom free within a short time, ay examination revealed that sometimes a deep ulcer he lesser curvature disappeared within three weeks

n 1945 succus was no longer available In 1947 the ie favourable results could be obtained, but this time ous side-effects were observed, which had not been n before. Approximately 1 in 5 patients treated with paste developed œdema, usually noticed first in the e and later in other parts of the body Many patients nplained of headache, and some noticed shortness of ath on exertion and pain in the upper abdomen ivers 1948)

On reducing the dosage the symptoms usually subsided, t in some patients they remained so severe that the atment had to be discontinued Patients who had ce responded with œdema developed it again when e drug was given a second time But Dr Revers did it regard the reaction as allergic, for there was no se in the eosinophil-count and anti histamine drugs were effective He recalled having previously seen a case which œdema disappeared when the patient stopped ating sweets containing liquorice and returned as soon s she began to eat them again Another case of the ame kind was reported by Dr G van den Berghe at meeting in Amsterdam on Feb 25, 1950 Dr H Pannekoek mentioned a patient who had never had symptoms of cardiac failure but developed severe cardiac asthma after taking liquorice for his stomach complaints, and several similar cases have since been noted by Belgian and Dutch doctors

PRESENT INVESTIGATION

Succus liquiritiæ is a dried watery extract of the roots of *Glycyrrhiza glabra* It contains 15% protein substance, 5% glycyrrhizin, 40% "extractable" substances, % sugar, and 5% insoluble substance It is generally used by pharmacists to make pills and to mask un pleasant tastes (The quantities used for this purpose are, we have found, not much less than those known to provoke cardiac asthma in susceptible elderly people)

After Revers reported his findings investigations in the pharmacological institute of the University of Utrecht demonstrated that the drug had a powerful spasmolytic action and also prevented experimental production of gastric ulcers in rats and guineapigs Glycyrrhizin was shown not to be the active principle Administration of succus liquiritiæ to several species of animals failed to produce œdema, nor could any influence on water and sodium chloride metabolism be demonstrated (Nelemans Stamperius 1949)

Obviously the problem of the œdema had to be studied clinically The possible causes of generalised œdema are

1 Reduction of serum albumin to less than 60% of normal
2 Increased permeability of the capillary walls, reducing the effect of the colloid osmotic pressure of the serum-proteins
3 Disturbance of cardiac function leading to heart-failure
4 Primary retention of water and sodium chloride by the kidney, due to (*a*) damage to the kidney leading to a severe impairment of renal function, or (*b*) hyperfunction of the tubules reabsorbing water and sodium chloride excessively

As possibilities 1 and 4*a* were soon ruled out, we had to decide which of the three other mechanisms was responsible for the fluid retention They can be distinguished by the scheme shown in the following table, and in order to apply it we had to collect data on the changes in hæmoglobin, total proteins, venous pressure, blood pressure, and pulse pressure

SCHEME FOR ASCERTAINING CAUSE OF ŒDEMA

—	Hæmoglobin and total proteins	Venous pressure	Blood pressure (systolic)	Pulse pressure
Increased capillary permeability	Increased	Decreased	Decreased	Decreased
Primary heart failure	Decreased sometimes secondarily increased	Increased	Decreased or unchanged	Decreased or unchanged
Primary renal retention of water and sodium chloride	Decreased	Increased	Increased	Increased

During the past eighteen months we have given succus liquiritiæ to seven patients in our department who, in spite of long continued dieting and bed rest, had persistent symptoms and X ray evidence of gastric ulcer, and to three other patients So as to get reliable data on the electrolyte balance and on the time relations between the use of the drug and retention of water and sodium chloride, we gave eight of the ten patients a strictly standardised diet, consisting of exactly the same amounts of milk, biscuits, and butter, at three hourly intervals by day and by night, just meeting their calorie requirements Before receiving food at exactly midnight, 3 A.M, 6 A.M, &c, the patients passed urine All 8 specimens were measured and examined for chloride and for urea plus ammonia All the patients showed the excretory rhythm described elsewhere (Borst and de Vries 1950)

With each feed, the patients received supplements of constant amounts of sodium chloride and sodium bicarbonate

Having determined the pattern of excretion for several days, we started administering the drug, giving 20–45 g of succus liquiritiæ also divided into 8 equal parts daily All the patients responded in the same way, though there were striking quantitative differences As a rule the third specimen of urine was slightly, and the fourth definitely, smaller in amount than the corresponding specimens of previous days The chloride output decreased accordingly The excretion of urea plus ammonia did not decrease, nor did the urea clearance No albumin or abnormality of urinary sediment was found in any of the cases The blood-hæmoglobin level

* Based on a lecture read before a combined meeting of the Association of Belgian Physicians and the Association of Dutch Physicians The work was aided by a grant from the Dutch Foundation for Scientific Investigations

fell appreciably, while the venous pressure, pulse pressure, and systolic pressure increased significantly After a few days, intake and output were again in balance, but the patient had gained several kilogrammes in weight

None of our nine intensively studied patients developed clinical œdema but some of the patients treated with liquorice for gastric ulcer, who were attending the outpatient department, had definite œdema of the legs

Obviously the main effect of the drug was stimulation of the renal tubules to an excessive reabsorption of water and chlorides and probably also of sodium Results of similar magnitude and nature were obtained in a patient who received equivalent amounts product purified by dissolving the alcohol-soluble of succus liquiritiæ in water and producing a p by acidification This precipitate was redissolved water and ammonia and re precipitation resulted substance which consisted mainly of glycyrrhizin

In another patient ammonium glycyrrhizate, from a wholesale dealer, produced a marked ret extracellular fluid equal to that caused by the precipitated from a solution of succus liquiritiæ by hydrochloric acid On the other hand the ne filtrate when given in equivalent amounts to the

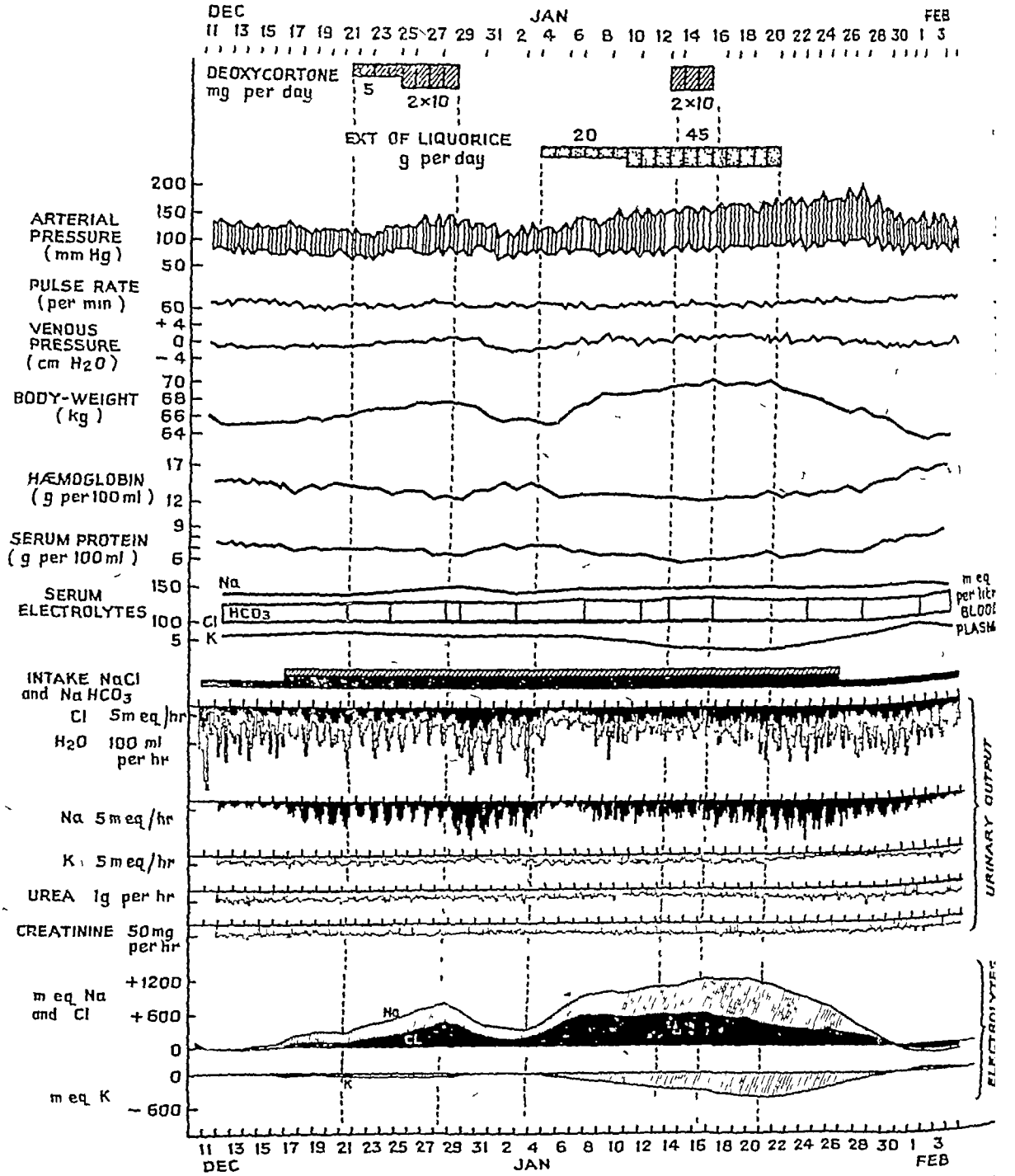

Fig 1—Three-hourly output of water sodium, potassium, urea and creatinine in an ulcer patient during 54 days Deoxycortone and especially liquorice produce a gain in weight, a positive sodium and chloride balance and a negative potassium balance together with a decrease in hæmoglobin and a rise in venous pressure arterial pressure and pulse-pressure Slight increase in blood-plasma chlorides and sodium sharp fall in blood potassium No influence on urea and creatinine

was totally inactive Therefore the œdema ing factor is either glycyrrhizin or some substance tated with it by acid

COMPARISON WITH DEOXYCORTONE

effects observed were in all respects similar to following injection of large doses of deoxycortone ajections of adrenocorticotropic hormone (A C T H) s now clear that succus liquiritiæ and the purified ct contained a substance with an action resembling of one of the two hormones and that this substance ctive when taken by mouth

gain more information, we studied in one case the ry output of sodium, potassium, and creatinine and ared the effect of a moderate and high dosage of ycortone with that of 20 and 45 g of succus ntiæ daily

lium and potassium in urine and food were determined a flame photometer Chloride was determined by the nitrate method of Laudat (1928) and in periods of high sis by the method of Asper et al (1947), checking it regularly by the silver nitrate method Urea plus-ammonia was determined according to Ambard (Bots 1941), creatinine according to a modified Folin method, hæmoglobin by the alkaline hæmatin method of Wu (1922) adapted to a photo electric colorimeter, and total protein with the copper sulphate specific gravity method (Philips et al 1943) Venous pressure was determined by the standardised Lewis method according to Allen (1948), and Borst and Molhuysen (1950) The plasma volume was determined with Congo red, the disappearance curve being determined from 10 samples of blood taken 5–15 minutes after injection

On the 2nd day of the observation period and on the 50th day (16 days after the withdrawal of drug therapy and 6 days after the withdrawal of the sodium and chloride supplement) the patient had the same weight We assumed that he had also on these days exactly the same amount of potassium, sodium, and chloride in his body fluids The average daily intake during these 49 days, based on food analyses, appeared to be (in milli equivalents) sodium 232, chloride 165, and potassium 113, and the average output was 220, 153, and 87 5 respectively The extrarenal loss must therefore

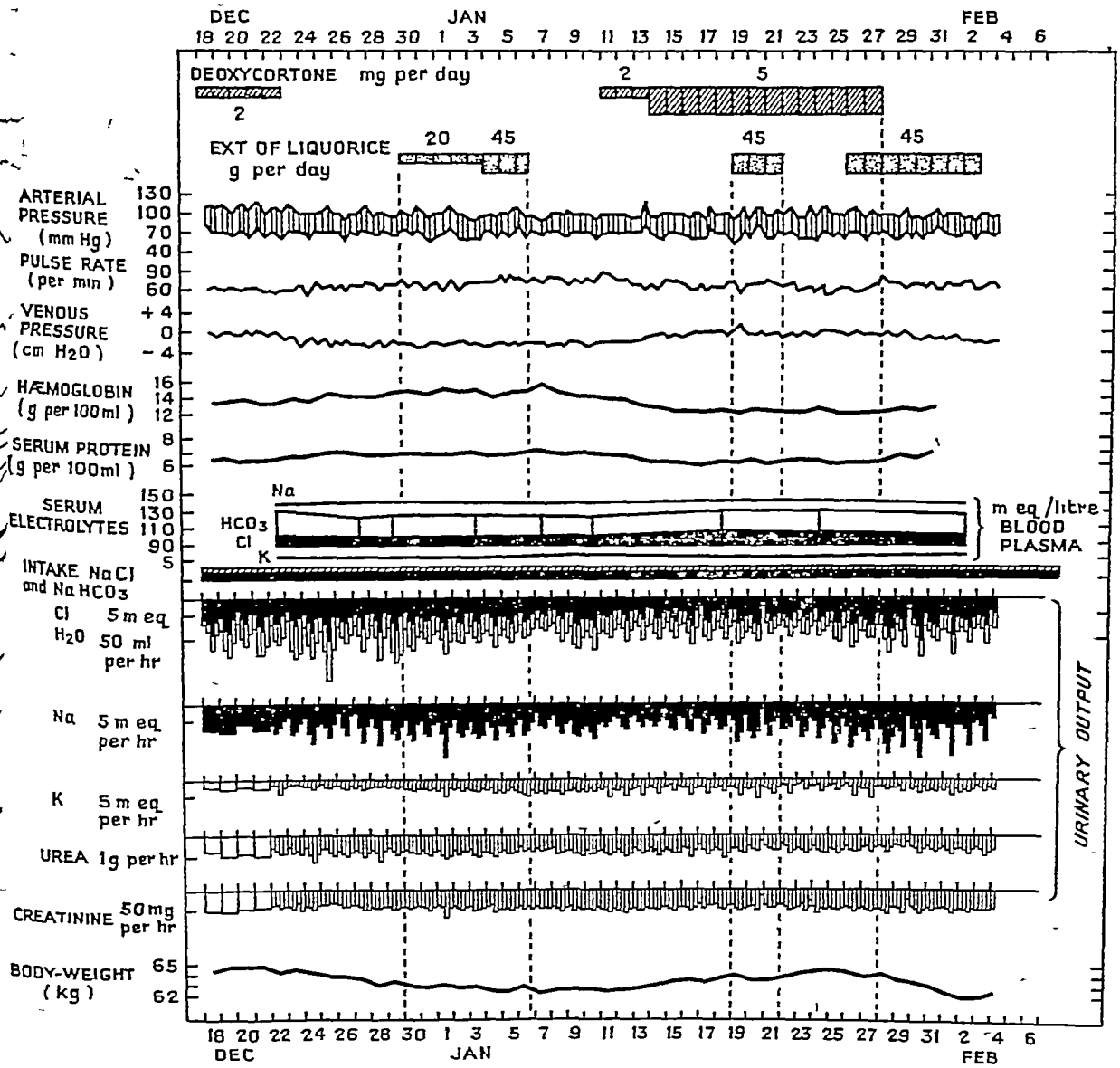

Fig 2—Six hourly output of water sodium chloride potassium urea, and creatinine in a patient with Addison s disease. Deoxycortone has a marked effect on weight, venous pressure hæmoglobin and total protein and a slight effect on electrolyte excretion Liquorice has no effect or a slightly opposite one.

have been sodium 12, chloride 12, and potassium 25 5 m eq , the figures being of the magnitude that can be anticipated when the urine is carefully collected To calculate the balance of the three electrolytes we assumed that not only the average, but also the actual, daily extra renal losses were 12, 12, and 25 5 m eq respectively The results are presented in fig 1 The patient happened to be a " strong reactor," and the effect of 20 g of succus liquiritiæ orally daily was quantitatively greater, though qualitatively the same, as that of two daily injections of 10 mg deoxycortone Both produced retention of water, sodium, and chloride, and this gave rise to the signs which overburdening of the circulation by extra cellular fluid causes in the presence of a normal i e , a fall in hæmoglobin and serum protein, a rise in venous pressure, a rise in systolic pressure, very marked rise in pulse pressure, without a ch the pulse rate, pointing to a substantial increase cardiac output

On Dec 20, Jan 25, and Feb 1 the respective volumes were 2320, 2370, and 1980, ml., and the globin levels 14 5, 13 4, and 16 1 g per 100 ml figures show that the fall in hæmoglobin truly an increase in plasma-volume

The usual increase in output of potassium by deoxycortone was also seen in this case,

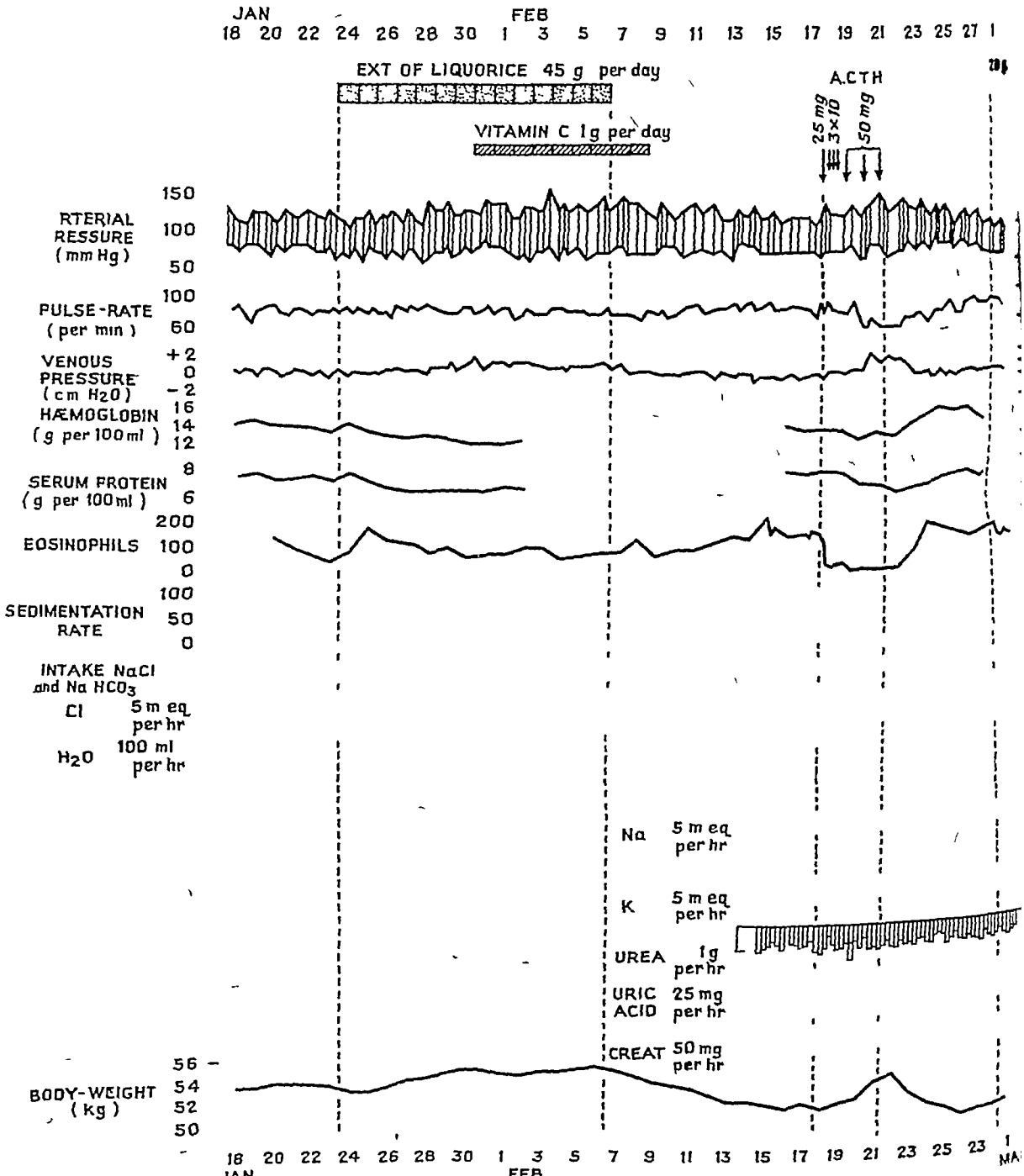

Fig 3—Effect of liquorice on water and chloride excretion body weight, hæmoglobin venous pressure arterial pressure eosinophil-count and sedimentation-rate in a patient with rheumatoid arthritis Effect of A.C.T H similar but more prompt and much stronger also prompt and strong response of eosinophils and sedimentation-rate.

t of deoxycortone was much exceeded by that of iquorice extract, which produced a strongly negative ssium balance At the same time the sodium nce was strongly positive, which could not be fully unted for by the increase in extracellular fluid shown he increase in weight and by the retention of chloride, by the slight increase in the plasma sodium level ı indicates that 450 m eq of potassium of the cells been replaced by sodium Ferrebee et al (1941), igh unable to demonstrate the negative potassium ance and the positive sodium balance in dogs injected ı 25 mg deoxycortone daily, found sodium replaced potassium in the muscles obtained by biopsy As in rebee's dogs, the potassium figures in the blood sma of our patients receiving liquorice were much reased The lowest value was 3 3 m eq per litre, ; this patient, who was in bed, did not complain of scle weakness Unfortunately, electrocardiograms re not made

During the treatment with liquorice no increase of ect could be obtained by injecting 10 mg deoxycortone ce daily It is highly probable that this was because ı cardiac output was already greatly increased An crease in cardiac output, unless accounted for by an crease in metabolism, is always followed by a rise in e urinary output of the three components of extra llular fluid (Borst 1938, 1941, 1948 Borst and de Vries 50) Hence, in subjects with normal heart and kidneys, e increase of extracellular fluids during long continued eatment with deoxycortone or succus liquiritiæ is self miting The diuretic effect, postulated by several uthors (Silvette and Britton 1938, Ragan et al 1940, errebee et al 1941, Malinos et al 1941, Gaunt et al 949, Roemmelt et al 1949) as due to the continued eoxycortone injections, and even leading to "diabetes isipidus," can be explained by this mechanism

There are a few differences in the effect of deoxycortone id succus liquiritiæ After discontinuing deoxycortone eatment, the rebound is very pronounced and starts ithin 24 hours of the last injection Discontinuance of ccus therapy is not followed by so impressive a rebound is 10 days before the weight, hæmoglobin, and venous essure are on the pre treatment level, indeed, the ood pressure remained high so long as the sodium supplement to the diet was given The retention of potassium, starting gradually after discontinuing succus therapy, becomes almost complete in the next 5 days

COMPARISON WITH A C T H

The above observations did not enable us to decide whether the action of the succus resembled that of deoxycortone or of A C T H, all the signs and symptoms observed in our patients can be produced by either hormone

Accordingly we started the treatment with succus in a patient with Addison's disease His diet was not so rigidly standardised, but we supplied daily exactly the same type of meals and fluids in the same quantities The food was prepared without salt The succus was of the same batch and was prepared on the same day and mixed with sodium bicarbonate and sodium chloride as in the first patient The findings are shown in fig 2 The patient had been on a daily injection of 2 mg of deoxycortone for a year After changing deoxycortone dissolved in oil to an injection of pure oil, there was no definite increase in the output of water, sodium, and chloride, nor was potassium output increased There must nevertheless have been a slightly negative balance of extracellular fluid, for his weight went down More pronounced and also prompt was the drop of the blood plasma volume, as shown by the rise in the level of hæmoglobin and especially the fall in venous pressure Then 20 g of succus was given daily for 6 days, the dose being later increased to 45 g a day Response to the treatment was not apparent, if there was any, it was negative After withdrawal of the drug, weight and plasma volume slightly increased

As it was possible that succus liquiritiæ only enhances the effect of the sodium conserving hormones of the adrenals, deoxycortone and liquorice were then given simultaneously First 2 mg of deoxycortone, and then 5 mg, was injected daily and after equilibrium had been established, liquorice was added for 3 days Deoxycortone produced a slight retention of chloride and sodium, the rise in weight and especially the fall in hæmoglobin and total proteins and the rise in venous pressure were striking The liquorice was again devoid of effect, there was even evidence that it was harmful Finally succus was given for a third period, and after 2 days we discontinued injections of deoxycortone, the patient continuing with succus only This time the effect of the withdrawal of hormone therapy was impressive, not only venous pressure, serum protein, and hæmoglobin reacted promptly, but also there was a significant increase in the output of chloride and especially of sodium, leaving no doubt of the total ineffectiveness of succus liquiritiæ in correcting the disturbance in the metabolism of water and electrolytes in this case of adrenal insufficiency

Though the patient could live on a normal diet without deoxycortone injections, he did not respond to A C T H either We injected 25 mg of A C T H from a batch that had proved to be very active in other patients There was no change in electrolyte or uric acid excretion, nor was there the slightest fall in eosinophil count (data not in figure)

Though we had observed patients with gastric ulcer who did not respond so strongly to succus as the patient whose data are presented in fig 1, we never saw a total absence of effect or a slightly negative effect as in the patient with Addison's disease This suggested that the action of succus liquiritiæ is mediated by the adrenals

To determine whether the drug has a complete A C T H action a patient with chronic rheumatoid arthritis was treated with the remedy It was a typical case of two years' duration, three courses of gold injections given in the department for rheumatic diseases had met with only temporary success All the joints of both the patient's hands were swollen, and he could not reach a glass of water from his side table without help There was a stiffness of arm and shoulder, hampering all movement The knee joints were swollen, and fluid could easily be demonstrated Treatment with amidopyrine 0 5 g three times daily brought some improvement, though the sedimentation rate did not decrease significantly Amidopyrine was next replaced by acetylsalicylic acid 0 5 g three times daily, and then all treatment was discontinued Three days later we started with 45 g of succus daily, stiffness being at its worst at that time After 33 hours the patient thought there was some improvement and declared that he was as well as under treatment with amidopyrine Objectively, however, the results were not impressive, though he could move a little better His grip was not improved when measured by ergometer Injections of ascorbic acid, given with succus treatment, were without effect

The retention of water and sodium chloride was not as striking as in the patient with gastric ulcer described above, but there was a definite decrease in chloride and water output and the other signs of retention of extracellular fluid were also present (see fig 3) Withdrawal of the drug was followed by a negative water and chloride balance and also by a decrease in venous pressure At this time the patient was complaining of a severe exacerbation of his disease, and was completely incapacitated, but after a few days there was some improvement Then we started with A C T H, the first injection being 25 mg After 6 hours he could sit unassisted, move his arms

have been sodium 12, chloride 12, and potassium 25 5 m eq, the figures being of the magnitude that can be anticipated when the urine is carefully collected. To calculate the balance of the three electrolytes we assumed that not only the average, but also the actual, daily extra renal losses were 12, 12, and 25 5 m eq respectively The results are presented in fig 1 The patient happened to be a "strong reactor," and the effect of 20 g of succus liquiritiæ orally daily was quantitatively greater, though qualitatively the same, as that of two daily injections of 10 mg deoxycortone Both produced retention of water, sodium, and chloride, and this gave rise to the signs which overburdening of the circulation by extra cellular fluid causes in the presence of a normal i e, a fall in hæmoglobin and serum protein, a m rise in venous pressure, a rise in systolic pressure, very marked rise in pulse pressure, without a change the pulse rate, pointing to a substantial increase cardiac output

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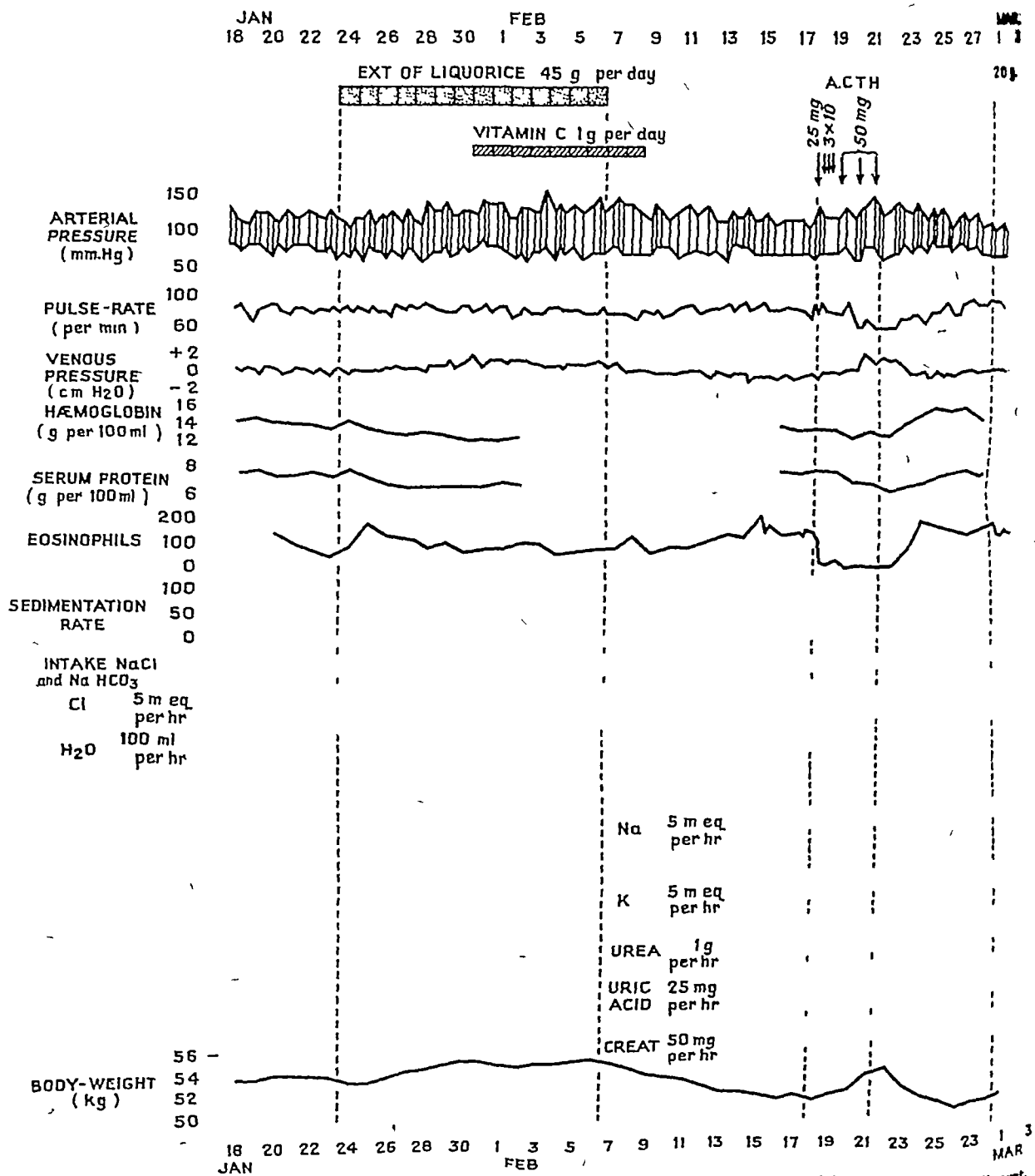

Fig 3—Effect of liquorice on water and chloride excretion body weight, hæmoglobin venous pressure arterial pressure eosinophil-count, and sedimentation-rate in a patient with rheumatoid arthritis Effect of A.C.T H similar but more prompt and much stronger; also prompt and strong response of eosinophils and sedimentation-rate.

of deoxycortone was much exceeded by that of liquorice extract, which produced a strongly negative sodium balance. At the same time the sodium balance was strongly positive, which could not be fully accounted for by the increase in extracellular fluid shown by the increase in weight and by the retention of chloride. The slight increase in the plasma-sodium level indicates that 450 m.eq. of potassium of the body have been replaced by sodium. Ferrebee et al. (1941) although unable to demonstrate the negative potassium balance and the positive sodium balance in dogs given 25 mg. deoxycortone daily, found sodium replaced potassium in the muscles obtained by biopsy. As in Ferrebee's dogs the potassium figures in the blood plasma of our patients receiving liquorice were never increased. The lowest value was 3.3 m.eq. per litre. In this patient, who was in bed, did not complain of muscle weakness. Unfortunately, electrocardiograms were not made.

During the treatment with liquorice no increase of urine could be obtained by injecting 10 mg. deoxycortone daily. It is highly probable that this was because cardiac output was already greatly increased. An increase in cardiac output, unless accounted for by an increase in metabolism, is always followed by a rise in urinary output of the three components of extracellular fluid (Borst 1938, 1941, 1948; Borst and de Vries 1949). Hence in subjects with normal heart and kidneys, increase of extracellular fluids during long-continued treatment with deoxycortone or succus liquiritiæ is self-limiting. The diuretic effect postulated by several authors (Silvette and Britton 1938, Pagan et al. 1940, Ferrebee et al. 1941, Malinow et al. 1941, Gaunt et al. 1949, Poemmelet et al. 1949) as due to the continued deoxycortone injections, and even leading to "diabetes insipidus," can be explained by this mechanism.

There are a few differences in the effect of deoxycortone and succus liquiritiæ. After discontinuing deoxycortone treatment, the rebound is very pronounced and starts within 24 hours of the last injection. Discontinuance of succus therapy is not followed by so impressive a rebound. For 10 days before the weight, hæmoglobin and venous pressure are on the pre-treatment level; indeed, the blood pressure remained high so long as the sodium supplement to the diet was given. The retention of sodium, starting gradually after discontinuing succus therapy, becomes almost complete in the next 5 days.

COMPARISON WITH A.C.T.H.

The above observations did not enable us to decide whether the action of the succus resembled that of deoxycortone or of A.C.T.H., all the signs and symptoms observed in our patients can be produced by either hormone.

Accordingly we started the treatment with succus in a patient with Addison's disease. His diet was not so strictly standardised, but we supplied daily exactly the same type of meals and fluids in the same quantities. The food was prepared without salt. The succus was of the same batch and was prepared on the same day and mixed with sodium bicarbonate and sodium chloride as in the first patient. The findings are shown in fig. 2. The patient had been on a daily injection of 2 mg. of deoxycortone for a year. After changing deoxycortone dissolved in oil to an injection of pure oil, there was no definite increase in the output of water, sodium, and chloride, nor was potassium output increased. There must nevertheless have been a slightly negative balance of extracellular fluid, for his weight went down. More pronounced and also prompt was the drop of the blood-plasma volume, as shown by the rise in the level of hæmoglobin and especially the fall in venous pressure. Then 20 g. of succus was given daily for 6 days, the dose being later increased to 45 g. a day. Response to the treatment was not apparent; if there was any, it was a negative. After withdrawal of the drug weight and plasma volume sharply increased.

As it was possible that succus liquiritiæ only enhances the effect of the sodium-conserving hormones of the adrenals, deoxycortone and liquorice were then given in small amounts. First 2 mg. of deoxycortone, and then 5 mg. was injected daily, and after equilibrium had been established liquorice was added for 3 days. Deoxycortone produced a slight retention of chloride and sodium, the rise in weight and especially the fall in hæmoglobin and total proteins and the rise in venous pressure were striking. The liquorice was again devoid of effect; there was even evidence that it was harmful. Finally succus was given for a third period, and after 2 days with discontinued injections of deoxycortone, the patient continuing with succus only. This time the effect of the withdrawal of hormone therapy was impressive, not only venous pressure, serum protein, and hæmoglobin rising promptly, but also there was a significant increase in the output of chloride and especially of sodium, leaving no doubt of the total ineffectiveness of succus liquiritiæ in correcting the disturbance in the metabolism of water and electrolytes in this case of adrenal insufficiency.

Though the patient could live on a normal diet without deoxycortone injections, he did not respond to A.C.T.H. either. We injected 25 mg. of A.C.T.H. from a batch that had proved to be very active in other patients. There was no change in electrolyte or uric acid excretion, nor was there the slightest fall in eosinophil-count (data not in figure).

Though we had observed patients with gastric ulcer who did not respond so strongly to succus as the patient whose data are presented in fig. 1, we never saw a total absence of effect or a slightly negative effect as in the patient with Addison's disease. This suggested that the action of succus liquiritiæ is mediated by the adrenals.

To determine whether the drug has a complete A.C.T.H. action a patient with chronic rheumatoid arthritis was treated with the remedy. It was a typical case of two years' duration; three courses of gold injections given in the department for rheumatic diseases had met with only temporary success. All the joints of both the patient's hands were swollen, and he could not reach a glass of water from his side-table without help. There was a stiffness of arm and shoulder hampering all movement. The knee joints were swollen, and fluid could easily be demonstrated. Treatment with amidopyrine 0.5 g. three times daily brought some improvement, though the sedimentation rate did not decrease significantly. Amidopyrine was next replaced by acetylsalicylic acid 0.5 g. three times daily, and then all treatment was discontinued. Three days later we started with 45 g. of succus daily, stiffness being at its worst at that time. After 33 hours the patient thought there was some improvement and declared that he was as well as under treatment with amidopyrine. Objectively, however, the results were not impressive, though he could move a little better. His grip was not improved when measured by ergometer. Injections of ascorbic acid given with succus treatment, were without effect.

The retention of water and sodium chloride was not as striking as in the patient with gastric ulcer described above, but there was a definite decrease in chloride and water output and the other signs of retention of extracellular fluid were also present (see fig. 3). Withdrawal of the drug was followed by a negative water and chloride balance and also by a decrease in venous pressure. At this time the patient was complaining of a severe exacerbation of his disease and was completely incapacitated, but after a few days there was some improvement. Then we started with A.C.T.H., the first injection being 25 mg. After 6 hours he could sit unassisted, move his arms

freely, take things from the side table, and eat without help The situation did not change as long as ACTH was given, but 2 days after the last injection of the pituitary hormone all the incapacitating symptoms came back After another 4 days liquorice treatment was resumed This time there was not even any subjective improvement, though the effect on the electrolytes was as usual, and potassium in the blood fell to 3 4 m eq per litre (data not included in fig 3) Uric acid excretion, which had increased by 25% during ACTH treatment, was unchanged

The effect of ACTH on water and electrolyte balance was much greater than the effect of succus, but the resemblance to the response of a strong reactor to succus, as demonstrated in fig 1, is clear The retention of sodium and chloride is more complete after ACTH, but the same tendency to establish a new balance as a result of the increased blood volume, venous pressure, and cardiac output is demonstrated by the increase of chloride and sodium excretion on the 4th day of treatment There is, however, a difference in the prompt rebound after discontinuance of ACTH injections The increase in the output of potassium with ACTH is lacking, but there is a retention during the "rebound" On the day we started the first course of liquorice there was a sharp, unexplained rise in the eosinophils, followed by a gradual decline that turned into a gradual rise after the treatment was stopped ACTH brought the number down to virtually nil within 6 hours of the first injection The rebound came 36 hours after the last injection Resumption of liquorice was not followed by a definite decline The sedimentation rate (Wintrobe), which had been continuously over 100 mm in one hour in the 4 weeks before treatment with succus, showed during the use of the drug a downward trend which was not very pronounced and could not compare with the results of ACTH treatment The second time the same tendency towards lower figures was not observed, but there was again a rise after withdrawal of the drug

It may be that strong reactors would have shown a greater fall in eosinophils and sedimentation rate, and a more definite improvement In three students, following the use of 30 g of succus, a fall in eosinophils of nearly 20% was found, being most marked 36 hours after the succus had been taken, but not exceeding spontaneous short lasting fluctuations seen in the same subjects It may be that they were weak reactors for none had shown the considerable gain in weight that Revers regularly saw in specially sensitive subjects, even after the use of smaller quantities of succus

SOME QUESTIONS

Many questions remain to be answered

1 What is the active principle of succus liquiritiæ ?
2 Are the differences in response due to differences in destruction by the juices of the digestive tract, to differences in absorption, or to considerable differences in individual sensitivity to the drug ?
3 Can succus or the active principle, be given without harm by injection, and what will be the effect ?
4 Is the deoxycortone like effect seen in eight subjects with intact adrenals but totally absent in a patient with Addison's disease, the result of stimulation of the adrenals ? If it is why is the influence of liquorice extract on eosinophils and uric acid excretion, and on the symptoms of a patient with rheumatoid arthritis negligible or absent ?
5 Is the output of 17 ketosteroids substantially increased in patients who react to the use of liquorice by a considerable retention of extracellular fluid ?

Some of these problems raise again the question of the existence and function of cortical adrenal hormones with a pure deoxycortone like action, which, unlike 'Cortisone' and Compound F, do not affect carbohydrate metabolism, influence eosinophils and uric acid, or rheumatoid arthritis

SUMMARY

1 Observations of Revers that in a considerable proportion of normal people liquorice medication followed by œdema are confirmed

2 Even when no clinical œdema developed, the use of the drug resulted in retention of water, sodium and chloride Hæmoglobin and total serum protein decreased, venous pressure, blood pressure, and pulse pressure rose considerably, and the output of potassium was much increased The results were consistent in nine subjects with normal adrenals

3 In a patient in whom the sodium and potassium balance was determined, a replacement of 450 mg of intracellular potassium by an equal amount of sodium could be shown The blood potassium level fell to 3 m eq per litre

4 The harmful effect (especially in the case of potassium loss on the myocardium, which is overburdened by the increased venous pressure and by the considerable rise in blood pressure, is emphasised. The occurrence of cardiac asthma in subjects using liquorice in sweets or in drugs is fully explained

5 The effect of a liquorice extract by mouth is in almost all respects similar to that of injections of large doses of deoxycortone, but it lasts longer The blood pressure tends to remain raised after discontinuance of the drug, unless a salt free diet is given

6 In subjects with normal heart and kidneys the retention of water and sodium chloride during treatment with deoxycortone, ACTH, or succus liquiritiæ is seldom limiting, because the rise in venous pressure leads to an increase in cardiac output, which induces a salt diuresis

7 A patient with Addison's disease not responding to ACTH did not respond positively to succus liquiritiæ indeed there was a slight negative response

8 A patient with rheumatoid arthritis responded favourably to ACTH showed only an insignificant improvement, or none, after the use of succus liquiritiæ

We are indebted to head nurses A. van Putten and W L. Sipkes, to Miss E Knol, and to the technicians Misses J Daatselaar, L Quelle, E Mollema, R Buitenhuis, F Welkhof, and D Doyer, for invaluable assistance

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DIAGNOSTIC VALUE OF CREASED URINARY OUTPUT OF ADRENALINE AND ADRENALINE IN PHÆOCHROMOCYTOMA

ENGEL
M.D
W MED CAL WARD,
F HOSPITAL, FALUN

U S VON EULER
M.D
PROFESSOR OF PHYSIOLOGY
FACULTY OF MED CINE, STOCKHOLM

diagnosis of phæochromocytoma is still considered intricate and difficult, in spite of several recent contributions such as the histamine and benzodioxane (Roth and Kvale 1945 Goldenberg et al 1948) demonstration of an increased production of really active catechol derivatives which should form basis for a rational diagnosis, has hitherto not been achieved

has been shown that adrenaline and other catechol derivatives, when administered to man, are partly excreted through the urine in a conjugated form presumably as sulphate esters (Richter 1940) A certain amount of catechol derivatives is also normally secreted through urine, as shown by Holtz et al. in 1947 (urosympathin) which was supposed to consist of a mixture of hydroxytyramine, adrenaline, and noradrenaline

Since catechol derivatives may be extracted from urine and estimated quantitatively in a comparatively simple way (Euler and Hellner 1950) it appeared that an increased formation and output of such substances could be used as a basis for the diagnosis of phæochromocytoma After acid hydrolysis of the urine and adsorption on alumina, the catechols in normal urine could be shown, by biological estimation, to consist largely of noradrenaline (Euler 1948–49, Euler and Hellner 1950 Kroneberg and Schümann 1950) In two suspected cases of phæochromocytoma observed in the medical ward of the County Hospital of Falun the urine was subjected to catechol estimation by the technique of Euler and Hellner (1950)

Case 1 —A woman born 1901 Albuminuria at 13 after a common cold and in connection with her three pregnancies high blood pressure noted 1935–39 when treated at a psychiatric hospital Glucosuria 1947 Attacks of tachycardia, pallor and vomiting on five occasions since September, 1948. During the last two observed attacks the blood-pressure fell from about 250 to 125 mm Hg systolic. Basal metabolic rate (B.M.R.) constantly high, maximally — 155% Fasting blood-sugar maximally 358 mg per 100 ml. glycosuria at intervals No acidosis or polyuria.

Case 2 —A woman born 1906 Complained of palpitations at nights when examined in March 1948 B.P 170/110 One year later re-examination and suggestion of thyrotoxicosis B.M.R. — 140–150% Hyperglycæmia and altered glucose tolerance test B.P during time of observation at hospital in 1949 165–200 systolic and 110 diastolic No paroxysmal spells of hypertension observed

The following figures illustrate the results of urine analysis

Case	Date 1950	Urinary adrenaline (μg per 24 hours)	Urinary noradrenaline (μg per 24 hours)	Percentage of adrenaline in total
1	Jan 13	15	543	2 7
	Feb 20	54	1240	4 0
	March 8	21	973	2 2
2	Jan. 20	250	113	69
	Feb 20	780	680	54
	April 10	110	223	33

Compared with the normal urinary noradrenaline adrenaline output of 20–40 μg. per day, the figures were very greatly increased in these two cases, indicating catechol-producing tumours Operation was performed in case 1 on March 14 and in case 2 on April 11 (Dr Tolagen) In the first case a tumour weighing 48 g was removed situated at the bifurcation of the abdominal aorta Histological examination showed a typical phæochromocytoma It contained 4 5 mg per g of noradrenaline and less than 0 05 mg per g of adrenaline. In the second case a tumour weighing 20 g was removed from the left suprarenal. Malignancy could not be excluded It contained 0 75 mg per g of adrenaline and 0 75 mg per g of noradrenaline. The relative contents of the catechols in the two tumours were also borne out by paper-chromatography

It is noteworthy that the proportions of noradrenaline and adrenaline in the urine were approximately the same as in the tumours. As in the cases of Holton (1949) and Goldenberg et al (1949), the relative amount of catechols in the tumours showed wide variations

After removal of the tumours the catechol output in urine fell quickly to normal in both cases

SUMMARY

By estimating the total output of noradrenaline and adrenaline in the urine a reliable diagnosis of phæochromocytoma may be obtained This is illustrated by observations on two cases successfully treated by operation and histologically verified

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REFRACTORY HYPOCHROMIC ANÆMIA AND STEATORRHŒA

TREATMENT WITH INTRAVENOUS IRON

C F HAWKINS
M.D Lond , M.R C.P
SENIOR MEDICAL REGISTRAR

A L P PEENEY
M.R C.S
TUTOR IN CLINICAL PATHOLOGY,
UNIVERSITY OF BIRMINGHAM ,
DIRECTOR OF CLINICAL
PATHOLOGY

W TREVOR COOKE
M.A , M.D Camb.,
F.R C.P
READER IN MEDICINE
IN THE UNIVERSITY
ASSISTANT PHYSICIAN

QUEEN ELIZABETH HOSPITAL, BIRMINGHAM

THE report by Nissim (1947) of an effective preparation of iron which could safely be injected intravenously led us to search for examples of the rare refractory type of hypochromic anæmia, which though resistant to iron by mouth will respond to the intravenous injection of organic iron compounds (Slack and Wilkinson 1949) Little is known about the cause of the refractoriness, and it remains to be shown whether there are differences in the clinical manifestations or in the morphology of the blood which will distinguish the refractory type from other iron deficiency anæmias

SELECTION OF CASES

There are many reasons why a hypochromic anæmia may appear to be refractory to iron by mouth, so the following criteria must be satisfied before this can be established

1 A potent preparation of iron must have been used
2 Full dosage must have been taken and tolerated for an adequate period
3 The presence of hæmorrhage chronic infection renal failure and hypoplasia must have been excluded

Our patients had received ferrous sulphate gr 10 t d s by mouth for at least eight weeks without there being any significant rise in the red cell count or hæmoglobin values Precautions had to be observed to

ensure that ferrous sulphate was indeed the preparation taken, since other patients responded satisfactorily to iron by mouth when ferrous sulphate was substituted for the proprietary preparations previously prescribed, some of which are known to contain inadequate quantities of iron The patient's statement that his fæces had become dark was accepted as an indication that iron had been taken, because it takes at least gr 10 of ferrous sulphate daily to change the colour of the fæces Absence of vomiting and diarrhœa was regarded as evidence of tolerance of iron Finally, all these patients were admitted to hospital for varying periods before intravenous therapy, so that infection, renal failure, and excessive blood loss could be excluded and bone-marrow films examined

Six truly refractory cases were found five women and one man All these patients had defective fat absorption, as shown by abnormal fat balance tests (Cooke et al 1946), and X ray examination of the small intestine showed evidence of a "deficiency pattern" Our purpose here is to draw attention to the association of refractory hypochromic anæmia with steatorrhœa

HÆMATOLOGY

Peripheral blood films in four of these cases were typical of hypochromic anæmia associated with steatorrhœa (Bennett et al 1932) The red cells showed considerable variation in depth of staining, with conspicuous anisocytosis and moderate poikilocytosis In general the smaller erythrocytes were hypochromic, whereas the larger cells were often normochromic and in four cases were obviously macrocytic, the so called dimorphic picture Target cells were present in various numbers in four cases In cases 1 and 5 Price Jones curves showed the mean cell diameters to be 7 38 μ and 7 95 μ In the remaining two patients, one of whom possibly had chronic pancreatitis, the peripheral blood picture was indistinguishable from that of idiopathic hypochromic anæmia

Sternal marrow was examined in five of the six patients, and all showed erythroblastic hyperplasia, in which there was a variable mixture of small deformed iron deficiency normoblasts and large atypical normoblasts The small deformed normoblasts appeared identical with those seen in idiopathic iron deficiency anæmias, whereas the larger forms were intermediate in size between typical normoblasts and megaloblasts, were prematurely hæmoglobinised, and at the polychromatic stage did not show the same degree of condensation of nuclear chromatin as in typical normoblasts at the same stage of development (Cooke et al 1948) These larger normoblasts closely resembled those considered by Israëls (1941) to indicate intermediate erythropoiesis The reticulocytes in all the cases were within normal limits

TREATMENT

Iron was given intravenously in the form of 'Ferrivenin,' containing 100 mg in 5 ml The initial dose was 20 mg, this was followed by 60 mg and then repeated doses of 100 mg until the estimated total dosage was reached

Inpatients (three cases) received injections daily and outpatients twice weekly Reactions to the treatment were slight, the worst being a severe lower backache, coming on suddenly 3–4 minutes after the injection and radiating round both sides of the abdomen for a few seconds This occurred in three cases on several occasions and may have been of renal origin Thrombosis of veins followed only 2 out of 130 injections

CASE RECORDS

Case 1 —A man aged 51 Insidious onset of diarrhœa in 1935, with bulky pale slimy stools, aggravated by fatty food, followed by a severe attack in 1936 Gastrojejunostomy performed in 1937 for pyloric stenosis from duodenal ulcer No further dyspepsia but loose stools continued In bad health for last 14 years with loss of weight weakness and fainting turns, difficulty in swallowing sore tongue, and erythematous papular rash at pressure points Bleeding piles cured by injection in 1936, no other evidence of blood loss counts showed hypochromic anæmia continuously since with no response to iron by mouth Took ferrous sulphate and ferric and ammonium citrate in large doses every year from 1940 to 1949 but with no rise in Hb or significant change in mean corpuscular hæmoglobin concentration (25%) Ascorbic acid, liver preparations, and folic acid had no effect, and from 1944 he was admitted twice yearly for massive blood transfusions With this treatment he could just manage to do work as an accountant

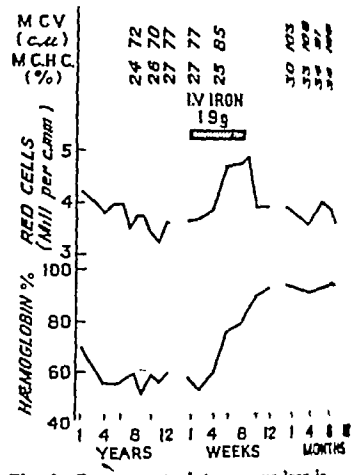

Fig 1—Response to intravenous iron is

He had observed koilonychia of his fingers and toes for many years The hollows were unaffected by iron by mouth but became more shallow after blood transfusion and disappeared as the anæmia responded to intravenous iron

On admission, he was thin and asthenic, height 5 ft 1 in, weight 9 st 2 lb, no sign of organic disease apart from anæmia

Investigations —Fat-absorption 60–85% Fractional test-meal showed histamine fast achlorhydria Glucose tolerance test normal Blood proteins 5 6 g per 100 ml (albumin/globulin ratio normal) Van den Bergh reaction negative Blood calcium and cholesterol normal X ray films of chest normal

Response to Treatment —This was a case of hypochromic anæmia, closely observed for 14 years, which had not responded to ferrous sulphate by mouth, given on numerous occasions as an inpatient and outpatient There was a good response to 1 9 g of iron intravenously, but a macrocytic anæmia appeared and has remained constant for a year with no further treatment The steatorrhœa may have resulted from the gastrojejunostomy but probably preceded it

Case 2 —A woman aged 31 Chronic lassitude, worse since birth of baby three years previously, with sore tongue and cracked lips for many years, and some difficulty in swallowing solids Loose stools all her life, 2–4 times daily, pale and porridge like No abnormal blood loss Idiopathic steatorrhœa was diagnosed from a blood film before a dental extraction

On admission she was small and slightly built, height 4 ft 11 in, weight 7 st 1 lb Well marked pallor of mucous membranes Angular stomatitis and atrophic tongue, without ulceration No koilonychia or finger clubbing General examination normal

Investigations —Fat-absorption 70% and flat chylomicrograph Fractional test meal showed low acidity Glucose tolerance curve normal Blood proteins 7 g per 100 ml (albumin/globulin ratio normal) Serum calcium and serum phosphorus normal

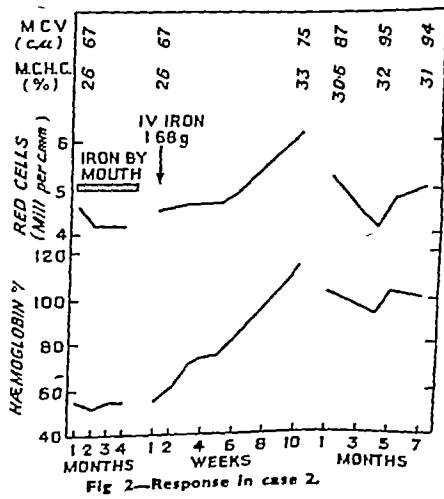

Fig 2—Response in case 2

No radiological evidence of osteoporosis

Response to Treatment —This woman had probably suffered from a hypochromic anæmia most of her life

sulphate gr 10 t d s was given by mouth for 8 weeks al without effect, and molybdenised iron, folic acid, eolysed liver, were also ineffective Ferrivenin to a 1 68 g intravenously restored her Hb to normal, a macrocytosis which has since remained unaltered months without further treatment Her tongue o be atrophic or sore She said that she now knew first time the feeling of being well

3 —A woman aged 57 Normal childhood, but severe with weakness and dyspnœa at age of 13 Adult racterised by many years of abdominal complaints, arly pain, flatulence, and occasional diarrhœa In ad appendicectomy and removal of gall bladder ing multiple stones Some improvement of dyspepsia d, but further symptoms occurred and in 1933 gastro tomy was done for pyloric stenosis from duodenal ion. Since then has never felt fit, owing to weakness casional vomiting Severe hypochromic anæmia was d in 1944, responded slowly to iron by mouth This ent has been continued, but since 1947 she has gradually e more anæmic and has developed sore tongue, gia, indigestion, and pins and needles She has been ant of fats Her bowels have opened 2–4 times daily attacks of diarrhœa, when motions were pale and ive

admission she was pale and thin, height 5 ft 4 in, t 7 st 10 lb Atrophic tongue and brittle nails, but no signs of organic disease

estigations —Fat absorption 83–86% Histamine fast hydria Blood proteins 6 g per 100 ml (albumin/globulin ratio normal) Liver function tests normal Van den Bergh reaction negative

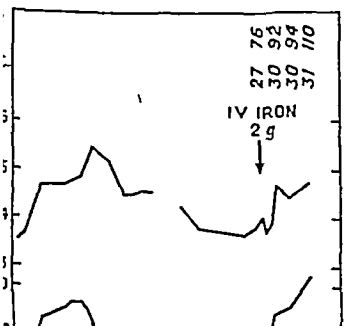

Fig 3—Response in case 3

Response to Treatment —This was a case of steatorrhœa which probably preceded the gastroenterostomy She had been treated for idiopathic hypochromic anæmia for 5 years and had gradually developed complete resistance to oral therapy Careful observation over 18 months before admission showed no response to ferrous sulphate Blood t rapidly returned to normal with ferrivenin (2 g of Macrocytosis, with mean corpuscular volume (M C V) c.μ, developed after 2 months

se 4 —A woman aged 31 Suffered from vomiting and ea in infancy and nearly died when 1 year old Child then healthy apart from anæmia at 14, treated with nd liver but malaise and fatigue continued Anæmia noticed in 1944 when Hb was 45% and she received r iron In 1946 was admitted to hospital with swinging temperature ascribed to "unresolved pneu Severe anæmia found, and hæmatologist suggested ility of steatorrhœa Bowels usually regular, but liable acks of diarrhœa and small painful ulcers on tongue in 1946 had right pleural effusion with area of tuber infiltration in lung Long illness ensued, complicated ict coli pyelitis and phlebitis in both legs In next s health was handicapped by persistent anæmia No nal blood loss

admission she was thin, pale, and asthenic, height 6 in., weight 8 st 4 lb Tongue normal No koil ia Chronic painful ulcer, 1 inch in diameter on inner f left ankle said to have been present for 2½ years *estigations* —Fat absorption 65–77% Fractional test revealed hydrochloric acid only after histamine Flat e tolerance curve Serum proteins 6 8 g per 100 ml (albumin/globulin ratio normal) Serum calcium and serum phosphorus normal Van den Bergh reaction negative Liver function tests normal X ray film of chest showed small area of fibrosis only

Response to Treatment —This was a case of idiopathic steatorrhœa with a dimorphic blood picture, giving a low colour index in spite of the high mean cell volume The anæmia did not respond to iron by mouth over many years, but 2 8 g of iron intravenously produced a reticulocytosis of 22% and a temporary increase of macrocytosis and raised the Hb to normal levels

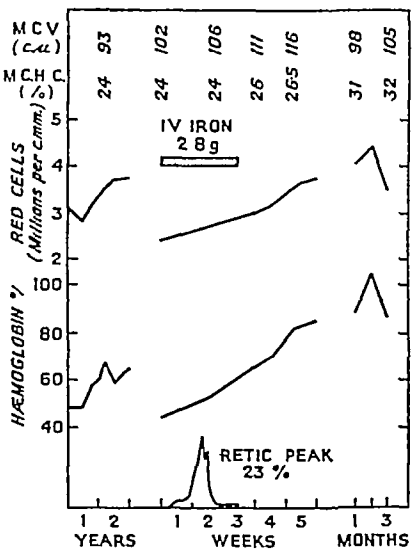

Fig 4—Response in case 4

Case 5 —A woman aged 38 Had infantile diarrhœa lasting 24 weeks from age of 3 months Later had recurrent episodes of vomiting and diarrhœa for 24 hours in otherwise normal childhood No history of steatorrhœa in family Father, mother, and one sister died of tuberculosis In adult life she was well until first pregnancy, at age of 30 when she developed stomal ulcers and diarrhœa, which continued intermittently for next 3 years before anæmia was discovered and steatorrhœa diagnosed In last 5 years had further attacks of diarrhœa, lasting up to 6 weeks, with large offensive porridge like motions, attacks often follow colds and chilling and are often promenstrual accompanied by flatulence, anorexia and abdominal discomfort She has lost weight and had recurrent soreness of tongue

On admission she was pale and thin, height 5 ft 3 in, weight 7 st, Tongue normal No koilonychia No signs of organic disease

Investigations —Fat balance 79% Low gastric acidity Flat glucose tolerance curve Van den Bergh reaction negative Serum sodium, calcium, and phosphorus normal Blood proteins 7 g per 100 ml (albumin/globulin ratio normal) X ray films of chest normal

Response to Treatment —This was a typical case of idiopathic steatorrhœa which had not responded to iron by mouth given for 18 months Outpatient treatment with ferrivenin (2 28 g of iron) raised her Hb to 96% and produced a macrocytosis (M C V 105 5 c μ)

Case 6 —A nursing sister aged 50 With a refractory hypochromic anæmia under careful observation for 14 years No response to any preparation of iron by mouth in spite of additional ascorbic acid Ferrous sulphate 2 g daily taken continuously for many years 'Plexan also taken. Symptoms were malaise excessive dyspnœa on exertion nocturnal cramps in legs, and occasional sore tongue Had cholecystectomy

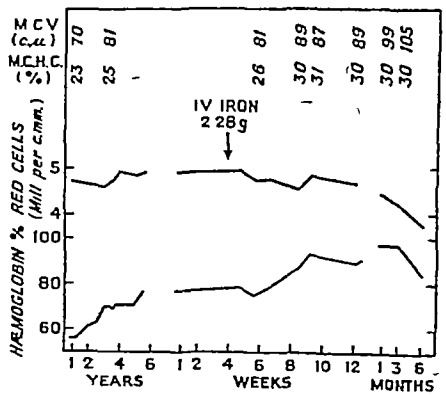

Fig 5—Response in case 5

for gall stones in 1939, since then had recurrent attacks of upper epigastric pain with continuous vomiting lasting 2–3 days, suggestive of chronic pancreatitis Bowels usually opened 2–3 times daily, but had frequent attacks of diarrhœa with bulky pale motions

On admission she was pale but well nourished, height 5 ft 4½ in, weight 8 st 8 lb Koilonychia present Tongue normal

Investigations—Fat absorption 85% Normal gastric acidity and glucose tolerance Blood proteins 6 g per 100 ml (albumin/globulin ratio normal) Van den Bergh reaction negative Blood calcium normal X ray films of chest and abdomen normal

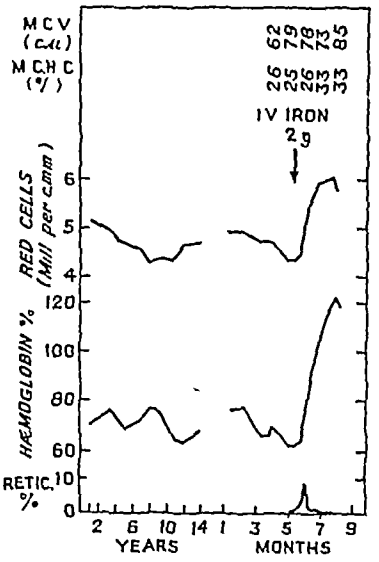

Fig 6—Response in case 6

Response to Treatment—This patient's hypochromic anæmia had never responded to iron by mouth, and in view of our previous experience, a fat balance test was performed and she was found to have steatorrhœa, possibly due to chronic pancreatitis Daily injections of intravenous iron to a total of 2 g relieved her malaise and nocturnal cramps and improved her energy, but her dyspnœa on exertion remains Her blood counts have returned to normal, but, up to 2 months after the course of treatment, there has been no macrocytosis

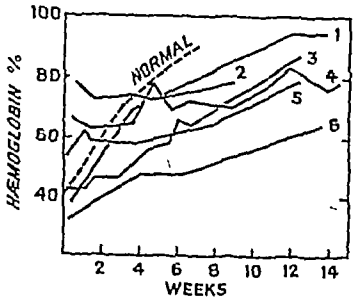

Fig 7—Rate of regeneration of hæmoglobin in response to iron by mouth: N, normal (Heath 1933), 1 6, in steatorrhœa (2 is almost completely refractory, and 3-6 are partially refractory)

SUMMARY OF RESULTS

The six cases all responded satisfactorily, and the results are shown graphically in figs 1–6 The actual rates of regeneration were similar to those reported elsewhere (Goetsch et al 1946) The maximum rate of hæmoglobin regeneration was 0 25 g daily, calculated at weekly intervals, and the minimum, seen in a patient who received injections twice weekly, was 0 04 g In the three cases where the reticulocyte response could be followed the "peaks" were higher than with iron by mouth and in one the peak was 23%, compared with the expected value of 8% (Minot and Heath 1932)

These patients have been under observation for 6–18 months, and so far further iron has not been necessary A striking feature of the results has been the rapid improvement in the mean corpuscular hæmoglobin concentration and the pronounced increase in the mean cell volume, associated with obvious macrocytosis in the peripheral blood films, in five out of the six patients

DISCUSSION

If radioactive iron is injected intravenously (Finch et al 1949), 75% will be incorporated into the erythrocytes within ten days, the remaining 25% being mainly stored There seems to be a reciprocal relationship between the amount of intravenous iron utilised and the quantity stored, and it is the uncertainty of the state of the existing stores at any given time that prevents any accurate estimation of the amount needed by the body It has been assumed that 25 mg of iron will produce a rise of hæmoglobin of 1%, this assumption does not hold in pregnancy (Gow Scott 1949) In this series the total amount of iron was up to twice that needed to bring the blood to normal

There has been little work reported on the refractory hypochromic anæmia Powell (1944) the beneficial effect of ascorbic acid in two cases, she thought was mainly due to its action as a agent in prolonging the more absorbable ferrous but in a third it evoked no response to iron our patients had received 300 mg of ascorbic without effect

The introduction of a potent therapeutic we made it possible to study such cases in more It may be a coincidence that all the patients series present the combination of refractory hypo anæmia and a fat absorption defect, because we a large number of patients with steatorrhœa and care, but two were found elsewhere and the fat b test was merely a routine investigation There however, certain features which justify further atte to the possible relationship between the two condi As Thaysen (1932) was the first to show, the hæm logical pattern of the steatorrhœa syndrome variations between blood pictures that are predomin either macrocytic or hypochromic In our experie both blood pictures are usually associated with an incre in the mean cell diameter, a slightly reduced m corpuscular hæmoglobin concentration, and, very r with microcytosis Nevertheless many cases remain the macrocytic stage, whereas a small group may years persist as a severe hypochromic anæmia and considered idiopathic In men the rarity of this condi usually leads to full investigation, but in women diagnosis is often made in spite of the presence of hy chloric acid in the test meal and the absence microcytosis

In our series of over two hundred cases of steato of varied ætiology there were thirteen patients in w serial blood examinations over a considerable showed a persistent hypochromic anæmia One respon normally to ferrous sulphate by mouth (Heath 1 six had a slow and irregular rise in the blood-count fig 7), and the remaining six cases are those repo in detail here Other workers (Thaysen 1932, Ben et al 1932) have also commented on the poor resp of the hypochromic cases to oral iron therapy, and not surprising that cases completely refractory oral treatment are found in steatorrhœa The response to intravenous iron indicates that the syn of hæmoglobin is normal, and the inference of absorp defect is obvious The frequent development or a tuation of macrocytosis after parenteral iron ther of particular interest, for it suggests that the picture in steatorrhœa is essentially macrocytic, the characteristic fluctuations due to iron defic Nevertheless we feel that further studies are nec before an unequivocal opinion can be expressed on points

SUMMARY

Criteria are given for the diagnosis of refr hypochromic anæmia

Six cases, with an associated fat absorption d responded to intravenous iron, with the product macrocytosis in five cases

It is suggested that a high proportion of patients refractory iron deficient anæmia will be found to steatorrhœa if fat balance tests are done

This work is part of a general investigation of the s rhœa syndrome which is being carried out in the depart of gastro enterology (Prof I L Hardy), medicine

arnott), and pharmacology (Prof A C Frazer) in the ity of Birmingham We are indebted to Mr Garfield , M.SC , for the biochemical investigations of us (C F H) was working under the tenure of a zie Mackinnon research fellowship

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IANCING EFFECT OF CORTISONE ON TUBERCULOSIS IN THE MOUSE

P D'ARCY HART R J W REES
M.D Camb , F.R C P M B , B Sc Lond
rom the National Institute for Medical Research, London

ALTHOUGH circumstantial evidence suggests that nutrition, certain endocrine disturbances, fatigue, and er factors can increase the susceptibility of human ngs to tuberculosis, experiments on laboratory mals have yielded few clear cut and reproducible tances of such action

No nutrient or class of nutrient, or even a general reduc a in calorific intake, has been incriminated conclusively e infected intravenously or intracerebrally with tubercle cilli lived a shorter time on certain natural diets than on ers, but these effects have not yet been successfully alysed (Dubos and Pierce 1948, Sengupta and Howie 1949) changes in the form, incidence, or duration of tuberculous ions in rats given protein-deficient diets, and infected ravenously, were observed by Metcoff et al (1949), and e experience of Glover and Hart (1946) with protein deficient ts infected by an inhalation method was similar More omising results have been obtained recently with dietary ids Diets rich in egg yolk were reported by Cirio and osso (1947) to aggravate the course of experimental tuber ulosis in guineapigs , and Hedgecock (1948) found that the ortality was greater, and the lung disease more extensive, mice infected intravenously and given diets containing nseed or olive oil or oleic acid, than in control mice on a lipid ree diet Apart from suggestions that vitamin C deficiency nhances experimental tuberculosis in guineapigs (e g , Greene et al 1936) the results of studies on the influence of itamin deficiencies upon this infection in laboratory animals ave been indefinite or contradictory (see Rich 1944)

Much of the work on the influence of hormones on suscep ibility to experimental tuberculosis has also given indefinite r contradictory results, as, for example, with the œstrogens nd the gonadotropins Lurie Abramson, and Allison (1949) elieve that the hormone effects may be small, and that they ere able to detect enhancement of the disease in rabbits by horionic gonadotropin because they used highly inbred nimals of genetically uniform stock and closely similar ereditary resistance to tuberculosis and infected them ntracutaneously The rôle of the thyroid in resistance is also ncertain Reports suggest that susceptibility in guineapigs increased by thyroidectomy, though the effect appears to e small (e g , Izzo and Cicardo 1947) In spite of strong vidence of a predisposition of human diabetics to tuberculosis, e have been unable to demonstrate any change in suscepti ibility in mice given alloxan diabetes, followed by an acute tuberculous infection.

Apart from the obvious possibility that as yet undis covered factors are operative, a number of reasons could be suggested to account for the meagre results in this experimental field , for instance, it may be difficult to solve these problems of human resistance in laboratory animals, and some of the techniques may be unsuitable for detecting increased susceptibility to tuberculous infection In the main, the techniques have been those usually employed for chemotherapeutic assays, based on acute or subacute progressive infection following intravenous inoculation in the mouse or rat or subcutaneous inoculation in the guineapig Such methods may be more suitable for detecting retardation of tuberculosis due to an increase in host resistance than for detecting aggravation of the disease due to enhanced susceptibility We thought that if a stable chronic infection in the lungs could be produced experimentally, any breakdown in resistance would be manifested by a flare up of the established lesions, which might or might not be fatal, such a process might throw light on exacerbations in human chronic pulmonary tuberculosis The mouse was a suitable species to use, because of its high natural resistance to tuberculosis

A B

Fig 1—(A) Gross specimen of lungs from a mouse with a stable chronic tuberculous infection (×1½) (B) Lungs from a similar mouse after a course of cortisone (× 1½)

We have recently produced in mice a chronic pulmonary tuberculous infection sufficiently stable to serve as a test infection , and in view of its wide range of activity on host defences, we examined ' Cortisone ' for its ability to break down the resistance in mice so infected We have also, for comparison, tested the effect of the drug on acute tuberculous infection in mice

A B

Fig 2—(A) Section through a lobe of the lung from a mouse with a stable chronic tuberculous infection, showing many small discrete lesions Hæmatoxylin and eosin (×6½) (B) The same type of infection after cortisone treatment showing massive partially coalescent necrotic lesions replacing most of the lung field Hæmatoxylin and eosin (×6½)

for gall stones in 1939, since then had recurrent attacks of upper epigastric pain with continuous vomiting lasting 2–3 days, suggestive of chronic pancreatitis Bowels usually opened 2–3 times daily, but had frequent attacks of diarrhœa with bulky pale motions

On admission she was pale but well nourished, height 5 ft $4^1/_2$ in, weight 8 st 8 lb Koilonychia present Tongue normal

Investigations—Fat absorption 85% Normal gastric acidity and glucose tolerance Blood proteins 6 g per 100 ml (albumin/globulin ratio normal) Van den Bergh reaction negative Blood calcium normal X ray films of chest and abdomen normal

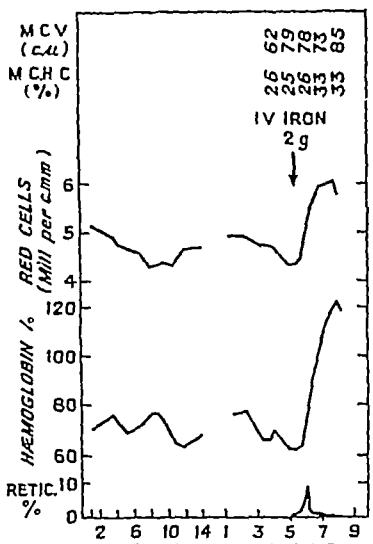

Fig 6—Response in case 6

Response to Treatment—This patient's hypochromic anæmia had never responded to iron by mouth, and in view of our previous experience, a fat balance test was performed and she was found to have steatorrhœa, possibly due to chronic pancreatitis Daily injections of intravenous iron to a total of 2 g relieved her malaise and nocturnal cramps and improved her energy, but her dyspnœa on exertion remains Her blood counts have returned to normal, but, up to 2 months after the course of treatment, there has been no macrocytosis

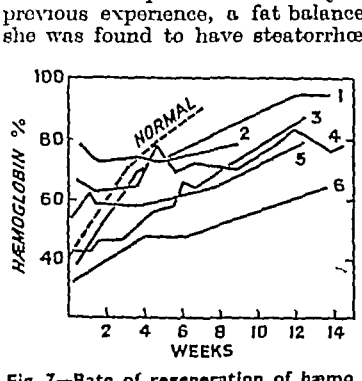

Fig 7—Rate of regeneration of hæmoglobin in response to iron by mouth: N, normal (Heath 1933) 1-6, in steatorrhœa (2 is almost completely refractory, and 3-6 are partially refractory)

SUMMARY OF RESULTS

The six cases all responded satisfactorily, and the results are shown graphically in figs 1–6 The actual rates of regeneration were similar to those reported elsewhere (Goetsch et al 1946) The maximum rate of hæmoglobin regeneration was 0 25 g daily, calculated at weekly intervals, and the minimum, seen in a patient who received injections twice weekly, was 0 04 g In the three cases where the reticulocyte response could be followed the "peaks" were higher than with iron by mouth and in one the peak was 23%, compared with the expected value of 8% (Minot and Heath 1932)

These patients have been under observation for 6–18 months, and so far further iron has not been necessary A striking feature of the results has been the rapid improvement in the mean corpuscular hæmoglobin concentration and the pronounced increase in the mean cell volume, associated with obvious macrocytosis in the peripheral blood films, in five out of the six patients

DISCUSSION

If radioactive iron is injected intravenously (Finch et al 1949), 75% will be incorporated into the erythrocytes within ten days, the remaining 25% being mainly stored There seems to be a reciprocal relationship between the amount of intravenous iron utilised and the quantity stored, and it is the uncertainty of the state of the existing stores at any given time that prevents any accurate estimation of the amount needed by the body. It has been assumed that 25 mg of iron will produce a rise of hæmoglobin of 1% this assumption does not hold in pregnancy (Gaw Scott 1949) In this series the total amount of iron was up to twice that needed to bring the blood to normal

There has been little work reported on the refractory hypochromic anæmia Powell (1944) the beneficial effect of ascorbic acid in two cases she thought was mainly due to its action as a agent in prolonging the more absorbable ferrous but in a third it evoked no response to iron. our patients had received 300 mg of ascorbic without effect

The introduction of a potent therapeutic w made it possible to study such cases in more It may be a coincidence that all the patients series present the combination of refractory hypo anæmia and a fat absorption defect, because we a large number of patients with steatorrhœa under care, but two were found elsewhere and the fat l test was merely a routine investigation There however, certain features which justify further atte to the possible relationship between the two condi As Thaysen (1932) was the first to show, the hæm logical pattern of the steatorrhœa syndrome sh variations between blood pictures that are predomina either macrocytic or hypochromic In our experien both blood pictures are usually associated with an incre in the mean cell diameter, a slightly reduced mean corpuscular hæmoglobin concentration, and, very rarely, with microcytosis Nevertheless many cases remain in the macrocytic stage, whereas a small group may for years persist as a severe hypochromic anæmia and be considered idiopathic In men the rarity of this condition usually leads to full investigation, but in women diagnosis is often made in spite of the presence of hydrochloric acid in the test meal and the absence microcytosis

In our series of over two hundred cases of steato of varied ætiology there were thirteen patients in whom serial blood examinations over a considerable showed a persistent hypochromic anæmia One responded normally to ferrous sulphate by mouth (Heath 1933) six had a slow and irregular rise in the blood-count (fig 7), and the remaining six cases are those reported in detail here Other workers (Thaysen 1932, Brown et al 1932) have also commented on the poor response of the hypochromic cases to oral iron therapy, and it not surprising that cases completely refractory oral treatment are found in steatorrhœa The response to intravenous iron indicates that the synthesis of hæmoglobin is normal, and the inference of absorption defect is obvious The frequent development or persistuation of macrocytosis after parenteral iron therapy of particular interest, for it suggests that the blood picture in steatorrhœa is essentially macrocytic, the characteristic fluctuations due to iron deficiency Nevertheless we feel that further studies are necessary before an unequivocal opinion can be expressed on points

SUMMARY

Criteria are given for the diagnosis of refractory hypochromic anæmia

Six cases, with an associated fat absorption defect responded to intravenous iron, with the production macrocytosis in five cases

It is suggested that a high proportion of patients refractory iron deficient anæmia will be found to have steatorrhœa if fat balance tests are done

This work is part of a general investigation of the steatorrhœa syndrome which is being carried out in the department of gastro-enterology (Prof T L Hardy), medicine (

CT OF CORTISONE ON CHRONIC TUBERCULOSIS

eriment 1 —22 apparently healthy mice (average now 25 g), which had been infected 9 weeks isly with 0 0006 mg of H37RV, were randomised ro groups of 11 One group was given cortisone daily until death or the 17th day of treatment, ver came first, a maximum of 15 injections eceived , the other group served as a control. The ment was terminated 22 days after the first day atment, and all surviving animals of both groups The results are shown in table I The control mice ned apparently fit, gained weight, and none died, as the treated mice showed signs of sickness and eight from the 11th day onwards 2 of them died e 13th day and 6 from the 19th to the 22nd days, a of 8 out of 11 being dead at the termination of the ment

addition to the differences in mortality, the two ps were distinguished by the pathological changes 11 controls had pink, air containing lungs with small, ning grey lesions as previously described, whereas t of 8 of the dead, and 1 out of 3 of the killed, isone treated mice had voluminous congested lungs aining many very large, raised yellow grey lesions 1B) , the remaining 3 mice had lungs similar to those the controls No macroscopic extrapulmonary foci e seen in either group, but whereas the control mals all had splenomegaly (a characteristic feature of onic murine tuberculosis), the spleens of the treated e were small

The histology of the lungs in the controls has already n described (figs 2A and 3A) The cortisone group were striking contrast Instead of cellular foci, the large sed lesions consisted of massive, partially coalescent as almost entirely made up of necrotic tissue, and placing most of the lung substance (figs 2B and 3B) e cells at the periphery of these areas were mainly crophages, and in no way differed from the cellular ction seen in the lesions in the control lungs The small ount of unaffected lung tissue was markedly con ted In contrast to the few tubercle bacilli in the trol lungs (fig 4A), and their limitation to the cellular , there were tremendous numbers of organisms in the crotic areas, and some in the surrounding lung tissue, f the cortisone treated group (fig 4B) Minute prolifera ve foci, containing scanty tubercle bacilli, were seen in ome of the other organs, particularly the liver and dneys, but the distribution and appearances were dentical in the two groups of animals , however, extra-ocal tubercle bacilli were present in most of the tissues xamined from the treated mice but not from those in he controls This difference is presumably due to a erminal overwhelming bacteriæmia in the former

Experiment 2 —36 apparently healthy mice (average eight now 24 g), which had been infected 6 weeks eriously with 0 0006 mg of H37RV, were randomised nto three groups of 12 In addition, 10 uninfected mice, aken from stock at the time the others were infected average weight now 25 g), were randomised into two roups of 5 One infected and one uninfected group were given cortisone 0 5 mg daily, and a second infected and he other uninfected group 0 25 mg daily, until they ied or the experiment ended , the third infected group served as an untreated control The experiment was terminated, and all survivors killed, 22 days after the first day of treatment in the groups receiving 0 5 mg and in the untreated tuberculous controls), and after 29 days in those receiving 0 25 mg , the maximum numbers of injections received being 19 and 25 respectively

The results are shown in table II The tuberculous control mice and the uninfected controls on cortisone remained apparently healthy and none died, whereas both treated tuberculous groups showed signs of sickness after a latent period, and some of the animals died , both sickness and deaths occurred some days later in those given the smaller than in those given the larger dose Thus at the higher dose, 9 of the 12 mice died from the 10th day to the termination of the experiment and 5 of these 9, as well as 2 of the 3 killed, had the same gross pulmonary tuberculous lesions as in the first experiment At the lower dose, after 1 unexplained death on the 9th day, 8 of the 12 mice died from the 19th to the termination, and 6 of these 8, and none of the 3 killed, had similar gross lesions The remaining mice in the cortisone treated groups had chronic changes in the lungs similar to those in the tuberculous controls There was, however, a complication in that 4 of those on the higher dose and 2 on the lower (i e , 6 of the total 24 treated animals) had died with necrotic foci in the liver, apparently due to various non acid fast bacteria Nevertheless, the contrast, both microscopic and macroscopic, between the lungs containing the gross tuberculous lesions and the chronic proliferative changes seen in the untreated controls was as striking as in the first experiment

EFFECT OF CORTISONE ON ACUTE TUBERCULOSIS

Experiment 3 —35 mice, weighing 18–20 g , were randomised into three groups Two of the groups, containing 10 and 20 animals respectively, were infected with 0 06 mg of H37RV The first of these was treated with cortisone 0 5 mg daily from the day of infection, and the second served as an untreated control, 10 being allowed to die naturally and 10 being killed at selected intervals (see below) The third group, containing 5 uninfected mice, also received cortisone 0 5 mg daily, and served as a toxicity control Cortisone treatment was continued until death or the 10th day of treatment, whichever occurred first, a maximum of 9 injections being received

The results are shown in table III The untreated infected control mice were at first apparently fit and gained weight, but their condition gradually deteriorated and 9 of the 10 died between the 14th and 24th days after infection (the remaining animal having died on the 5th day from non specific causes) On the other hand, the treated infected mice began to lose weight in the first week, though they appeared otherwise healthy , on the 9th day after infection (10th day of treatment), however, their condition suddenly deteriorated (necessitating termination of treatment), and 4 died on the next day and all 10 were dead 15 days after infection The toxicity control mice, although gaining weight more slowly than normal untreated mice, remained apparently fit and none died Thus there was a striking difference in mortality between the treated and untreated infected mice

At necropsy, the 9 untreated mice dying with tuberculosis showed obvious lung involvement, and 5 of them pericardial lesions The cortisone treated infected group died with far less obvious, although more disseminated, disease (9 of the 10 with pericardial, 5 with renal, and 5 with splenic involvement) It is unsatisfactory to compare the small lesions in the treated animals, which died early, with the more obvious changes in the untreated animals, which died later Necropsy of the additional 10 untreated infected controls (half on the 11th and half on the 15th day after infection), during the period when most of the treated group were dying, gave a more useful comparison, because the period of infection was similar in the two groups , these killed untreated mice had only minimal lesions, less than in the treated group, and mainly confined to the lungs instead of being disseminated

The histological comparisons were more clear-cut than the macroscopic In the cortisone treated group, all the foci were undergoing necrosis, irrespective of the size, the site, or the survival period, and all were teeming with

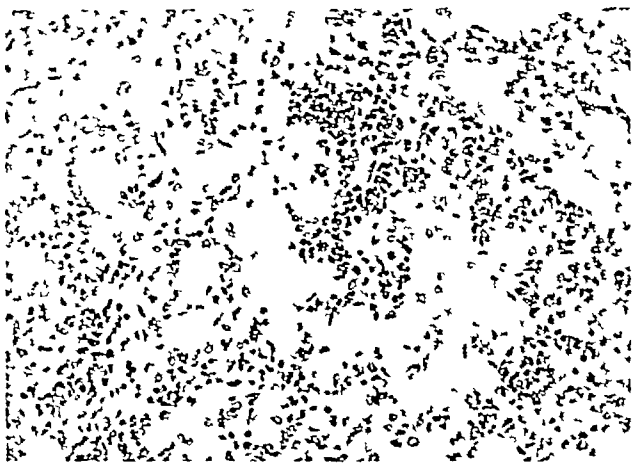

Fig 3A—Section of a typical proliferative pulmonary lesion with minimal necrosis in a mouse with a stable chronic tuberculous infection Hæmatoxylin and eosin (×250)

Fig 3B—The same type of infection after cortisone the grossly necrotic centre with nuclear debris of a Hæmatoxylin and eosin (×250)

MATERIALS AND METHODS

Mice—Females of the albino Parkes strain (an inbred strain maintained at the National Institute for Medical Research) 18–20 g initial weight, were used They were housed 5 or 6 in a box fed once daily on a stock mash diet, and weighed fortnightly

Bacterial suspensions—*Mycobacterium tuberculosis*, strain H37RV was grown for 7 days in 'Tween 80 albumin medium The culture was centrifuged, and the bacterial deposit resuspended in Tween albumin saline solution, about 0 3 mg dry weight per ml, measured routinely by opacity in a photoelectric absorptiometer (all doses are expressed here as dry weight), such suspensions contained about 10^8–10^9 viable organisms per ml The bacillary suspension, diluted in Tween albumin saline to contain the required dose in 0 5 ml, was injected into the tail vein

Cortisone treatment—Cortisone, as a microcrystal suspension of the acetate (Merck), was diluted in saline, and the required dose was injected, in a volume of 0 5 ml subcutaneously into the nape of the neck once daily (excluding Sundays) A preliminary toxicity test showed that mice weighing 18–20 g would tolerate 0 5 mg cortisone daily for 14 days This dosage corresponds on a weight basis with that used in rats by Selye (1949)

PRODUCTION IN MICE OF A STABLE CHRONIC PULMONARY TUBERCULOSIS

Parkes mice infected intravenously with 0 3–0 03 mg of strain H37RV, consistently develop progressive and fatal tuberculosis in 1–5 weeks, the period depending on the actual dose Smaller doses produce a more chronic disease With 0 0006 mg the mice, in general re fit and gain weight normally and up to 3 weeks none die Less than 10% of the animals go sick and between the 3rd and 6th weeks In these preparat more susceptible mice, about half the lungs contain large necrotic lesions and the remainder smaller, more discrete, proliferative lesions

From the 6th week onwards, and at least until the 12th week, the mortality is only about 2% Mice kill between the 6th and 12th weeks have pink, air contain lungs of normal size, speckled with grey lesions varying in number and size but always relatively small (fig and 2A) The similarity of these lesions in groups of m killed at varying times during this period indicates change, or, at the most, slight progression Microscopically the lesions are proliferative, with minimal ne (fig 3A) The cellular response is predominantly macrophage, many of the macrophages are large, with abundant indistinct vacuolated cytoplasm, characteristic chronic types of infection in the mouse The cell lesions, which are discrete and evenly distributed in otherwise normal air containing lung, are never associated with perifocal fibrosis Tubercle bacilli are seen occurring either singly or in small groups, and they confined to the cellular foci (fig 4A)

Mice with this chronic tuberculous infection, relatively non progressive over the test period (and therefore referred to as stable), were used in the main experiments (1 and 2), which were made between 6 and 12 weeks after infection

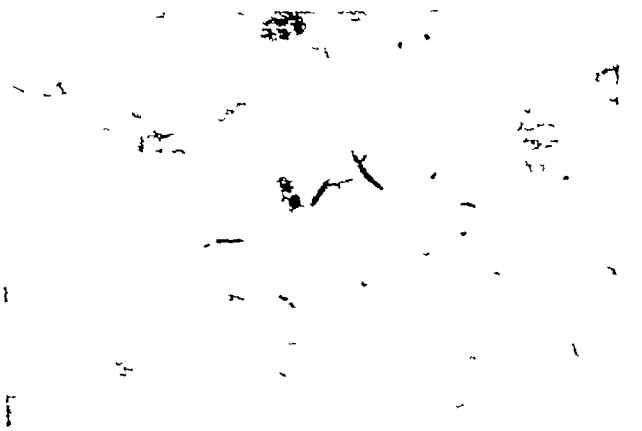

Fig 4A—As fig 3A showing the scanty tubercle bacilli Ziehl Neelsen (×1320)

Fig 4B—As fig 3B showing the tremendous number of tu bacilli Ziehl Neelsen (×1320)

groups in two of the experiments reported here, new of the varied flora found, it is possible that e causes in the mouse a breakdown in host ce to a wide range of micro organisms It may be nt Antopol (1950) reported necrotic foci in the a proportion of mice treated with large doses isone, all of which yielded *Corynebacterium iberculosis murium* on culture

nnot be assumed that the disastrous effects of ie on the tuberculous mouse are necessarily t to the disease in man Hypersensitivity is d to play a considerable part in human tubercu ıd, from the few treated cases of this disease so ported (Hench et al 1950), the depression of nin sensitivity in the guineapig seems to have its rpart in a reduction in allergic phenomena in man other hand, a reduction in resistance, such as we shown in mice, might occur at the same time as a ion in hypersensitivity in human tuberculosis, and must be watched for It must be emphasised, er, that the doses of cortisone employed in the it study have been relatively high—namely, 6–12 (on a weight basis) that commonly used clinically our two techniques, the main method, using mice established chronic infection (experiments 1 and 2), satisfactory results in the unequivocal macroscopic microscopic appearances of the lungs of the animals g in the cortisone treated groups, so great was the rence from the controls killed at the same time, in of the variation in the latter within a limited range, it is reasonable to attribute the effects to the isone Even in experiment 2, where a proportion of his was associated with non specific liver infections, results were still definite In the acute infection test eriment 3), the earliness of the deaths, with the sequent diffuse small pulmonary foci, in the cortisone-ited group made it difficult to attribute the cause of th to an enhancement of the infection, and it was e-sary to rely on histological rather than on naked eye earances Furthermore, it was necessary to kill reated mice during the experiment in order to make adequate histological assessment of the effect of the tisone The additional test in which the cortisone atment was begun at the same time as infection with very small dose of tubercle bacilli, selected to give a ronic infection and a low mortality, was seriously mplicated by non specific liver disease Yet the animals ing with tuberculosis showed such gross dissemination compared with the controls (all of which were ive at the time) that this method is worth further vestigation

SUMMARY

1 Few clear cut or reproducible instances of factors creasing the susceptibility of animals to experimental iberculosis emerge from the many investigations hough a number of reasons can be given for these failures, e suggest that the acutely infected experimental animal nerally used may be unsuitable For this reason a ore chronic stable type of infection was sought

2 Intravenous injection of 0 0006 mg dry weight of man type tubercle bacilli in mice produced such an fection, relatively non progressive over 6–12 weeks, d characterised during this period by small discrete, edominantly proliferative, pulmonary lesions containing anty tubercle bacilli.

3 Cortisone 0 25–0 5 mg, given daily subcutaneously 2–3 weeks during the stable period of this chronic lmonary infection, markedly exacerbated it, with a sulting high mortality, the voluminous lungs contained ge coalescing necrotic lesions with great numbers of bercle bacilli

4 The more acute type of tuberculous infection in the ouse, produced by intravenous injection of 0 06 mg of bacilli, was also enhanced by cortisone 0 5 mg daily, given from the 1st until the 9th day of infection

5 The chronic infection test has proved highly satisfactory as a method for demonstrating enhanced susceptibility to tuberculosis due to cortisone, the acute infection test was more difficult to interpret

6 The effect of cortisone on murine tuberculosis is unlikely to be due to depression of allergy or of collagen formation

7 Although human tuberculosis differs considerably from murine, and the present dosage of cortisone was relatively high, these findings should be kept in mind since tuberculosis in man may possibly be aggravated similarly

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TREATMENT OF FIBROSITIS WITH ADRENALINE, EPHEDRINE, AND BELLADONNA CREAMS

TREVOR H HOWELL
M.R C.P.E
PHYSICIAN, GERIATRIC UNIT, ST JOHN'S HOSPITAL, BATTERSEA
CONSULTANT PHYSICIAN, BERMONDSEY MISSION HOSPITAL, LONDON

In elderly patients, the treatment of fibrositis is not an easy matter As Buckley (1937) has said, "The disease though not mortal, may add seriously to the burden of advancing years" The claims of Moss (1949) for adrenaline cream were therefore noted with interest, and the effects of this and other preparations have been investigated at St John's Hospital, Battersea, and the Bermondsey Mission Hospital At Battersea, 70 out patients attending the rheumatic clinic and 20 inpatients of the geriatric unit were treated with injections of cream instead of their customary injections of procaine, but physiotherapy was continued as usual At Bermondsey, 20 outpatients received the cream only, without any physiotherapy Of the patients at Battersea, 36 had fibrositis complicating rheumatoid arthritis, 35 had fibrositis complicating osteo arthritis, and 19 seemed to have a pure primary fibrositis The cases at Bermondsey included 3 with rheumatoid arthritis, 11 with osteo arthritis, and 6 with fibrositis alone

ADRENALINE CREAM

It was found that the base in which the adrenaline was administered made a difference in its effects The most satisfactory preparation was that made by Messrs Howard Lloyd Ltd, of Leicester This was easy to rub in and usually acted within a few seconds, in a strength

tubercle bacilli Bacilli were particularly profuse in the pulp of the spleen, although this organ was very small, owing to gross diminution in the number of pulp cells and smaller malpighian bodies as a result of the cortisone In contrast, the untreated control mice, both those killed and those dying up to the 20th day, had proliferative lesions, with relatively few tubercle bacilli, even in the animals dying later, although the pulmonary lesions showed early necrotic changes and many bacilli, the extrapulmonary foci remained proliferative with scanty organisms In all these control animals the spleens were enlarged, owing to a generalised cellular hypertrophy, as is typical of murine tuberculosis, they contained only isolated small groups of bacilli

In another experiment the course of cortisone was started, as in experiment 3, on the day of infection, but the infecting dose was the small amount of tubercle bacilli (0 0006 mg) used to produce the benign chronic infection in experiments 1 and 2 Unfortunately, half the treated mice died with liver infections associated with various non acid fast bacteria The experiment is worth mentioning, however, since the remainder died with tuberculosis between the 17th and 29th days after infection, and all of these had marked pulmonary lesions with gross dissemination in the heart and kidneys These findings contrasted with those in the untreated mice, none of which had died during this period, and which, on the 29th day, had the usual limited pulmonary tuberculosis of chronic type and no extrapulmonary dissemination The picture in the treated animals is characteristic of an acute infection from a much larger dose of tubercle bacilli

TABLE I—EFFECT OF CORTISONE ON STABLE CHRONIC PULMONARY TUBERCULOSIS IN MICE

Week after infection	Average weight (g)		Day of death (D) or killing (K),* and condition of lungs †	
	No cortisone −	Cortisone +	No cortisone −	Cortisone +
9	24 7	24 7		
10				
11				
12	25 5	19 5		**D13 D13 D19 D19 D10 D20, D21**
13				**D22**
13			(22) K, K, K, K, K, K K, K K, K, K	(22) K, K, K

* Numeral indicates number of days after first day of cortisone treatment all surviving mice were killed on 22nd day

† Bold type indicates voluminous lungs with massive lesions, ordinary type indicates small discrete lesions

DISCUSSION

Cortisone has shown a very powerful action on a stable chronic tuberculous infection in mice (experiments 1 and 2) After a latent period, lesions originally proliferative in character became enlarged and necrotic, the bacilli increased enormously in number, and most of the mice died. We have never-observed this change in chronic tuberculous infection of this type in untreated mice It resembles the change from a proliferative to a necrotic reaction that may be seen in an acute infection following a larger dose of bacilli The flare up associated with cortisone treatment was confined to the lungs, the minute foci found in other organs differing in no way from those in the controls When cortisone was given immediately after a comparatively large dose of tubercle bacilli, calculated to produce an acute and fatal infection (experiment 3), the treated animals died even earlier than the controls Histologically, the lesions in the former were necrotic at a time when those in the latter showed only a proliferative reaction, the bacilli were more numerous and the visceral dissemination more conspicuous in the treated animals than in their controls When

TABLE II—EFFECT OF CORTISONE, AT TWO DOSE STABLE CHRONIC PULMONARY TUBERCULOSIS IN

Week after infection	Average weight (g)			Day of death (D) or killing (K) condition of lungs †		
	No cortisone	Cortisone (0 5 mg)	Cortisone (0 25 mg)	No cortisone	Cortisone (0 5 mg)	C
6	23 7	23 7	23 7			
7						
8	25 1	24 0	25 8		*D10*, D12, D12	D9
9					D15 *D16*, D19 *D19 D19*	D19
10	25 0	19 7	22 5		D22	D22, D28
11			22 3			D29
				(22) K, K, K, K, K, K, K, K, K, K, K, K	(22) K, K K	K K, K

* Numeral indicates number of days after first day of treatment, all surviving controls and cortisone (0 5 mg) were killed on 22nd day, and cortisone (0 25 mg) on 29th day

† Bold type indicates voluminous lungs with massive ordinary type indicates small discrete lesions italics death associated with necrotic liver lesions

cortisone treatment was begun immediately same small infecting dose as was used to produce benign chronic infection, the survival period was shortened, and necropsy revealed gross disse the disease, particularly in the heart and kidneys, as is found after an acute infection from a larger inocu

The raised mortality, the necrosis, and the very number of tubercle bacilli in the lesions, observed the experiments, are consistent with a marked breakdo in resistance, and are presumably due to the cortiso

In the first experiment 2 of the 11 mice died receiving the drug, but most of the deaths took place few days after the end of the course It is poss therefore, that withdrawal of the drug was resp However, in experiment 2, in which cortisone at dose levels was continued until death or term the experiment, the mortality and pathological cha were similar to those in experiment 1, so that explanation is unlikely

Although the mechanism of these enhancing effec obscure, certain factors can probably be exclud Hypersensitivity cannot be demonstrated in the mo by a tuberculin skin test, and the depression of tuberculin reaction by cortisone in the guineapig (L and Miles 1950) is therefore not necessarily relev Nor is the retarding effect of cortisone on fibrous tis formation in the tuberculous guineapig (Karlson 19 or on wound healing in the rabbit (Ragan et al. 19 pertinent to chronic pulmonary tuberculosis in the mo where no fibrous reaction is evident

We have no clear explanation for the deaths as occa with necrotic foci in the liver, seen in the cortis

TABLE III—EFFECT OF CORTISONE ON ACUTE TUBERCU IN MICE

Week after infection	Average weight (g)		Day of death (D)*	
	No cortisone	Cortisone	No cortisone	Cortisone
0	18 4	18 6		
1	20 9	17 3	D5†	D6
2	21 3		D14	D10 D10 D10 D11 D11, D13
3	19 0		D18 D18 D19 D21	D15
4			D22 D22, D23 D24	

* Numeral indicates number of days after infection

† Non specific death

nificant difference is apparent between the effects hree medications, but the table brings out the advantage of the medicated creams over the ıse

SUMMARY

patients with chronic fibrositis, usually secondary matoid arthritis or osteo arthritis, the inunction ıaline cream by deep massage relieved the pain ı ten minutes to five days, except in 7 fat women tained no benefit The usual duration of freedom ım was twelve hours

8 patients massaged with ephedrine cream, lasting from eight hours to eight days was d

4 patients massaged with belladonna cream the ısted from an hour to eight days

tage with a blank control cream gave only two or ıours' relief in most of the 20 patients

patients with chronic fibrositis can be kept more free from pain by daily massage with one of the ıted creams

nks are due to Messrs Howard Lloyd, of Leicester, for ɔly of adrenaline cream , and to Miss Will, pharmacist, ım s Hospital, Battersea, for her assistance in preparation ı creams.

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INTERPRETATION OF HISTAMINE AND NSULIN TESTS IN PATIENTS WITH PEPTIC ULCERATION

J N HUNT
M.B , Ph.D Lond.
DR LECTURER IN PHYSIOLOGY, GUY S HOSPITAL MEDICAL SCHOOL, LONDON

ATIENTS with peptic ulceration have abnormalities astric secretion in response to histamine and insulin se responses have been well described by Ihre (1938) he gastric secretory mechanism may be considered having three parts (1) receptors of stimuli which mately activate the gastric mucosa , (2) the connec as, either humoral or nervous, between the receptors l peripheral effectors , and (3) the peripheral effectors e, the gastric secretory cells When there is some ormality of secretion, the fault may lie in any one, several, of these three parts

The subcutaneous injection of 0 1 mg of histamine d phosphate per 10 kg of body-weight usually pro ces a copious flow of gastric juice in man The tamine seems to act directly on the gastric mucosa te it is effective in animals after complete extrinsic ervation of the stomach Here then is a method of ing one of the three parts of the secretory system in ation If the response of the gastric mucosa to mal physiological stimuli is proportional to its response histamine, two persons who respond equally to hista ne may be considered to have equal peripheral secretory ctivity, or, more generally, the peripheral secretory ctivity to normal stimuli is proportional to the ponse to histamine

BLE I—COMPOSITION OF SUGGESTED COMPONENTS OF GASTRIC JUICE OF MAN

Concentrations of ions in m eq per litre (clinical units)

Acid component		*Alkaline component*	
170		Cl^-	125
	160	HCO_3^-	45
	10	Alkali metals	170
170	170	170	170

TABLE II—MEAN VOLUMES OF ACID COMPONENT SECRETED IN RESPONSE TO HISTAMINE AND INSULIN

—	Normal people	Patients with	
		Gastric ulcer	Duodenal ulcer
Number of persons	18	17	13
Histamine (*H*) (ml)	91 6	82 4	119 6
Standard error	± 7 1	± 13 1	± 13 1
Insulin (*I*) (ml)	118 7	102 7	145 8
Standard error	± 9 5	± 14 7	± 17 0
I/H	1 30	1 23	1 23
Standard error of *I/H*	± 0 14	± 0 26	± 0 19

The intravenous injection of 20 units of insulin usually produces a flow of gastric juice slightly greater than that stimulated by 0 1 mg of histamine acid phosphate per 10 kg of body weight The secretion is the result of hypoglycæmia since it is abolished when the blood-sugar level is prevented from falling by the injection of glucose The site of the receptors for this response to hypoglycæmia is not known, but the response is abolished by vagotomy Presumably, therefore, hypoglycæmia stimulates gastric secretion proximal to the effector mechanism Thus, if two persons differ in their responses to equal hypoglycæmic stimuli, the cause of the difference may lie in one, or any combination, of the three parts of the gastric secretory mechanism However, a method of assessing differences in the peripheral secretory organ with histamine has already been considered Thus, if two persons differ in their secretory responses to hypo glycæmia but not in their responses to histamine, the difference may be ascribed to the receptors and connector pathways More quantitatively, if the secretory response (*I*) to a standard hypoglycæmia is divided by the secretory response to a standard dose of histamine (*H*), *I/H* will be proportional to the total stimulus bearing on the gastric effectors—i e , the reactivity to hypoglycæmia of the receptors and connectors

By combining the results of histamine and insulin tests in this way it is possible to assess tentatively the separate reactivities of the peripheral secretory organ and of the receptor connector mechanism

So far the gastric mucosa has been considered as a simple organ, which it is not, since it secretes acid, pepsin,

TABLE III—MEAN VOLUMES OF ALKALINE COMPONENT SECRETED IN RESPONSE TO HISTAMINE AND INSULIN

—	Normal people	Patients with	
		Gastric ulcer	Duodenal ulcer
Number of persons	18	17	13
Histamine (*H*) (ml)	20 1	32 0	45 7
Standard error	± 1 6	± 2 6	± 5 1
Insulin (*I*) (ml)	22 1	45 9	50 2
Standard error	± 1 9	± 3 0	± 6 2
I/H	1 10	1 44	1 10
Standard error	± 0 13	± 0 15	± 0 18

and mucus among other things There is ample evidence that the various parts of the secretory mechanism are separately controlled, since the composition of the gastric juice varies with the stimulus to secretion. Therefore separate secretory mechanisms for the individual components must be considered in terms of their receptor-connector units and their peripheral effectors

Hitherto the secretory response of the stomach has been measured in terms of the amounts of acid and pepsin produced Recently, however, the pioneer work of Hollander (1938) in dogs has been extended to man, and it has proved possible to estimate the concentrations of ions in two hypothetical components of human gastric juice which together account for the vast majority of the inorganic constituents of the gastric juice (Fisher and

of 1 in 5000 The composition of this base was not divulged

Shortly after beginning to rub the cream into the "trigger point," or point of maximal tenderness, one could feel the skin soften This allowed irregularities in the muscle to be palpated. Sometimes—e g, in the trapezius muscle—small rounded nodules could be felt, sometimes—e g, on the outer aspect of the thigh or the inner side of the upper arm—corrugations were noted As deep massage proceeded, the nodules or corrugations became softer and smaller until in most cases they disappeared When the muscle had become soft and smooth, the patient found that the pain had gone Several patients had three or four nodules in different layers of muscle, with the result that effective treatment of one nodule merely uncovered another

The deeper the site of pain, and the fatter the patient, the harder it was to succeed with this form of therapy The 7 Battersea patients whose pain was not relieved by massage with adrenaline cream were all very fat women with tenderness deep in the thigh or groins The other 83 reported benefit and disappearance or diminution of pain lasting from ten minutes to five days, the average duration of relief being twelve hours Of the outpatients at Battersea, 12 were discharged as cured within two months of starting treatment The remainder of the patients at this hospital could be kept relatively free from pain with a combination of adrenaline cream every night and physiotherapy twice a week Of the 20 Bermondsey patients, 17 reported temporary relief lasting from four to sixteen hours each day, this enabled most of them to have a comfortable night's sleep if they applied the cream on going to bed

EPHEDRINE CREAM

The greatest defect of adrenaline cream was that its effect lasted so short a time, this led some patients to ask for injections of procaine instead of the ointment Ephedrine in a strength of 1 in 100 was therefore tried In the first place, experiments had to be made to find a suitable base for this cream Pure vanishing cream—e g, stearic acid paste *B P C*—did not allow of deep massage, because it disappeared too quickly Cold creams required too much friction to ensure absorption, though adrenaline in a vanishing cream base was used at Bermondsey for a time The formula eventually chosen was

Emulsifying wax	20 parts
Wool fat	10 ,,
Chlorocresol	0 05 ,,
Water	100 ,,

A 1% ephedrine cream in this base was tried in 63 patients at Battersea and 15 at Bermondsey Except in 2 cases, the relief obtained lasted longer than with the adrenaline cream The shortest period of relief was eight hours and the longest eight days, and freedom from pain for twenty four to forty eight hours was not unusual When the ephedrine cream was massaged in by the physician, the patient began to notice relief of pain within 40 seconds and relief was complete by 90 seconds if the site of pain lay in superficial muscles, such as the long flexors of the fingers or the quadriceps femoris This was a little slower than the action of adrenaline cream in such places

BELLADONNA CREAM

On the hypothesis that adrenaline and ephedrine might relieve pain by acting through the autonomic nervous system, the effects of belladonna were tested Our cream base with 25% of the liquid extract of belladonna *B P* was applied in 16 cases at Battersea and 8 at Bermondsey This acted more slowly than ephedrine, taking 1 minute 10 seconds to relieve pain at the shortest The duration of relief was much the same as ephedrine, varying from an hour to eight days, half the cases obtaining two or three days' relief f containing atropine 1 in 100 and hyoscine 1 in 1 tested in 6 patients. These gave muscular re which lasted for only four hours

CONTROLS

This form of treatment was difficult to assess previous routine treatments, including m procaine and physiotherapy, gave varying Several patients claimed that the relief after an of procaine did not start for twenty four hours then lasted three or four days and by the fifth original degree of pain had often returned. admitted much less benefit, with only a few hours' When the creams were rubbed deeply in, whether physician, the masseuse, or the patient, the effects were felt within a few minutes and l several hours at least Some of this relief c attributed to the massage, so 20 patients at sea were treated with a blank cream conta medicament

It was found that the physician or the masseuse induce some muscular relaxation and relief of pa patients with fibrositis even when using the blank The relief took longer to appear than when active were used, three minutes being the shortest time sary Pain returned in two or three hours to every save one in the series, this woman had no more for three weeks

When the blank cream was issued to outpatients home treatment, an interesting sequence of events observed In cases where there had been satisfac results from ephedrine or adrenaline there was no ch during the first week. In the second and third w the patients reported a gradual increase of pain stated that the ointment seemed to be losing its ef A return to the medicated cream always gave ben No patient with active fibrositis claimed relief after weeks of the blank cream, but the patient whose had been absent for three weeks had no return of pa the blank cream

PHYSIOTHERAPY

The creams gave relief for about the same perio the patients at Bermondsey, who received no ph therapy, as to those at Battersea, where heat and ma were routine On the other hand, only 5 of the Bermo sey patients showed steady improvement and o was fit to be discharged in the trial period, daily ap tions produced freedom from pain but not even temporary cures At Battersea temporary cures o complicating fibrositis were not unusual in pa with rheumatoid arthritis or osteo arthritis It se therefore, that physiotherapy was definitely bene in cases treated with medicated creams

COMPARISON OF CREAMS

In an attempt to compare the efficacy of the medicated creams and the blank cream the duration the relief obtained in roughly comparable cases fibrositis at the two hospitals are set out in the accompanying table

EFFECT OF MASSAGE WITH MEDICATED AND BLANK CREAM IN COMPARABLE CASES OF CHRONIC FIBROSITIS

Duration of relief	Adrenaline	Ephedrine	Belladonna	Contr
None				4 (4
Less than 4 hr	5 (24%)	6 (14%)	4 (25%)	12 (6
4–12 hr	7 (33%)	12 (28%)	4 (25%)	3 (11
12–24 hr	5 (24%)	12 (28%)	3 (19%)	0
More than 24 hr	4 (19%)	13 (30%)	5 (31%)	1 (5
Total no of cases	21	43	16	0

e alkaline and the acid components neutralise ther, the response of the acid secreting cells be estimated directly from the amount of acid d in the gastric juice

ollowing points have been established

mine and insulin stimulate the production of the d acid and alkaline components

components probably have the same composition in with peptic ulcers as in normal people

its with gastric ulcers secreted significantly less acid f patients with duodenal ulcers This difference can ined by a difference in peripheral secretory reactivity, sed with histamine

its with gastric or duodenal ulcers secreted signifi more alkaline component than did normal people patients with duodenal ulcers this can be entirely ed by supernormal peripheral secretory reactivity as l with histamine but in the patients with gastric here was also a supernormal reactivity of the central r connector unit to hypoglycæmia

patients with duodenal ulcers secreted significantly epsin than did the two other groups, this can be ed in terms of supernormal peripheral secretory ity, as assessed with histamine

division of the gastric juice into two hypothetical onents is open to criticism on the grounds that the esults are separated from the observations by a derable amount of arithmetic It is therefore worth dering any evidence which bears on the supposition two components do exist

litre of pure acid component is believed to contain m eq of hydrogen ion, and a litre of the alkaline onent is believed to contain 45 m eq of bicarbonate, a litre of acid component requires 160—45=3 56 s of alkaline component to neutralise it By extend- this calculation with the data of table 1 it may be ulated that neutral gastric juice ought to contain m eq of Cl^- per litre In fact very many of the ples of neutral gastric juice recovered by Ihre (1938) patients with pernicious anæmia or with gastritis ained such a concentration of chloride Further, ples of neutral gastric juice recovered by Dr A H es, of St Mary's Hospital, also contained this centration of chloride (personal communication) original two-component hypothesis was suggested Hollander (1938) by the fact that, when the concentra of neutral chloride in samples of gastric juice of was plotted against the concentration of acid, the nts fell on a straight line The general applicability this relationship to the gastric juice of man may be n from the accompanying figure Thus, though the pothesis ought to remain continuously under review, far it explains the facts which have come to light

The advantage of applying the two-component hypo sis may be seen by comparing the results of this amination of Ihre's data with a previous examination unt 1949) made without applying the two-component pothesis In the previous examination it was impos le to detect the supernormal central reactivity of ients with gastric ulcers

The interpretation of the relationship between the ounts of juice secreted in response to histamine and ulin is based on a number of untested assumptions, t it at least has the advantage of unifying the perimental data within one concept

The evidence which suggests that duodenal ulcer and stric ulcer are distinct diseases has recently been mmarised by James and Pickering (1949) The esent paper adds further points to their arguments

The finding of a supernormal central reactivity in the cretory mechanism of the hypothetical alkaline com onent in patients with gastric ulcers is of particular terest since it may explain the observation made by ames and Pickering (1949) that the acidity of the fasting astric contents after normal meals fell very considerably uring the later part of the night in most patients with gastric ulcers but did not do so in normal people or in patients with duodenal ulcers The concentration of chloride in neutral gastric contents obtained from a patient with a gastric ulcer was found to be 135 m eq per litre (personal communication), which fact together with other evidence suggests that neutralisation was not the result of extragastric contamination Thus one might suppose that the relative preponderance of the alkaline component in the gastric juice of fasting patients with gastric ulcers during the night is in part the result of a supernormal central reactivity There is in addition evidence suggesting that the central connection of the stomach influences the secretory response of the gastric mucosa to histamine, since the amount of acid secreted is reduced by two thirds after vagotomy in man (Oberhelman and Dragstedt 1948), hence peripheral overreactivity may well be the result of nervous influence

The data which have been considered were not obtained under normal conditions Thus it remains to be established that there is a relationship between the response to food and the response to histamine and insulin From work proceeding in this laboratory it appears that this correlation between the secretion in response to histamine and test-meal is in fact fairly close (Hunt 1950) This would encourage the transposition of the results for histamine stimulation to normal secretory function

At this point the more practically minded may well ask whether the new information given here does anything to explain the formation and persistence of peptic ulcers At the risk of stretching the significance of a few figures beyond reason, it is possible to outline the following tentative hypothesis

Patients with duodenal ulcers secrete more acid and pepsin than do normal people or patients with gastric ulcers in response to insulin and histamine, and possibly in response to normal stimuli They have in addition more acid gastric contents after meals Not only are the gastric contents more acid in patients with duodenal ulcer, but also the stomach tends to be emptied more quickly than normal, which may be an additional cause of injury to the duodenal mucosa Their gastric mucosa can resist this potentially harmful stimulus, but the mucosa of the duodenum cannot The first cause of the oversecretion perhaps lies in the peripheral gastric secretory mechanism but probably ultimately depends on tonic influence exerted through the vagus nerves

Patients with gastric ulcers do not secrete more of the potentially harmful acid and pepsin than do normal people, nor are their gastric contents more acid than normal. This fact suggests that their lesion is the result of a special susceptibility of the gastric mucosa Possibly the supernormal central reactivity which has been postulated for the secretion of the alkaline component of the gastric juice may be associated with the changed susceptibility of the gastric mucosa

SUMMARY

The secretory responses of the stomach to histamine and insulin in normal people and in patients with peptic ulcers have been analysed after the secretions have been divided theoretically into two hypothetical components containing the inorganic ions, and pepsin

The response to histamine has been used to assess the peripheral secretory reactivity of the gastric mucosa

The supernormal secretion of acid and alkaline components and pepsin by patients with duodenal ulcers can be entirely explained by their increased peripheral secretory reactivity, as assessed with histamine

The supernormal secretion of alkaline component by patients with gastric ulcers can be explained partly by an increased peripheral reactivity and partly by an overreactive central mechanism

The relevance of these points to the problem of peptic ulceration is considered

Hunt 1950) The suggested concentrations of ions in the two hypothetical components are shown in table I, which applies to juice not only from normal people but also from patients with gastric and duodenal ulcers It will be seen that one component contains acid, while the other contains bicarbonate which can neutralise the acid Thus the amount of acid recovered from the stomach in these tests is, by itself, no measure of the amount secreted, since various amounts of acid are neutralised by the bicarbonate-containing component

The data of table I may be used to divide samples of gastric juice derived from normal people and from patients with peptic ulcers into their two hypothetical components so that a secretory response may be assessed in terms of the volumes of acid component and alkaline component formed The method of calculation is as follows

Let Cl be the amount of chloride in a sample of juice (m eq)
A be the amount of acid in the same sample of juice (m eq)
N be the volume of alkaline component (ml)
P be the volume of acid component (ml)

Cl = amount of chloride in acid component + amount of chloride in alkaline component = concentration of Cl × vol of acid component + concentration of Cl × vol of alkaline component

$$Cl = 0\ 170\ P + 0\ 125\ N$$

Similarly,

A = amount of acid in acid component − amount neutralised by bicarbonate of alkaline component $A = 0\ 160\ P - 0\ 045\ N$

These two equations may be rewritten to read

$$P = 4\ 521\ A + 1\ 628\ Cl$$
$$N = 5\ 788\ Cl - 6\ 147\ A$$

By the use of these two equations Ihre's (1938) results for 18 normal males, 17 males with gastric ulcers, and

TABLE IV—MEAN AMOUNTS OF PEPSIN SECRETED IN RESPONSE TO HISTAMINE AND INSULIN

—	Normal people	Patients with	
		Gastric ulcer	Duodenal ulcer
Number of persons	18	17	13
Histamine (H) (units)	3634	3432	5472
Standard error	± 379	± 408	± 540
Insulin (I) (units)	8157	8923	15 044
Standard error	± 941	± 956	±1845
I/H	2 24	2 60	2 74
Standard error	± 0 35	± 0 41	± 0 42

13 males with duodenal ulcers have been expressed in terms of the volume of the hypothetical acid and alkaline components in each specimen recovered by Ihre during two 60 minute periods of stimulation with histamine and insulin (tables II and III)

RESULTS

Acid Component

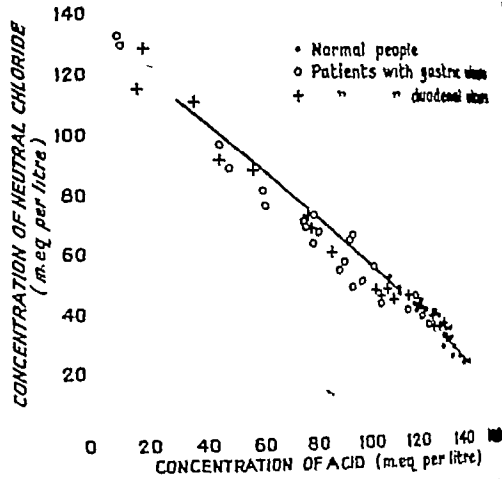
Table II shows that the patients with ulcers did not differ very greatly from the normal people in the volumes of acid component secreted in response to histamine, although the patients with gastric ulcers secreted slightly less, and the patients with duodenal ulcers slightly more, than the normal people The difference between the means for patients with gastric ulcers and those with duodenal ulcers is statistically significant

The same is true of the volumes of acid component secreted by these groups of people in response to insulin

The ratio I/H in table II can be taken as an expression of the reactivity of the receptors and central pathways after compensating for the differences in differing peripheral secretory reactivities The volume of acid component secreted in response to insulin has been divided by the volume in response to histamine for the three groups Although I/H varies a little from group to group, the differences are not significant Thus no real difference in the behaviour of their central pathways controlling the secretion of acid has been revealed between the three groups

Alkaline Component

Table III shows the volumes of the hypothetical alkaline component secreted in response to histamine and insulin



Concentration of acid plotted against concentration of chloride in gastric juices secreted during hypoglycæmia

by the same groups of people In response to the secretion of the patients with gastric ulcers was more, and of those with duodenal ulcers 100% than that of the normal people These between the three groups are statistically In response to insulin the same trend is apparent, the secretion of the patients with gastric ulcers approaches that of those with duodenal ulcers the difference between the patients with gastric and those with duodenal ulcers, which is apparent histamine, is not apparent when insulin is used stimulus This can be interpreted to mean that is a central overreactivity of the stimulating mech for the alkaline secretion in the patients with g ulcers as compared with patients with duodenal and normal people This is indicated numerically by I/H ratio of 1 44 + 0 15 as compared with 1 10 +

A more sensitive method of examining this point calculate the I/H ratio for each individual and to compare the mean values for the group This to the same conclusions as the previous method, that the I/H ratios for the alkaline secretion in pa with gastric ulcer and in normal subjects differ amount which would be expected to arise by chance once in a thousand times

Pepsin

Table IV shows the amounts of pepsin secreted same people in response to histamine and insulin patients with duodenal ulcers differ from the oth groups in that they secreted much more pepsin b response to histamine and insulin, but reference ratio I/H shows that the difference could be the re different peripheral secretory reactivity rather different reactivity of the central pathways

The interpretation of these figures for pepsin, ho is subject to a further qualification Histamine is considered not to stimulate pepsin producing ce only to wash out the preformed pepsin from the of the gastric glands The interpretation given for the results of the estimations of pepsin th includes an additional assumption that the amo preformed pepsin lying in the tubules may be us measure of the peripheral secretory reactivity pepsin secreting cells The correlation which ex any given person between the amounts of pepsin s in response to histamine, and in response to insuli a previous injection of histamine, is in accord wi assumption

DISCUSSION

The gastric juice has been considered as divisi an acid component, an alkaline component, and

THE LANCET

LONDON SATURDAY, SEPT 23, 1950

No Tools

E know now, because we have been shown,[1] that 1 the chest clinic physician is able to combine t-term hospital treatment of the patient with long- 1 domiciliary care, early tuberculosis can often be essfully treated, and the spread of infection ked But these results cannot be expected unless ias access to hospital beds, a properly equipped c, and enough staff In our present situation idely recognised as an emergency—chest physi s anxious to tackle the job on these lines ought be able to count at least on the necessary tools, f, and opportunities

'he modern chest clinic is the immediate descendant :he old dispensary Sir ROBERT PHILIP, in Edin gh, at the end of the last century, first devised a ensary and domiciliary service, conducted by erculosis officers, to supplement the work of atoria, and voluntary dispensaries were soon set elsewhere on the same pattern In 1912 most of se, with the rest of the tuberculosis service, became responsibility of the major local authorities The iety with which local authorities interpreted this onsibility is an old story Taken by and large, result was to produce a few first-class, some hocre, and many poor dispensaries Some of these were so badly housed and meanly equipped t the tuberculosis officers in charge of them might forgiven if they sank into despairing apathy av of them gave up hope of any particular achieve nt in such a stony field and concentrated on motion to the position of medical officers of health, l in time the post of tuberculosis officer came to widely regarded as mainly a stepping stone to the re senior office In 1948 the dispensaries suffered other change of master, and were handed over to National Health Service At one stride they came chest clinics, and the tuberculosis officers, often with no more equipment or help than they had ever had, became chest physicians to their areas Moreover the physicians were now required to serve two masters, giving eight-elevenths of their time to the regional hospital board for diagnosis and treatment, and three elevenths to the local health authority for prevention

Some chest clinics have seized their new opportunities to widen their scope The Willesden Chest Clinic, with the cooperation of the Central Middlesex Hospital, has demonstrated how much can be done by combined hospital and domiciliary care Such successes depend in part, however, on the accommodation, equipment, and staff at the disposal of the physician, and on the help he gets from his local hospital A few are very well served

The Paddington and Kensington Chest Clinic is one of the most spacious and best equipped Built by a voluntary committee in the years before the late war, it is set in a courtyard planted with flowers, and the pleasant modern building, with its large windows and fresh paint, has an air of competence likely to restore the spirits of a patient coming to be investigated He is welcomed in a light and airy admission room, and is radiographed within a few minutes of arrival. The physician has clinical control, and the right of admission, in two wards for the treatment of pulmonary tuberculosis in St Charles's Hospital, Ladbroke Grove If the patient requires chemotherapy or collapse treatment, these can be carried out either in his home or at St Charles's Hospital Really urgent cases can usually be admitted at once, and other patients wait only two or three weeks (Unfortunately there are not enough beds to serve all the patients in the area requiring inpatient treatment, and many still have to wait their turn for admission to sanatorium) When collapse refills are needed they can be given at the clinic in a large well-lighted room, fully equipped and reserved for the purpose There are enough health visitors to follow the case at home, enough clerks to look after the records, and enough record-storage space The staff do not seem harassed, and the atmosphere is friendly and hopeful

But compare the Paddington clinic's opportunities with those of a clinic in another part of London As a dispensary this clinic came under a metropolitan borough, and it is now one of two clinics in the biggest group of its particular region, serving a population of 450,000 people It is in the day to day clinical charge of an unestablished assistant physician, graded as a junior hospital medical officer, who works under the guidance of the one consultant chest physician to the group

During the war the old quarters housing the dispensary were bombed, and it was transferred into a requisitioned house nearby This, too, was badly shaken by the bombing, and it is now a derelict place indeed, the whole top floor being out of commission and the rest of the building showing serious cracks in the fabric No paint has been used on it since before the war, the name of the clinic is almost illegible, the gate is broken, the drive is weed grown, the rooms are dark and dingy Nothing could be more dispiriting to the patient he can only feel that both he and his disease are held in contempt by the authorities responsible for his care When the war ended, the borough might have repaired and painted the house, but they did not trouble, knowing that it would in time go to the National Health Service Since 1948 the clinic has belonged to the regional board and remains as it was, except for some further decay through the passage of time

The derelict shell would be tolerable if the equipment was good, but this is one of the clinics described by a correspondent, on p 413, as "unfit to undertake active treatment on any large scale" There is no X-ray plant, not even a screening apparatus Requests to the regional board to have one installed are met with a refusal, though the Ministry of Health has plenty of X ray equipment available for purchase Faced with the need to economise, the board is evidently unwilling to launch into an expense it has so far been able to avoid. So X-ray examinations are made at a general hospital by appointment, and normally take up to a fortnight to come through (By a curious anomaly of administration a patient who goes up without appointment, but with a letter from his family doctor, is radiographed on the same day) Since there is no screening apparatus at the clinic, refills for artificial-pneumothorax patients cannot be undertaken there, but in fact it would in any case be inadvisable to undertake them in such cramped, dirty, dangerous surroundings Refills are therefore done at one of the teaching hospitals

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Reviews of Books

Electroencephalography

A symposium on its various aspects Editors DENIS HILL, M B, F R C P, GEOFFREY PARR, M I E E London Macdonald 1950 Pp 438 £3 18*s*

IN the 15 years since it has been applied to clinical problems, electro encephalography has accumulated an extensive literature From time to time critical reviews of different aspects have been made by such authorities as Walter Jasper, and Lindsley, and Dr and Mrs Gibbs have produced their admirable atlas of records and their interpretation But there has been no authoritative presentation of the subject in which the basis of recording, interpretation, and clinical application is explained for the technician and the clinician To produce such a work calls for an understanding of such diverse matters as the physics of electronics and of wave form, of electronic construction, of the physiology of the neurone and the cerebral hemispheres, of experimental method, and also of the fundamentals of clinical neurology and psychiatry Because of this complex of needs, a group of workers including electronic engineers, physiologists, and biochemists have joined with Dr Hill in writing the eleven sections of this book These cover equipment, technique and interpretation, physiology, and biochemistry and pharmacology, and the basic material is integrated with the problems of epilepsy, intracranial tumours, injury, and mental disorder The text is large and full of technical language, and is clearly intended only for those who are going to take the subject seriously As is so often the case in technical books, the basic ideas have to be dug out of the overcast detail, and the going is slow, but to compensate for this there are abundant illustrations and the book has been well subedited and indexed The bibliography is complete to the end of the war, but includes little after that Though each of the contributors has bravely attempted to be comprehensive in his survey, there is a good deal of uncritical acceptance of minor papers by medical authors, which may have added to fact but not to knowledge This is least evident in those chapters written by a specialist on his subject, but it spoils those dealing with the investigation of gross cerebral lesions, which are the weakest part of the book

Everyone working in a department of clinical electrophysiology will use this as an authoritative work of reference Readers less closely engaged may acquire an awful respect for the subject which its achievements do not yet deserve

Children with Mental and Physical Handicaps

J E WALLACE WALLIN, PH D, visiting professor of clinical psychology, Upsala College London Staples Press 1949 Pp 549 42*s*

THERE are so few up-to date books on mental deficiency and its associated physical abnormalities that this volume should be welcomed with open arms by the educationists, social workers, psychiatrists, and pædiatricians for whom it was written When authors aim at such varied objectives, they often miss the target altogether and produce a book which is too simple for one section of their readers and too involved for others Professor Wallin's lucid style, however, enables him to present the many aspects of his subject with a simplicity which greatly helps the less informed reader and yet does not alienate the more erudite Moreover, his breadth of vision, wide experience, and understanding approach to the human problems of the mentally and physically handicapped will encourage the reader to [illegible] himself afresh to the educational and social difficulties that these children present After critically the various concepts of mental defi[illegible] its classification, Professor Wallin discusses th[illegible] physical lesions, such as endocrine and metab[illegible] turbances, encephalitis, epilepsy, and cerebral [illegible] Numerous modern references are given in each [illegible] mainly to American sources, and the 34 [illegible] well chosen

A second volume will deal with the ed[illegible] mentally handicapped children who do not [illegible] any special clinical type

Chirurgie Artérielle

G ARNULF, professeur agrégé à la Faculté de [illegible] de Nancy Paris Masson 1950 Pp 248 Fr

THIS work is written with Gallic clarity, and didactic authority to be expected from a pupil of [illegible] who contributes a foreword Each aspect of [illegible] is exhaustively dealt with in turn—ligature, anastomosis, arterial grafts and intubation and embolectomy—and each section is [illegible] historical references and by the results obtained author and other surgeons The chapter on [illegible] tomy is of particular interest just now, when the school are showing us how effective this proce[illegible] be in selected cases, and it is also evident that [illegible] Arnulf still has a soft spot for periarterial s[illegible] tomy used in a surprisingly diverse range of c[illegible] The final chapter, on the anticoagulants, is little sketchy, but the bibliography is magnificent. book should not be regarded as specialised readin[illegible] one for every general surgeon, for, as the author arterial surgery is often a matter of urgent treatment, and these depend on knowledge of and what cannot be expected from conservative surgery

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Analytical Psychology and the English Mind (L[illegible] Methuen 1950 Pp 242 18*s*)—Included in Dr Baynes's posthumous collection of eleven papers entitled "Freud versus Jung"—elaborated from a debate in which he took part, 23 years ago, with Dr Rickman His main criticism was of the mechanistic f[illegible] of Freudian doctrine, which has so little in common w[illegible] delicately cultured, faintly poetic, visions of Jung, high light of the paper is a comparison of Freud[illegible] Jungian interpretations of the same dream the summarily abandoned her Freudian analyst and to Jung because she was disappointed with the F[illegible] reading Perhaps in 1970 psychiatrists will look back debates as we do on the disputations of the mediaeval men It is hard to believe that Dr Baynes's essays of them on psychical research, all of them imbu[illegible] mysticism, and all hovering tentatively around the f[illegible] scientific thought, will have much impact except c[illegible] with a flair for chiaroscuro, and of course, on the con[illegible] but his style is scholarly, and his essays, written at times and for various purposes, have charm

Maladies et syndromes rares ou peu connus [illegible] Paris Masson 1950 Pp 335 Fr 920)—This com[illegible] of rare or little known diseases and syndromes, by Prof A Aimes, of Montpellier, must be [illegible] interest to physicians interested in the nature [illegible] clature, differential diagnosis and classification of and syndromes—especially those which are still [illegible] little known It includes probably the largest [illegible] collection of eponymous names and illustrates the un[illegible] abundance of synonyms Names and synonyms are p[illegible] increasing in number and no work on the subject regarded as final As knowledge increases, many o[illegible] will be weeded out, except for their historical inter[illegible] the other hand newly recognised diseases and syndr[illegible] be added and named

A feature of this book is the great number of university medical theses referred to in the bibliog[illegible] of course mostly French—many of them up to dat[illegible] graphs on rare or little known diseases and syndrom[illegible] need not mention all these universities By far the [illegible] are theses of Paris and, fortunately, they can m[illegible] consulted at the library of the British Medical As[illegible] in London Exhibitors of puzzling cases at medical [illegible] would often do well to glance at this book before them forward

orns in which the conception rate rose from o 70% when a high calcium/phosphorus ratio feeding stuffs was corrected [2] Though some rities, such as GOULD,[3] do not believe that g cattle on modern leys has any connection with ility, a note of caution is certainly not out of and further research on the possible effects of m grazing on the endocrine and reproductive ms of ruminants needs to be done before it can be concluded that the new leys are an unmixed ing An outstanding case of reproductive failure razing animals following the introduction of oved methods of pasture management was pro d by the sheep of Western Australia which ed to breed normally when they were put on ures rich in subterranean clover [4] The cause ed to be an œstrogen in the clover, and it is worthy that significant quantities of œstrogen e since been detected in British pastures In stern Australia it was found that beef cows throve reproduced normally on the pastures so inimical he breeding of sheep, but this does not exclude the sibility that the revolution in British pasture ctice which is now taking place may not in the g run affect the breeding capabilities of our stock least this is a risk that should not be absent from thoughts of those responsible for our animal earch programmes

Recent findings on the relation between endocrine d nutritional factors also raise other possibilities at deserve attention The work of BISKIND [5] licates that vitamin B deficiencies, by lowering the er's capacity to inactivate endogenous œstrogens, ay induce supernormal body levels of œstrogen, ich in women may lead to menstrual disturbances ompatible with normal reproductive function her dietary abnormalities, such as lack of lipotropic tors or ingestion of toxic substances which interfere th liver function, may have similar effects More er, the work of HERTZ [6] has shown that a sufficiency certain vitamins such as folic acid is essential for rmal growth and other responses of accessory xual organs to the action of œstrogen These amples emphasise the interplay of nutritional and idocrine factors in reproductive function, and suggest at, on further investigation, the problems of infer- ity in cattle may prove inconveniently complex

Hæmatology

HÆMATOLOGY, which many people still regard as ubdivision of clinical pathology, has now developed o a subject of sufficient scope for important ernational congresses Gone are the days when it s mainly concerned with minutiæ in the morphology blood cells and the technique of cell counting— en it was the province solely of the microscopist e delegates at Cambridge comprised physicians, ysiologists, and pathologists, and it was notable it, whereas the clinical pathologists were perhaps the st numerous group, academic pathology was very ntily represented This illustrates the fact that hæmatology has outstripped the information to be got from the histological section and considerations of morbid anatomy Moreover the old battles about nomenclature seem to have died away The recent proposal of an American clarification committee to adopt a new nomenclature for erythroblasts has met with little favour, judging by papers given at the congress it seems to have been quietly dropped, for only one speaker used the proposed new names The expected battle over the nomenclature of the Rh subgroups also seems to have been averted, apart from Dr WIENER himself, hardly any speaker used the Rh Hr terminology, the majority having adopted R A FISHER's CDE nomenclature

Hæmatologists today must still use the morphology of blood and bone marrow cells as one of the pillars of diagnosis, but the limits of permissible variation are set far more widely than twenty years ago New methods are being applied, and several workers showed electron microscope photographs of blood cells, but so far these are of purely academic interest, since no one knows just how artificial the pictures are The main interest in hæmatology, as in some other branches of medicine, is now directed to the "pathological physiology," to sorting out the why and how of the disordered function in disease, and to utilising the information so gained for the refinement of diagnosis and treatment As our report shows, the great majority of papers given at the congress dealt with these matters The physiologists have taken up the subject of coagulation of the blood, and, though the number of "factors" discovered has produced some fog, we already have a much clearer idea of the ætiology of many disorders of blood coagulation and of what is and what is not practicable in therapeutics The discovery of folic acid and of vitamin B_{12} has reopened the whole question of the nature of the anti pernicious-anæmia factor and how it works Here biochemists, physicians, and pathologists cooperate in the research The biochemists, even though they have a preliminary indicator in the growth of suitable lactobacilli, cannot be certain of the clinical activity of the fractions they have prepared until they are actually tried on a patient with pernicious anæmia in suitable relapse, this in turn depends on the careful correlation of the bone marrow changes with response to materials of known activity A new development evident at the congress is the increasing use of histochemical methods on blood and bone marrow cells, either directly or on cells artificially maintained by tissue culture techniques The minute biochemical changes caused by such substances as folic acid antagonists can now be followed in astonishing detail. The properties of heavy and radioactive isotopes are being applied to the problems of hæmatology, and many problems of metabolism have thus been solved by methods more precise than the roundabout techniques needed before, for example, the congress heard striking accounts of the work done on the metabolism of iron and hæmoglobin The study of blood groups has reached a high degree of complexity, and there is now enough information to enable the statisticians to add their contribution and so baffle the purely medical man But, despite the genetics and the streamlined techniques for distinguishing one factor from another, immunohæma-

Manchester Guardian Sept 5 p 9
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The chest physician has no beds in the area into which he can admit patients When a new case comes to him all he can do is to fill in a form A man has to wait an average of five months for a bed, a woman over a year Because he cannot admit them for a few days to hospital, any domiciliary treatment he can give must be on the simplest lines He can order bed rest, he can and does give *p* aminosalicylic acid, in suitable cases he can use streptomycin, and if all goes well he can keep them fit for collapse therapy later He has not enough staff to undertake any further domiciliary treatment Besides himself and his assistant physician, he has three health visitors and an almoner working at the clinic, but there is a population of over 150,000 to be served, and there are 13,019 people on the clinic register Each of the health visitors has more than 450 on her visiting-list What does such wholesale neglect of the tuberculosis load mean in terms of spread of infection? Moreover, there are only 28 tuberculosis beds—all for men—in the entire borough, and these have to receive cases from all over the region There are no beds for women at all Though the men's beds are under the care of the clinic chest physician, he is not allowed to admit patients to them, and they are mainly filled with chronic dying cases, all with positive sputum, for whom no other refuge has been found Some of these are careless and untrainable in their habits The nurses—mostly young Irish girls—dread (reasonably enough) having to nurse them, and some have been reported to suck their arms after a Mantoux test rather than risk a positive result These patients need hostel care in the charge of well seasoned older nurses We shall never be able to get the early cases nursed in an atmosphere of hope and enthusiasm if we expose young girls to this kind of risk it can only increase the prejudice against tuberculosis nursing

And this, unhappily, is no isolated example The physician in charge is only one of a body of keen and capable men, up and down the country, who are not able to do the work for which they were appointed, because they lack the barest tools of their trade The use of B C G is now to be added to their already impossible load, and how can the experiment be made with the necessary detail and thoroughness in such circumstances? The clinics cannot finish—or even begin—the job without the essential tools rooms, X ray plant, staff, and access to beds To some extent, no doubt, the Minister's request to the general hospitals will improve matters many are likely to fall in with it, and to release at least a few beds to the chest physician to use for his own purposes But this measure requires to be supplemented by a more general respect for the needs of the tuberculous Some years ago Dr BRIAN THOMPSON,[2] in a study of 406 cases, found that of any 8 patients with positive sputum only 2 could be expected to survive five years, and only 1 ten years His results indicate, in other words, that sputum positive tuberculosis has a considerably worse prognosis than many forms of cancer Many of the people so threatened can be saved, as Willesden is showing by an effective clinic service, yet at present the effort necessary to save them is not being made

2 *Tubercle* 1942 23 139

Infertility in Cattle

NOBODY knows just how much milk and meat is lost to this country each year through infertility in cattle, but all agree that the loss is very large indeed The term "infertility" here covers everything from outright sterility down to mere delay in getting cows or heifers into calf Sometimes (usually in winter) this delay is due to periods of anœstrus, but some animals repeatedly fail to become pregnant even when the œstrous cycle is more or less normal, and it is these more subtle forms of infertility that are most baffling to the research worker and the practising veterinarian The serious economic problem facing our dairy industry makes it necessary first to ascertain the extent of the trouble and then to find ways of overcoming it The establishment of a network of artificial insemination centres, at which breeding records are kept, should soon provide statistics that will clearly reveal any fluctuations in breeding efficiency among dairy cows indeed an analysis of existing records has already displayed variations in fertility, observed at two centres, for which no cause was found[1] It is satisfactory to learn that the artificial insemination authorities are also making a survey of fertility levels in herds using natural service

It is often said that the cows producing most milk are most prone to reproductive difficulties, from which the conclusion is drawn that breeding for high milk production is responsible for the apparent decline in fertility in recent years Though there seem to be no figures proving that this contention is in fact correct, it should not be forgotten that both lactatory and reproductive functions owe allegiance to the pituitary gland, and it is quite conceivable that breeding for high milk production results in the selection of a pituitary which secretes less of the gonadotropins controlling reproduction and more of the prolactin and other hormones (such as somatotropin and perhaps A C T H) important for lactation In many species lactation is associated with a quiescent state of the ovaries—the so called lactation anœstrus Though the physiology of this phenomenon has never been fully worked out, it seems likely that, if a high output of prolactin is one of many necessary or limiting conditions for a high milk yield, the antigonad action of prolactin may in some way be involved Further work on these endocrine mechanisms might well increase our understanding of the relation between high milk production and fertility

Another school of thought has sought to correlate reduced fertility in cattle with nutritional factors Thanks to the efforts of STAPLEDON and his followers, the modern tendency in this country is all towards pasture improvement, and if it is true that our best producing animals are more prone to "physiological" reproductive difficulties than their less well bred sisters, we must bear in mind that it is precisely these bovine aristocrats that are generally the best fed and most likely to have access to modern lush leys It has been suggested that a diet with excess of calcium in relation to phosphorus—which could arise from excessive application of lime—may interfere with breeding efficiency, and at the conference of the National Veterinary Medical Association held at Cardiff this month Mr S L HICNETT referred to a herd of

1 Edwards J *Brit J Nutrit* 1949 3, 87

shorthorns in which the conception rate rose from 30% to 70% when a high calcium/phosphorus ratio in the feeding stuffs was corrected[2] Though some authorities, such as GOULD,[3] do not believe that feeding cattle on modern leys has any connection with infertility, a note of caution is certainly not out of place, and further research on the possible effects of modern grazing on the endocrine and reproductive systems of ruminants needs to be done before it can safely be concluded that the new leys are an unmixed blessing An outstanding case of reproductive failure in grazing animals following the introduction of improved methods of pasture management was provided by the sheep of Western Australia which ceased to breed normally when they were put on pastures rich in subterranean clover[4] The cause proved to be an œstrogen in the clover, and it is noteworthy that significant quantities of œstrogen have since been detected in British pastures In Western Australia it was found that beef cows throve and reproduced normally on the pastures so inimical to the breeding of sheep, but this does not exclude the possibility that the revolution in British pasture practice which is now taking place may not in the long run affect the breeding capabilities of our stock At least this is a risk that should not be absent from the thoughts of those responsible for our animal research programmes

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2 *Manchester Guardian* Sept 5 p 9
3 Gould, G N Proc Conference on Grassland and Animal Health National Veterinary Medical Association of Great Britain and Ireland 1948 p 51
4 See *Lancet* 1950 i 550
5 Biskind, M. S *Vitamins and Hormones* 1946 4 147
6 Hertz R *Recent Prog Hormone Res* 1948 2 161

tology (as it is called) has an oddly old-fashioned air Just as the hæmatologists of two generations ago delighted to describe, say, a new cell with black granules instead of red, so the blood group experts report every serum they come across that will not fit those already docketed, and give it an imposing name bearing no relation to its relative importance, and there is no indication of when, or why, this collection should cease Much hæmatology, of course, lacks a really scientific basis, witness the discussions on hypersplenism and hæmolytic anæmias, but efforts are constantly being made to find out the details of disordered function that will give that basis Naturally new treatments were discussed at some length, but the shocks experienced over folic acid have induced a welcome scepticism and a desire for long-term studies that has extended to the latest panacea, adrenocorticotropic hormone

The proceedings at the congress should convince anyone that the study of advanced hæmatology is no longer a spare-time amusement for medical men primarily occupied in other fields If hæmatology is to be advanced on desirable lines, then the physician, pathologist, or physiologist who takes it up must make it his main interest To learn enough hæmatology for the routine run of clinical consultation, pathological diagnosis, or physiological teaching is not difficult, but if patients are to be given the best of diagnosis and treatment, and if research into the pathology and physiology of blood disorders in all their complexity is to be furthered, a higher degree of specialisation will be required Today hæmatology can fairly claim any advantages obtainable from full specialist status

Annotations

DOUBTS ABOUT THE TREATMENT OF POLIOMYELITIS

Stimson [1] draws attention to many uncertainties over the best methods of treating acute poliomyelitis He considers the possible dangers of transporting patients long distances for admission to hospital, and refers to some observations suggesting that long journeys in the early stages of the illness induce more severe paralysis He points out that it is also uncertain (1) whether lumbar puncture should be carried out in all cases, (2) whether the patient should be hydrated or dehydrated, (3) what is the proper use of sedatives, (4) whether muscle relaxing drugs should be administered, (5) what is the right treatment for urinary retention, and (6) what is the proper use of postural drainage and tracheotomy

Certainly it is not always easy to get scientific guidance on what should be done It is now widely held [2] that complete rest and muscular relaxation in the preparalytic stage increases the resistance of the spinal cord cells, and we must therefore bear in mind the possible harm done by long anxious consultations, exhausting physical examinations, lumbar punctures, and removal to hospital. It is essential, of course, to exclude meningitis, for this requires immediate specific treatment, but once this has been excluded, perhaps the less done in the preparalytic stage the better, apart from ensuring that the patient gets plenty of sleep As regards treatment in the chronic stage of the disease, too, there are many different opinions, and reliable observations on the value of various methods of physiotherapy are strikingly few In short, the present position leaves much to be desired, and there is need for a special effort by research workers who have a good knowledge of the physiology of spinal cord, nerve cell, and muscle Bourdillon et al [3] have been applying modern physiological knowledge to the study of cases treated in mechanical respirators, and this is a useful step in the right direction

THE LIQUORICE STORY

THE folk lore of medicine yields ample evidence of man's credulity as well as his enterprise Extravagant claims have been confidently made for an infinite variety of plants, only a minute proportion of which survive in our pharmacopœias But, like the fish in the sea, there may still be as good drugs in the vegetable kingdom as ever came out of it, and the pharmacologist must remain on the alert for discoveries in strange places

In ancient China, and to the Greeks and Romans, liquorice "was almost an elixir of life" [4], but the therapeutic virtues of glycyrrhiza have since been rated more modestly, and during the present century—in belated recognition of the pharmacological insight of etymologists—the sweet root has been taken at face value and has performed only the lowly if useful office of a flavouring believed to be inert In our present issue, however, Professor Borst and his colleagues at Amsterdam relate how clinical observations on the supposed value of liquorice in the treatment of peptic ulcer raised a suspicion that it contains a potent substance In many people, it seems, it produces an œdema which is not allergic in origin, and the wonderfully patient observations now recorded show that in normal subjects the Dutch liquorice extract taken by mouth has effects qualitatively identical with those of injected deoxycortone Whatever may be the exact mechanism of its action, this evidently depends on the presence of normally functioning adrenal glands, which means that liquorice extract cannot be used as a substitute for deoxycortone in Addison's disease Moreover, despite similarities in the biochemical pictures produced by adrenocorticotropic hormone (A C T H) and liquorice extract, the latter is ineffective in rheumatoid arthritis

This fascinating investigation in Holland provides an interesting point of contact between those who work on plant hormones and the researchers in animal endocrinology Though the demonstration of a new deoxycortone like substance does not in itself carry us much further in the therapeutics of adrenal deficiency, the discovery of a vegetable extract which reproduces the actions of a steroid hormone offers opportunities that will not be ignored by the pharmaceutical industry A finding of minor but practical importance is that where water retention is particularly dangerous—e g, in incipient heart failure—liquorice is a drug to be avoided

THE NAMES OF VIRUSES

FOR some years students of plant pathology have been concerned to devise an orderly system of naming viruses, whether on the Linnean binomial, the numerical, or some other system "Animal virologists," on the other hand, have felt no such urge, holding that in the present state of knowledge a codified system of naming is neither desirable nor practicable In 1939 F Holmes published a comprehensive binomial system dealing with plant viruses, and in 1948, in the last edition of Bergey's *Manual of Determinative Bacteriology*, he extended this to cover all viruses, including even phages The rabies virus was to be called *Formido inexorabilis* Holmes, the common cold virus *Tarpeia premens* Holmes, and so on Quite apart from the desirability of suddenly introducing a system covering all viruses, Holmes's attempt in

1 Stimson P H *J Pediat* 1950 36, 704
2 Russell W R *Brit med J* 1949 i 465 Horstman D M. *J Amer med Ass* 1950 142, 236
3 Bourdillon R B Davies Jones E Stott F D, Taylor L M *Brit med J* Sept 2 1950 p 539
4 Schofield M *Pharm J* July 29 1950 p 76

the animal virus field was conspicuously unsuccessful, many unrelated viruses being lumped together and closely related ones placed far apart A generally acceptable system could perhaps hardly be hoped for when a plant virologist, however well meaning, strayed into a field strange to him The fundamental weakness of the system, both as regards plant and animal viruses, was its emphasis on symptomatology as a basis for classification, with relative neglect of intrinsic properties of viruses

Most British workers have felt that so unsatisfactory a system could safely be allowed to die a natural death There is, however, a danger in such a course Though experienced workers on animal viruses, almost to a man, reject the system, some may feel that its inclusion in Bergey's *Manual* gives it authority In fact, writers in some American journals have begun to use these names, and it seemed possible that the pitch would be queered before the classification and naming of animal viruses was undertaken with due deliberation by those best qualified for the difficult task. We therefore welcome heartily the initiative of the International Congress of Microbiology, which met during August at Rio de Janeiro This body resolved, first, that no decision should be taken at present to determine the valid starting date for virus nomenclature, and secondly that, pending acquisition of further knowledge, the use of a comprehensive system of scientific virus nomenclature was unwise At the same time the congress took steps, through a subcommittee of its international nomenclature committee, to promote serious study of the nomenclature and classification of viruses The effect of all this should be, on the one hand, to encourage orderly consideration of these subjects, and on the other, to make it clear that premature attempts to classify and name all viruses in advance of adequate knowledge are likely to hinder progress rather than help it

FINANCING THE SERVICE

THE present hospital accommodation for mental patients is far short of what is needed A memorandum on hospital estimates (B.H.B [50] 80), issued by the Ministry of Health, tells us that, apart from the present overcrowding to the extent of 14%, insufficient provision is being made for greater demand resulting from the increase in the population and from any increase in mental illness But boards and committees are again enjoined, in framing estimates for 1951–52, not to provide "for any developments which are not essential and urgent those which are merely desirable improvements must be deferred." Approval of management committees' estimates, which was delegated to regional boards only six months ago,[1] becomes again the prerogative of the Minister, who has lately called also for a running check on expenditure (B.H.B [50] 41)

Hospital expenditure has lately been examined by the Committee of Public Accounts,[2] which observes that "if a suitable system of costing can be devised without excessive elaboration or staff cost, this should be a useful contribution to the economical administration of the hospitals" As to remuneration of professional people in the service, some of the assumptions which underlay the determination of payment have been proved false

"it was assumed that there would be an increase in doctors expenses of 55% over the 1939 figures dentists expenses were taken without any independent evidence as 52% of gross earnings it was estimated that dentists could not work more than 1500 chairside hours a year involving about 1900 hours total work, without detriment to their efficiency it was thought that the number of prescriptions dispensed by chemists would increase from 70 million a year under the old insurance scheme to 140 million under the Health Service, and it was expected that private sales of drugs and appliances and private ophthalmic practice would be reduced"

The Ministry of Health now thinks that dentists can work considerably more than 1500 chairside hours a year without loss of efficiency "Dentists' earnings have been generally in excess of the Spens ranges, they have been considerably higher than those of doctors and the Ministry think it would be a serious state of affairs if this continued." Cuts in remuneration have been imposed, and the Ministry is now obtaining further information on earnings and expenses With regard to doctors, "the Departments are not yet able to form precise conclusions," but "the available evidence suggests that the earnings of the general practitioners as a whole may have somewhat exceeded the Spens ranges"—assuming of course that (in the light of other professional incomes) an addition of 20% compensates adequately for the change in the value of money since 1939 The number of prescriptions dispensed by chemists in 1949–50 was about 200 million instead of the expected 140 million Their remuneration has been reduced, but the Departments do not know the total payments made to individual chemists The Departments were also unable to provide information about the total earnings of individual opticians

"THE EXTINCT APE-MEN" MORE DISCOVERIES

AMONG the demonstrations which attracted particular attention at the International Anatomical Congress at Oxford was a series of photographs, exhibited by Dr R Broom, F.R.S, and Mr J T Robinson, illustrating some of their recent discoveries of Australopithecine remains at Sterkfontein and Swartkrans It is no exaggeration to say that these new finds are spectacular, for in several respects they are far more complete and perfectly preserved than any of the numerous remains of the Australopithecinæ already known Natural size photographs of two fine lower jaws from Swartkrans (two out of the several mandibular specimens which have so far been recovered from this site) demonstrated the massive character of the mandible and its close resemblance in shape and general proportions to that of early types of man They showed every tooth in position and in a perfect state of preservation The morphological details of the dentition are those which are now known to be a consistent feature of the South African "ape men" (as indicated by at least seventeen specimens of upper and lower jaws)—that is to say, parabolic contour of the dental arcade, large molars and premolars, anterior premolars of the non sectorial human type, exceedingly small canines showing the earliest stages of attrition with flat wear at the tip, small incisors, and no diastema Another photograph showed an Australopithecine os innominatum recently discovered at Swartkrans—the third pelvic bone of these extinct creatures to be found Like the first specimen (discovered by Dr Broom in 1947 at Sterkfontein) it was found in situ, in direct association with jaws and teeth. It shows the same fundamentally human shape and proportions (very different indeed from that of anthropoid apes), but at the same time reproduces certain of the distinctive features already noted in the other specimens, whereby it makes an interesting contrast with *Homo sapiens* But perhaps the most striking photographs on exhibition were those of two large Australopithecine skulls found by Dr Broom and Mr Robinson at Swartkrans only a few weeks previously, a brief reference to which appeared in the *Times* on July 26 In one of them, as Dr Broom has already reported, there is a small sagittal crest such as is usually developed in male gorillas (and sometimes orangs) This is clearly due to the development of powerful temporal muscles associated with the massive jaws, but in these two specimens the photographs made

1 See *Lancet* 1950 i 403 426
2 Fourth Report from the Committee of Public Accounts. Session 1950 H.M. Stationery Office Pp 27 9d

it clear that the skull as a whole (as well as the dentition, which includes as usual a remarkably small canine) shows many differences from that of a gorilla or orang, particularly in the contour and morphological details of the supraorbital and frontal regions In these characters, indeed, they display a most interesting resemblance to primitive hominids such as Pithecanthropus

The vast amount of material which has now been collected by Dr Broom and Mr Robinson (and which is still being collected) surpasses anything of the sort which has ever been known before Not the least interesting feature of all the new discoveries is the abundant confirmation which they provide of the conclusions drawn by the South African scientists from their study of the first remains of the Australopithecinæ which were found quite a number of years ago Whether these ape like creatures can be properly termed "missing links" depends, of course, on how this term is understood At least it can hardly be doubted, particularly with all the new evidence which has been recently accumulated, that they come much nearer to the popular conception of a "missing link" than anything else so far discovered

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JUST over a year has passed since Hench and his colleagues [1] at the Mayo Clinic first announced the effect on rheumatoid arthritis of 'Cortisone' and A C T H A symposium [2] from this centre measures the distance covered in the subsequent surge of exploration

Hench [3] confesses that how these substances work is still a mystery What does seem clear is that their action is not on the ætiological irritant but on the tissue reactions to that irritant Dr John R Mote (whose remarks are summarised on another page) expressed the same thought last week at the first International Congress of Internal Medicine when he suggested that cells were "immunised against their environment" Hench points out that these substances can be credited with an impressive number of "firsts" They are the first natural agents by which has been demonstrated the potential reversibility of several diseases, including rheumatoid arthritis They are the first agents which have shown real promise of affecting certain features of acute rheumatic fever and acute rheumatic carditis that are not influenced by salicylates They are the first natural or hormonal agents found capable of consistently giving symptomatic relief and a temporary reprieve in the face of an intercurrent severe acute crisis of disseminated lupus erythematosus Apart from adrenaline, they are the first hormonal agents with pronounced anti allergic properties They are the first which apparently have the power of suppressing certain ocular lesions that have previously been difficult to control and have produced much blindness Finally, for the first time potent adrenal cortical hormones are available for long term studies of the psychological changes accompanying extensive physiological change

Of 23 patients with severe or moderately severe rheumatoid arthritis [4] who have been followed up for 7–14 months after administration of one of these hormones was discontinued, 8 had maintained 60–90% of their initial improvement, 5 had maintained about 50%, and the remaining 10 had maintained little or none From investigation of 10 patients with rheumatic fever [5] who were examined on average 5 9 months after dismissal from hospital, it was concluded that either cortisone or A C T H can effectively suppress the acute manifestations of this disease, but when treatment is discontinued these manifestations will continue to reappear until the rheumatic state has come to its natural end Whether either drug helps to prevent rheumatic carditis is not clear, but it does seem that they can greatly improve the condition of some patients with established carditis In acute disseminated lupus erythematosus [6] arthralgia, fever, eruption, and serositis are suppressed, and there is greater sense of well being with increased appetite and gain in weight Ability to withstand stress and crises is also improved, and some degree of true remission may occur Laboratory findings remain, however, abnormal, the pathological reactions of the tissues are unaffected, and relapse follows discontinuation of treatment The administration of cortisone to patients with hay fever or bronchial asthma [7] resulting from sensitivity to ragweed pollen always promptly relieved symptoms—rather more promptly in asthma than in hay fever—but once again the benefit ceased soon after treatment was stopped In ulcerative colitis [8] there is sometimes subjective relief, but no objective improvement as judged by proctoscopic and radiological examination In acute leukæmia [9] remission may be complete but is only temporary In chronic lymphocytic leukæmia and in Hodgkin's disease remission is at best partial, and is again temporary Ocular inflammation [10] associated with arthritis appears to be controlled by cortisone, and the symptoms—and more slowly the signs—of vernal conjunctivitis are relieved Evidence is accumulating that in glomerulonephritis [11] associated with œdema cortisone may produce a beneficial diuresis In periarteritis nodosa and cranial arteritis [12] clinical remission and sometimes possibly improvement in the pathological process are evoked As to psychiatric aspects,[13] "the sudden and profound variation in the *milieu intérieur* which so markedly affects the patients' metabolic homeostasis is similarly disruptive of his psychological adaptation The variety and degree of this disruption seem to be the resultant of many vectors" In Addison's disease [14] cortisone given together with deoxycortone acetate has yielded excellent results, and cortisone appears to dispel the serious reactions that may follow radical subtotal adrenalectomy for Cushing's disease In myasthenia gravis [15] transitory improvement has been noted

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INTERNATIONAL CONGRESS OF HÆMATOLOGY

THIS congress was held in Cambridge from Aug 21 to 26 The third of its kind, it was the first held outside the U S A, and it gave many of its 450 members their first opportunity of meeting their correspondents from other countries It provided excellent facilities for "making the bibliography come to life"

THERAPY OF ANÆMIAS

The first session, with SIR LIONEL WHITBY, president of the congress, in the chair, led off appropriately with a talk by MR LESTER SMITH, D SC, on vitamin B_1 He said that the molecular weight is now estimated at 1650 ± 100, various bits of the molecule have been identified but a large part, including the place of the cobalt attachment, remains unknown Three other clinically active related factors have been identified, but their chemical differences are not sorted out Dr BYRON HALL (U S A) reminded us that vitamin B_{12} by mouth has little effect even in large doses, divided or daily Dr GRACE GOLDSMITH (U S A) thought that 4 µg injected daily gave results poorer than liver extract and reported failure with oral treatment, though in sprue and nutritional macrocytic anæmia 5–30 µg by mouth daily did evoke some response She recalled that a good hæmopoietic response has been obtained in pernicious anæmia when 5 µg of B_{12} is given orally together with a duodenal extract, but she did not mention what was the effect of the duodenal extract alone Finally she suggested that vitamin B_{12} may not maintain pernicious anæmia patients at proper blood levels for long periods

Dr J G A MCSORLEY recapitulated his published work on the isolation of materials with B_1 activity from sources such as fæces He also pointed out that the vitamin left the leucopenia unaffected in four cases of pernicious anæmia, and five others had relapsed on 40 µg parenterally per month Dr J C PATEL (India) had found among patients with tropical megaloblastic anæmia that those with free HCl in the gastric juice often respond to B_{12} orally in doses of 20–600 µg daily, some of the achlorhydrics showed an irregular response, but in true pernicious anæmia there was no response at all Dr L WEISSBECKER (Germany) commended cobalt for the treatment of anæmia in infection, and oddly enough for Mediterranean anæmia

In the discussion Prof P A OWREN (Norway) produced more evidence that vitamin B_{12} is *not* the anti anæmic principle and that responses to it are partial. He showed that the prothrombin concentration is low in untreated pernicious anæmia and remains low when B_{12} treatment has raised the hæmoglobin, folic acid has the same effect, but some liver extracts will restore the picture He also pointed out that abnormal hæmoglobin of fœtal type remains, and macrocytosis persists, with B_{12} treatment

During a later session Dr O LARSEN (Norway) described the occurrence in pernicious anæmia blood of large thin cells which he called macrocytes—in contradistinction to megalocytes which are large cells of normal thickness It is these cells that cause macrocytosis persisting long after the mean cell volume becomes normal under treatment, they have a life span of 40–60 days, and a considerable proportion of their hæmoglobin appears to be fœtal Treatment with vitamin B_{12}, folic acid, and some commercial liver extracts fails to influence the macrocytes and Dr Larsen suggested that liver contains another factor necessary to produce a completely normal blood picture This factor had been separated and is not hæmopoietic in the usual sense

Dr M BEARD (U S A) had a group of thirty seven patients who were being treated with liver extract not all satisfactorily They were transferred to vitamin B_{12} treatment, 30 µg *monthly* At first they did well, the patients with low counts rising to normal levels But after 7–11 months the counts fell and the M C V rose again Increase of B_{12} up to 100 µg weekly had no effect, equally ineffective were supplements of folic acid pyridoxine, iron, and ascorbic acid Most of the patients had inadequate protein in their diet, and Dr Beard thought that a factor in liver protein might be necessary for full recovery in pernicious anæmia Dr K HAUSMANN (Germany) described the isolation, from many sources, of fractions with B_{12} activity, and showed that some of the cobalt containing pigments will support growth of appropriate lactobacilli, but are not clinically active

Dr J F WILKINSON remarked that the dosage of B_{12} is steadily on the upgrade and he now gives 20–60 µg weekly, but, even so, glossitis and poor counts persist in some cases Allowance must be made for the big variation in individual requirement of active material in patients with pernicious anæmia, hence only reasonably large series of cases are useful for estimating dosage Dr C C UNGLEY said he now gives a minimum of 60 µg weekly, increasing up to 200 µg if there are neurological complications

ÆTIOLOGY OF LEUKÆMIA

Dr J HOOGSTRATEN (Canada) felt that the evidence of tissue culture should make us pause before placing human leukæmias firmly among the neoplasms, though the evidence from animal leukæmias seems firm enough Dr J N DAVIDSON had estimated deoxyribonucleic acid (D N A P) and ribonucleic acid (R N A P) in the blood and marrow cells in leukæmia The amounts present per cell were roughly the same in normal and leukæmic cells—the figures are given in ten millionths of a microgramme The ratio D N A P/R N A P falls in acute leukæmia when folic acid antagonists are given, and rises again when a relapse is on the way Other papers were given by Dr LAVES (Germany) and Dr POLLI (Italy) on cytochemistry, Dr UNDRITZ (Switzerland) on mitotic abnormalities, and Professor CHEVALLIER (France) The discussion showed that little advance has been made in this subject

HÆMOGLOBIN METABOLISM

Prof CARL MOORE (U S A) said that studies with radioactive iron have confirmed that ferrous is superior to ferric iron for oral treatment, about 26% of an oral dose is utilised as hæmoglobin iron from ferrous salts but only 6% from ferric salts The normal person absorbs 2–11% of an oral dose of iron, so the intestine is not completely selective It is common practice to give ascorbic acid to patients with iron deficiency anæmia, and study of this practice shows that ascorbic acid assists absorption of iron from protein foods Iron is excreted in appreciable amounts by various routes, including the sweat, in males the average daily loss is about 1 mg of iron in women the figure is raised to 15–20 mg by menstruation Iron has been shown to pass from mother to fœtus Finally Professor Moore made the welcome announcement that "easily split-off iron" is an artefact

Dr I M LONDON (U S A) said that by using N^{15} to label glycine (aminoacetic acid) which is specifically utilised for the synthesis of porphyrin and so hæmoglobin it has been found that the average life of the normal red cell is 120 days and that destruction follows a regular pattern over 100–150 days In sickle cell anæmia the destruction pattern is quite random in pernicious anæmia survival is short and destruction random, in polycythæmia vera there is an increased

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The vast amount of material which has now been collected by Dr Broom and Mr Robinson (and which is still being collected) surpasses anything of the sort which has ever been known before Not the least interesting feature of all the new discoveries is the abundant confirmation which they provide of the conclusions drawn by the South African scientists from their study of the first remains of the Australopithecine which were found quite a number of years ago Whether these ape-like creatures can be properly termed "missing links" depends of course, on how this term is understood At least it can hardly be doubted particularly with all the new evidence which has been recently accumulated that they come much nearer to the popular conception of a "missing link" than anything else so far discovered

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"pro convertin" After the first part of the session, which was severely technical, the second part was devoted to hæmophilia

Dr R G MACFARLANE said that though it is reasonably certain that the clotting defect in hæmophilia is due to deficiency or inhibition of a plasma factor, we still do not know what it is—apart from its connection with the globulin fraction He therefore avoided the use of terms like thromboplastinogen as too precise Compared with normal blood, hæmophilic blood is less sensitive to the action of thromboplastin, the insensitivity can be corrected by the addition of normal plasma, which presumably contains the thromboplastin co factor, this co factor is particularly important when thrombo plastin levels are low, as they are in normal clotting There is evidence, too, that the deficiency of this globulin factor is accentuated by a defect in the albumin fraction of hæmophilic blood He also pointed out that in whole blood clotting, as distinct from artificial mixtures of "factors," thrombin is rapidly destroyed, and that normally thrombin formation keeps ahead of destruction, but in hæmophilia the rate of thrombin formation is slow and does not keep ahead of destruction, so the blood appears unusually stable

Dr P D FEISSLY (Switzerland) emphasised the platelet abnormalities, and Dr A FIEHRER (France) discussed the abnormal albumin in hæmophilia

Dr K M BRINKHOUS (U S A) described a most interesting hæmorrhagic disease seen in a breed of setter dogs It has now been studied for 4 years and resembles human hæmophilia very closely The mode of inheritance, as tested by breeding experiments, is the same By mating an affected male with a proved female carrier, affected females were obtained—as theory required Attempts to breed from these females failed because there was always intra uterine hæmorrhage The clinical picture is like that of human hæmophilia, with hæmarthroses and large subcutaneous hæmorrhages prominent, and the abnormalities of blood clotting are precisely the same as in human hæmophilia The blood of the known transmitter females has been carefully examined, but no abnormality or indication of the trans mitter state has been found Further work on these animals is projected, but they are not easy to keep alive

Dr V BIANCHI (Italy) startled his audience by stating that it is possible to keep the blood of a hæmophilic person normal by injecting 3 ml. of fresh human plasma daily Dr C MERSKEY (South Africa) described the re examination of two female "bleeders" from a hæmophilic family in which there had been a first-cousin marriage The plasma of these women would *not* correct the slow clotting of known hæmophilic blood, and it was concluded that they were true hæmophiliacs

In the discussion, Dr Bianchi's methods were destructively criticised and it was stated that at least 50 ml. of fresh human plasma is needed to correct the clotting defect of hæmophilic blood for 3 days, and the effects of 10 ml. pass off in 8 hours Dr VAN CREVELD (Holland) showed that lyophilised heparin plasma gives better preservation of the anti hæmophilic globulin than citrated plasma. Professor OWREN thought that studies of the pro accelerin factor in the blood of female transmitters in hæmophilia did show abnormalities

PURPURA

Prof A FONIO (Switzerland) gave a high speed account of the physiology and pathology of blood platelets, and Dr F KOLLER (Switzerland) showed two cases of purpura fulminans in scarlet fever that he attributed to factor V deficiency Dr E L LOZNER (U S.A) spoke about the difficulties in treating primary thrombocytopenic purpura There are some patients who do not respond to splenectomy, and some whose platelet level falls after a post splenectomy rise. He noted that over the age of 15 there are nearly four times as many females as males, and also that babies from mothers who have had splenectomy may be thrombopenic Thrombocytopenic purpura is often associated with puberty, menstruation, and pregnancy, and in both man and animals œstrogens have been reported to produce thrombopenia All this suggested that there is an œstrogenic element in thrombocytopenia, and Dr. Lozner stated that A C T H has produced a remission in thrombocytopenic purpura, possibly by inhibiting œstrogen

Dr H N ROBSON had observed capillary function in patients receiving A C T H treatment and found an increase in capillary resistance to rupture by negative pressure

EXPERIMENTAL LEUKÆMIAS

Dr J BICHEL (Denmark) presented results with tissue cultures which in his opinion showed that such prepara tions are of little use for differentiating between different cells in leukæmias Dr U HAENEL (Switzerland) had given folic acid antagonists and benzimidazole—which reduces the white cell count in chronic myeloid leukæmia—to patients and had studied the cells in the marrow by staining with pyronin at pH 4 9 He thought that these substances work by interfering with ribo nucleic acid formation and by blocking mitosis in metaphase Dr W JACOBSON, however, produced evidence that folic acid antagonists do not do either of these things He interpreted his results as showing that they prevent the shedding of ribonucleic acid from the chromosomes in telophase

BLOOD GROUPS

The final day was dominated by the immunohæmatologists, whose papers were often for the expert only

Dr J VAN LOGHEM (Holland) discussed the relative importance of the twenty nine known blood factors and some points in the organisation of transfusion services Dr A E MOURANT, dealing with blood transfusion services in non European countries, suggested that the money needed for setting up all the facilities for catching the odd Rh incompatibility might well be better devoted to other health purposes such as the control of malaria and hookworm, this applied especially to Asia

Dr A S WIENER (U S A) gave a spirited account of the application of Rh-Hr blood tests to disputed paternity cases and to sorting out inadvertently mixed twins The correctness of his conclusions was, he said, usually confirmed by the repentant mothers, and so evidence for the support of his theory of Rh Hr inheritance was obtained He pointed out that in New York, by using ABO, MN, and Rh Hr tests, a man stood a 50% chance of being proved not the father when wrong fully accused and apparently the courts can order—and appreciate the value of—blood tests

Dr P MOUREAU (Belgium) gave a bilingual account of a man proved innocent by the group tests, including the "S" factor Dr R SANGER described the blood of a person of unimpeachable pedigree, with a second cousin marriage at an important point, who had no detectable representative of the C or E series of allelo morphic antigens in her serum her group was therefore -D / D All her children had been either stillborn or erythroblastic Both Dr WIENER and the supporters of Fisher's theory maintained that this occurrence provided firm proof of the correctness of their respective ideas on the inheritance of Rh subgroups

* * *

In conveniently placed rooms there was an exhibition of books apparatus, and commercial products, and some demonstrations among which Dr S MOESCHLIN's set of colour photograph transparencies from spleen puncture material was particularly good The high spot was the demonstration of rival red-cell-counting machines, whose

production of cells with a normal life span Also using N^{15}, it has been found that 10–15% of the bile pigment excreted in the fæces comes from sources other than circulating red cells, in pernicious anæmia the figure is 40%, and in a patient with congenital porphyria whose red cells had a normal life span the figure was 30% The sources of this pigment are not clear, but hæm not bound to globin may be one of them

HYPERSPLENISM

Dr T S EVANS (U S.A) showed that in giant follicle lymphoma the anæmia can be attributed to splenic overactivity, as the condition is relatively benign, splenectomy for the relief of the anæmia is a logical step and all his three patients so treated did well Dr P S HAGEN (U S.A) held that the anæmia in leukæmia is hæmolytic and can be attributed to hypersplenism Eight patients, in whom the anæmia rather than the leukæmia was the important disability, were treated by splenectomy, they were not cured, but their need for supporting blood-transfusions was sharply reduced The Coombs test was positive in only one case and remained positive after splenectomy

Dr R O M BERLIN (Sweden) put the matter on a scientific basis by showing that the survival of the red cells in these patients is much reduced (to 35 days or less), the reduction runs roughly parallel with the degree of splenomegaly After splenectomy, the survival-times of the red cells were much prolonged Again, the patients were not cured, but transfusions were needed only infrequently The presence of blast cells was an absolute contra indication to splenectomy

Dr KISSMEYER NIELSEN (Denmark) had found that ligating the splenic vein in rabbits permanently reduces the granular white cells in the blood but has no other lasting effect, the marrow in particular was unaffected The animals so treated did not show the anæmia, granulocytopenia, and thrombopenia that toxic effects such as infection with tubercle bacilli produce in the normal animal The results suggested that the spleen acted on the peripheral blood rather than distantly on the bone marrow

At the end of a long session Dr W DAMESHEK (U S.A), the chairman, announced that he had seen no good results in eighteen splenectomies done for leukæmia, and he feared that the discussion had confirmed his growing opinion that hypersplenism was a romantic subject devoid of scientific truth.

HÆMOLYTIC ANÆMIAS

Dr DAMESHEK explained his theory that the factor common to symptomatic and idiopathic hæmolytic anæmias is the presence of abnormal antibodies in the plasma Modern techniques, like the use of albumin solutions and the Coombs test, have helped to detect these antibodies in an increasing proportion of patients He outlined a theoretical scheme to explain how the hæmolysis occurs and concluded that for treatment there are four lines of approach (1) to check antibody formation, (2) to neutralise antibody, (3) to modify the red cell membrane, and (4) to remove the spleen Only the first and last are practicable at present To stop antibody production, nitrogen mustard has been used, but a response was obtained in only one out of four patients Splenectomy was performed because the spleen is the destroyer of spherocytes—i e, red cells affected by hæmolysins, Dr Dameshek thought little of the idea that the spleen inhibits erythropoiesis in the marrow Splenectomy is not, however, a complete answer, of forty six patients so treated, full recovery occurred in twenty one only Experience with leukæmia, even when autohæmolysins were present, was uniformly unfavourable ACTH has been tried, since it is said to influence antibody formation, but the results were [illegible]

Dr E WITEBSKY (U S A) recommended a mixture of normal serum and 30% serum albumin for detecting antibodies and pointed out that patients with acquired hæmolytic anæmia often develop unusual antibodies against Rh antigens Dr W H CROSBY (U S A) showed that in paroxysmal nocturnal hæmoglobinuria the plasma contains a heat labile factor that hæmolyses the defective red cells only when it has been activated by thrombin The blood clotting factor "plasma Ac globulin" is similarly activated to "serum Ac globulin" (factor VI) by thrombin, so possibly the clotting and hæmolytic factors are identical If so, it might be rational to prevent hæmolysis by using anticoagulants Dicoumarol did, in fact, diminish hæmolytic activity temporarily, but whenever it was stopped a hæmolytic crisis followed

HODGKIN'S DISEASE AND LEUKÆMIAS

Dr S MOESCHLIN (Switzerland) argued that Hodgkin's disease should be treated like a neoplasm by extirpation of the primary focus followed by application of X rays and nitrogen mustard, he had three patients treated this way who had lived 5–10 years without relapse

In leukæmia Dr J M STICKNEY (U S.A) had used up to 200 mg of ACTH and 300 mg of 'Cortisone' daily for adults, and 50–70% of these doses for children, courses of 20–30 daily doses were given The excretion of 17 ketosteroids was used to check the activity of the material used, ACTH increasing and cortisone decreasing the excretion The usual side effects were seen, but no mental troubles Of eighteen patients with acute leukæmias, two had complete remissions but were now leukæmic, the other sixteen had died At necropsy focal areas of necrosis were found in the marrow with islands of leukæmic cells, elsewhere erythropoiesis was active, the usual leukæmic infiltration of liver and kidneys was present and unaffected In chronic lymphatic leukæmia, 2 g of cortisone caused shrinkage of liver, spleen, and lymph glands, but the blood and bone marrow remained leukæmic In three cases of Hodgkin's disease results were poor The best remission, lasting 16 weeks, occurred in an adult of 31 with myeloblastic leukæmia, but he died 10 weeks later when a second course had no effect This resistance to second courses was lamentably frequent

Dr DAMESHEK reported results in twenty five cases of leukæmia and five of lymphosarcoma with similarly disappointing results As much as 60–80 mg of ACTH was needed daily, remissions were seen only in children, and then the side effects were serious and disfiguring In two patients with myeloma, 40 mg of ACTH daily stopped pain and reduced the hyperglobulinæmia for 5 months On the whole, Dr Dameshek considered that ACTH is *not* of practical therapeutic value in leukæmias Dr VIDEBAEK (Denmark) had five similar cases

In the discussion Dr WEISSBECKER confirmed the uselessness of ACTH in Hodgkin's disease, Dr SUZMAN (South Africa) pointed out that ACTH may light up dormant tuberculous foci, Dr HOOGSTRATEN had eight patients, Dr SHIMKIN (U S.A) ten patients, and Dr SEPSON three—all with poor results Finally, Dr L FOURMAN pointed out that injected ACTH is rapidly destroyed and excreted and should therefore be given in small divided doses, not daily The session closed with better therapeutic results reported by Dr E E OSGOOD (U S A) with total body irradiation by X rays or P^{32}, by Dr J H BURCHENAL (U S A) with folic acid antagonists including 2, 6 diaminopurine, and by Dr P BJERRE HANSEN (Denmark) with urethane

CLOTTING OF BLOOD

During a field day for the coagulationists, the uninitiated learnt with horror that more new, or renamed, "factors" are on the way, like "pro accelerin" and

the characteristics of Cushing's syndrome For the syndrome he had described Professor Zondek suggested the name 'diencephalopathia vascularis"

STREPTOMYCIN

In a paper submitted to members of the congress ETIENNE BERNARD and B KREIS (Paris) discussed the development of resistance to streptomycin In a small series of cases they had shown that heavy dosage (2–5 g) hastened the appearance of resistance They had observed, too, 'dissociated" resistance in the same patient according to the lesions from which the organisms were obtained. They had also confirmed the rarity of resistant organisms in meningitis treated even for long periods with streptomycin, and they had found the same, though to a lesser degree, in miliary tuberculosis On the other hand, with cavitation or with purulent effusions, resistance was common, and from this they deduced that the more abundant the organisms in lesions, the more readily would resistance develop Not all lesions due to sensitive organisms were cured by streptomycin Perhaps this was due to too low a concentration, or to local inactivation, of the antibiotic, but the main factor was probably the structure of the lesion or inadequacy of the patient's defence mechanism No undoubted aggravation of the disease had been seen to follow streptomycin treatment For the patient the real danger of streptomycin resistance was that he would eventually be deprived of an irreplaceable weapon for society the risk was that as infections with resistant organisms spread, the benefits of this great advance would gradually recede to vanishing-point

R DUBOIS MANNE (Brussels) urged that tuberculous meningitis should now be regarded as curable, since 31% of patients survived after streptomycin treatment had been discontinued for a year K TODOROVITCH (Belgrade) held that in tuberculous meningitis streptomycin was of the greatest value when given in moderate doses by combined intramuscular, lumbar, and cisternal injections JEAN TAPIE (Toulouse) underlined the importance of early and prolonged treatment by intramuscular and intrathecal injection, the latter being indispensable in the acute stage In practice the risk of resistance need hardly be considered when the response was unsatisfactory it was more important to seek a pathological cause such as spinal block or calcified tuberculoma The prognosis, except where the response was immediate, depended on the extent of caseation and on whether or not basal exudate interrupted the C.S.F circulation

SOME FURTHER TOPICS

Radioactive substances—RENE FAUVERT and ANDRE LOVERDO (Paris) had investigated the movements of the sodium ion in health and disease A mathematical study of the diffusion-curves for Na^{24} injected into the blood-stream showed that it was possible to distinguish four phases in ionic diffusion, characterised by four distinct exponential curves These data had been used in studying the rate of diffusion through the capillary walls and in measuring the volume of extracellular space in normal and pathological states

Alcoholic cirrhosis—RENE CACHERA MICHEL LAMOTTE, and SUZANNE LAMOTTE-BARRILLON (Paris) had recorded by repeated biopsies the histological state of the liver in 82 alcoholics. Fatty infiltration sometimes massive, was the dominant histological finding in alcoholic cirrhosis without clinical signs Liver-function tests in these cases usually gave normal results. A further and more detailed study on 40 alcoholics had shown that the evolution of the liver changes was very variable It was possible for massive infiltration to disappear the factors aiding this process were abstention from alcohol, attention to diet and administration of lipotropic substances The liver condition was an overdeposition of fat and not a fatty degeneration In chronic alcoholism, as in experimental fatty infiltration, the eventual cause was probably a deficiency of lipotropic factors, but this might not be the whole explanation, for in some cases of cirrhosis there was neither undernutrition nor alimentary disorder The endocrine system, which was known to be affected in chronic alcoholism, might play a part in mobilising reserves of tissue fat, which was then transferred to the liver

Postabortional anuria—PASTEUR VALLERY-RADOT, PAUL MILLIEZ, CLAUDE LAROCHE and LOUIS MOREAU (Paris) remarked that the clinical picture of postabortional anuria was always the same, whatever the causative organism or toxin The critical period was between the 8th and 20th days If the patient survived long enough for regeneration of the tubular epithelium to take place, recovery was complete, and renal function returned fully to normal in 6–12 months Histological studies showed that the glomeruli and the afferent and efferent vessels were unharmed but were empty of blood, and the tubular changes were not generalised, especially in the early days These tubular lesions did not account for the whole picture The persistent albuminuria, and the absence of blood in the glomeruli and in the afferent and efferent vessels, seemed to point to vascular spasm The resulting renal anoxia was perhaps the cause of the tubular lesions and of the acidity of the urine, which favoured the precipitation of destroyed hæmoglobin in the kidney

Relation between tuberculous infection and tuberculous disease—J HEIMBECK (Oslo) who had observed 9000 Norwegian subjects for an average of 11 years, held that morbidity and mortality were much higher when the primary tuberculous infection was massive and long-continued than when it was small and brief. Morbidity was also increased by superinfection

Arteriovenous anastomosis in the treatment of obliterative arteritis and of hypertension—C LIAN and H WELTI (Paris) had developed a technique of lateral anastomosis between the femoral artery and vein, followed by ligation of the vein at its proximal end, in the treatment of obliterative arteritis of the lower extremities They suggested a trial of this technique, though without ligation of the femoral vein, in arterial hypertension with a high diastolic pressure

Coagulation-time—A new method of measuring blood coagulation time was described by ANDERS KRISTENSON (Stockholm) This method was based on changes in the viscosity of blood placed in a rectangular vessel in which was suspended a pendulum The resulting changes in the swing of the pendulum were recorded photographically on a moving film and thus a coagulation 'profile' could be obtained. This profile was different in the normal and in certain pathological conditions

Sheep-cell agglutination test—In collaboration with KARL SCHLOSSMAN, NANNA SVARTZ (Stockholm) had modified this test the essential feature being that all agglutinins against normal sheep cells were absorbed before the test with sensitised sheep cells was carried out Sheep-cell agglutination with a high titre had been demonstrated in about 90% of cases of rheumatoid arthritis, and the test was only rarely positive in other diseases Neither A.C.T.H. nor cortisone had any effect on this reaction.

REPORTS

The programme included, as well as medical films and clinical demonstrations, nearly two hundred different papers These have appeared, in whole or in summary, in the *British Medical Journal* (Sept 9), the *Semaine des Hôpitaux* (Aug 30 Sept 2, 6, and 10), the *Schweizerische medizinische Wochenschrift* (Sept 9), and a special issue of *Acta Medica Scandinavica*

extraordinary complexity was hidden under smooth façades As these instruments cost about £500 apiece, they are unlikely to be popular just yet, and they are in fact still experimental

* * *

When, after five days of almost continuous talking, the exhausted delegates separated, they must all have felt that it had been a very useful conference, and were correspondingly grateful to Sir Lionel Whitby and Dr Martin Hynes and their staff who had done most of the organisation Their satisfaction was tempered by regret that few are likely to surmount the obstacles in the way of reaching Buenos Aires for the next conference to be held in 1952

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE

IN medicine holism is often praised but seldom practised, and the courage of those who sponsored this congress, dedicated to the whole vast field of internal medicine, was highlighted by the international congresses on cardiology and psychiatry which preceded and followed it in the same capital—Paris

The International Society of Internal Medicine was brought into being at a meeting attended by representatives of 19 nations at Basle on Sept 27, 1948 The initiative came largely from Prof Nanna Svartz, of Stockholm, and Prof A Gigon, of Basle itself No doubt the founders were encouraged by the success of conferences on internal medicine held from time to time in Switzerland with visitors from one or other of the countries of Europe, and Professor Gigon will be warmly remembered for his part in the profitable British Swiss conference of 1946 But what of a world conference, where neither subjects nor speakers could be so assiduously preselected ?

In the event the enterprise succeeded Some 1000 doctors from 46 nations were present at the Paris congress, from Sept 11 to 14 The defects were those common to most international meetings of this sort Not all the papers maintained the prevalent high standard, not all the speakers put in an appearance, the agenda was somewhat over full, speakers often insisted in cramming an hour's speech into their allotted minutes, and the language bar was often evident When the second congress is held in London in 1952 it might be well—supposing that the official languages remain English and French—to arrange for simultaneous translation, delivered through earphones, into the second language—an arrangement which proved highly satisfactory at the 1946 Basle conference Alternatively, a brief summary could be given in the second language after each speech, printed summaries, even when available, are not always informative This device proved effective at last year's meeting of the International Hospital Federation, though few could match the skill and tact then shown by Prof René Sand in reducing speeches to manageable proportions

PRESIDENTIAL ADDRESS

In his address at the opening of the conference, Prof A LEMIERRE, the president, recalled that the last world congress on internal medicine held in Paris—this was in 1900—was attended by Rudolf Virchow and Ivan Pavlov None could doubt the need for the specialisation which had since become more and more evident, but few would applaud the ever firmer division between the growing number of specialties To this day the tradition in France was that those who were to have charge of hospital beds must first gain a thorough grasp of all branches of medical pathology, thereafter it was time enough for them to turn to the specialty of their choice Furthermore, in France accession to a chair in a clinical specialty was often preceded by temporary occupation of a chair in a general subject

ENDOCRINOLOGY

Adrenocortical function—JOHN R MOTE (Chicago) contributed a film illustrating dramatically the effect of adrenocorticotropic hormone (A C T H) on the general and local condition in a case of burns The film showed a man with severe burns involving 70% of the body, with extensive exposure of muscle With A C T H treatment pain was absent, there was no œdema, no fever, no disturbance of the electrolyte balance, and no anæmia at any stage, and the wound did not become infected At the tenth day the patient walked without discomfort Pinch grafts applied at the 41st day took, with one exception, and epithelisation was quickly completed Earlier, Dr Mote had suggested that features of the action of A C T H were that it inhibited pain and fever In all diseases where A C T H or 'Cortisone' were effective these substances were, he suggested, preventing damage to cells, cells were "immunised against their environment" By stimulation of the adrenal cortex it was possible for general peritonitis to be present without symptoms or signs, and similarly poisoning by snake or spider gave rise to no symptoms

J M CARLISLE (New Jersey), speaking on the clinical uses of cortisone, emphasised the need for a rigid schedule of dosage, with gradual withdrawal Cortisone was effective when given by mouth, but it should be administered first by injection, reserving the oral route for maintenance doses Cortisone must be of the proper particle size, and some of the earlier work, undertaken with large particle cortisone, should be repeated using the better small particle substance This should be kept at room temperature, below which it might deteriorate through formation of larger particles Cortisone should be used with respect, in rheumatoid arthritis close attention should be given to diet, orthopædic measures, and a proper balance of rest and exercise Lately it had been used in toxæmia of pregnancy and in subdeltoid bursitis

Among the papers on the action of cortisone and A C T H was one by B OLHAGEN (Stockholm), who had found by electrophoretic analysis that in various diseases, and especially in rheumatoid arthritis, these substances evoked profound changes in the plasma components, with a general decrease of protein and a return towards a normal pattern When treatment was discontinued changes in globulin reappeared before any other indication of relapse

Deoxycortone—RÖLF LUFT and BJÖRN SJÖGREN (Stockholm) had found that in healthy subjects the administration of 20 mg deoxycortone acetate and 10 g sodium chloride daily caused a mean increase in blood pressure of 15 mm systolic and 10 mm diastolic, this increase was statistically significant In hypotensive subjects the effect was the same, and postural hypotension had been successfully treated with deoxycortone in pellets In the kidney deoxycortone produced an increased glomerular filtration rate but no change in renal blood flow

Vascular changes in pituitary diencephalic lesions—H ZONDEK (Israel) had observed in many patients of "pituitary" type minor vascular changes consisting in either vasoconstriction or vasodilatation, and clinically manifested by collapse, epileptiform attacks, migraine, anginal attacks, or angiospasm in the extremities, in one case there had been repeated intestinal hæmorrhage In no case was the blood pressure increased, nor was there any evidence of arteriosclerosis No case showed

Letters to the Editor

TUBERCULOSIS

SIR,—The means of treating tuberculosis successfully have in many respects improved during the past few years Favourable factors include

1 The gradual improvement of housing in many areas and the quicker supply of suitable shelters in which patients can be accommodated at home
2 The advent of chemotherapy and antibiotics
3 The easier practice of some active measures such as phrenic crush and artificial pneumoperitoneum
4 The wider use of portable equipment

Moreover general practitioners are more aware of early symptoms of the disease, and young doctors have been better instructed about diseases of the chest

The present emergency is only partly due to the shortage of nurses and domestic staff in sanatoria, and it could be overcome if chest physicians were enabled to make full use of the other resources now at our disposal The value and practicability of domiciliary treatment in a large proportion of cases is now clear Where a patient, after a period of bed rest at home, seems likely to benefit from more active treatment such as phrenic crush or artificial pneumoperitoneum, this is feasible with a little organisation Apart from the surgeons in the chest units, many surgeons in general hospitals are now willing to perform a phrenic crush as outpatient treatment, if they can rely on proper aftercare by the chest physician the plan is already working well in some areas, and could be put into practice on a far larger scale Artificial pneumo peritoneum can easily be induced under radiological control at the chest clinic, and can be continued by refills given in the patient's home Now that these less hazardous methods are available, artificial pneumothorax, for which, ideally, the patient should be admitted to hospital or sanatorium, is less often required as the initial therapeutic approach

But proper domiciliary treatment is impossible without proper equipment and enough health visitors and medical assistants Those who, like myself, have visited clinics in several counties know that at present many are unfit to undertake active treatment on any large scale Many still lack X ray facilities and so cannot carry out refills, they depend on the already overburdened radiological department of a nearby hospital, which is continually pleading for fewer requests for radiographic examinations In some regions it is impossible to arrange for tomograms within a 30 mile radius these and other special radio logical investigations may take anything up to four months to get done Where there are X ray plants, it often happens that the frame cannot be tipped or turned, which means that investigations with the patient in a recumbent or other unusual position simply cannot be made I cannot help thinking that it would be more profitable to attach mass radiography units to clinics which lack X-ray plants, and use them for the examination of patients referred to the chest physician on medical grounds, than to employ them in the detection of disease in symptomless industrial workers

Bronchography is carried out in but a few chest clinics. A large number of clinics have no proper aspiration sets, and many do not even possess a two way or three way syringe—not even a three way tap and adaptors, though these can be obtained for a few shillings As a result, the chest physician suddenly called on to aspirate pleural fluid has to undertake all kinds of manipulations to avoid letting air into the pleural space Another vital tool more often absent than not is a tension pneumothorax set In one clinic I have seen, there are no X ray facilities (and therefore no refill sessions), no sphygmomanometer (and therefore no blood pressure readings), no aspiration set, and no syringes or needles for taking blood, more over the examination couch is in a lamentable condition Clinics such as these cannot be justified in the light of modern requirements

If a final breakdown of the tuberculosis service is to be avoided, the only possible policy is to bring the chest clinics up to standard, equip them with the tools needed, and staff them with personnel who know how to use them The tuberculosis death-rate of nearly 400 per week is serious enough, but it is far more serious that thousands of living tuberculous patients should be lingering about, gradually deteriorating, and desperately awaiting some move towards their cure Now is the time for the chest physician to initiate treatment in the patient's home whenever possible, just as any modern practitioner facing a patient with cardiac failure would not hesitate to administer digitalis or a diuretic almost at once Chemotherapy, antibiotics, phrenic crush, and artificial pneumoperitoneum have been given to us as very helpful weapons in domiciliary treatment, which if intelligently applied can produce most gratifying results

M D

TOBACCO AND LUNG CANCER

SIR,—The leading article under this heading in your issue of Aug 12 suggests some comments

1 The investigation of Passey and Holmes,[1] published 22 years ago, is brought forward once again to support the view that we do not know whether any real increase in cancer of the lung is occurring at the present time J A Heady and the writer[2] have suggested that anyone arguing thus "is placing upon the material of Passey and Holmes a significance which it is not fitted to bear For many years some students of this subject have wondered whether the (alleged) absence of any evidence in their data of an increase in cancer of the lung was not due to the fact that the great bulk of this increase took place after the period studied by Passey and Holmes " Between the last year of that period (1928) and the latest for which figures are obtainable (1948), the deaths attributed annually to cancer of the lung in England and Wales rose 10 4 fold in men (814 to 8500) and 5 6 fold in women (314 to 1755) Whatever may be thought of the reality of this increase the question can hardly be settled by data obtained before it began, the changes stated in the article in question to have occurred in other countries are surely irrelevant

2 Your article states that "Kennaway and Kennaway[3] assessed the apparent increase in this country (on which all authorities agree) and concluded that it is probably real—at least in part" The paper in question collects evidence from which the reader might form his own opinion, but this conclusion is not drawn

3 The leading article selects for especial emphasis the cancer of the lung in the miners of the Erzgebirge, and in asbestos workers If any enumeration of indus trial forms of lung cancer is being attempted, the latest collection of data from the chromate industry[4] should be mentioned.

All workers in cancer research will hope that Professor Dungal, whose article also appeared on Aug 12, will give us more data from his very valuable material. The standard of living, and especially of nutrition, in Iceland is high, and the factors of social stratification, industrial ism, and atmospheric pollution are quite different from those in many of the countries from which our statistics of cancer are drawn

Pathological Department,
St. Bartholomew's Hospital
London E C 1

E L KENNAWAY

SIR,—Professor Dungal's observations, in his interesting article of Aug 12, on the relationship between

1 Passey R D Holmes J M. *Quart J Med* 1935 4 321
2 Heady J A, Kennaway E L *Brit. J Cancer* 1949 3 311.
3 Kennaway E L Kennaway N M *Ibid* 1947 1 260
4 Machle W Gregorius F *Publ Hlth Rep Wash* 1948 63 1114

In England Now

A Running Commentary by Peripatetic Correspondents

"I find it hard to believe that these scientific folk reading papers at this World Congress of ——ology are world leaders in their specialty and clever men Most of them are pathetically inefficient at what they are at present doing They come here to 'sell their goods,' their ideas and results, to their fellow ——ologists, but they don't do it" So spoke a bright young thing, attending on an obscure special job She had previously floated about the borders of film and radio work in the section of "clarity-production" She went on "The great majority of English speakers are inaudible to four-fifths of their audience They imagine they are speaking to the audience, but they should be talking into the mike Watch the audience After two minutes they begin to look about, to make pretence of reading a programme, to pull out a book Why don't the speakers rehearse and again rehearse, like an invited radio speaker, and why don't the authorities tell every speaker to SPEAK TO THE MIKE? As for the subject matter for their slides of course I didn't understand any of it, but even I could see that sometimes they had two dozen statements on one slide Think of the silent films An average audience takes nearly a minute to grasp one fact put on the screen in eight words To present complicated slides on the screen should be a penal offence And as for the foreigners talking English! No man ought to dare to give a paper in a foreign tongue unless he grew up with that tongue, and is so expert that he could join a Secret Service and go to a foreign country expecting to be taken for a native Surely your authorities could provide the foreigner with a prominent seat on the platform while a trained announcer reads his paper for him And couldn't the authorities make certain the hall is in almost complete darkness for a minute when a slide is being shown The speaker's reading light should be a glimmer And another thing 'Who is speaking?' I heard that question at the back of the hall at least a dozen times Surely every speaker's name and country should be written large and plain on a blackboard?"

Fortunately I am trained to quick action in emergency My instant invitation to a drink successfully dammed the flow

* * *

It seems that more volunteers are needed for Eilean nan Ron, the little Scottish island where a common-cold research project is in progress, for this notice has appeared in the Medical School

"Any student who wishes to participate in this research, and who also would like a holiday in a remote island with a cold in the head, should hand in his name to the secretary, Department of Mental Health"

* * *

At the symposium on formularies during the British Pharmaceutical Congress in Glasgow, it was interesting to hear the frank and well-informed criticism of some of our prescription writing, and of the main reason of its failings—namely, the dominance in medical schools of pathology and diagnosis over therapy One medical teacher was said to have held that students need not know the doses of drugs Enough that mixtures should be compounded by the pharmacist so that one unit gave a weak and two units a strong dose! Economical patients receiving 16 oz of a preparation with a dose of 1 drachm are apt to pass on the unused portion to a friend, and one speaker said it was a commonplace in his profession that the Fleet could be floated on wasted medicine Another pointed out the menace of the domestic teaspoon as a measure, especially with children, and he also deplored the common use of even more erratic measures due, he said, to our failure to inform patients of the need for accuracy The public took a rap or two as well, for the habit some have of drinking out of the bottle, and for their belief that if a spoonful three times a day is good, two spoonfuls six times a day is four times as good, or even better Unimaginative prescribing of nauseous draughts for children was also criticised Why did we not make more use of black currant and rose-hip syrups? Why not indeed? Then the discussion touched lightly on *mist diabolica*, used, you will recall, to discourage the hypochondriac medicine addict Some patients joyfully came back for more, for it was the "strongest stuff I've ever had" This I can confirm, even though our hospital's version was mainly asafœtida and valerian flavoured with a little paraldehyde

On me the discussion had a tonic effect, and I realised as never before what good allies we have in the pharmacists

* * *

Holidays abroad have brought home to me the important part played in any language by the meaningless phrases we employ automatically in our mother-tongue about such topics as the weather My command of German is adequate, but such remarks as "Mahlzeit!" from the waitress or "Viel Vergnugen!" from the Gasthof proprietor always catch me, linguistically, on the wrong foot "Danke schön!" soon becomes monotonous as a rejoinder, and while I am groping after eloquence the opportunity passes, leaving yet another foreigner convinced of stony British reserve and disillusioned as to the practicability of Western Union

But how blissful, how restful to be in Yugoslavia where I can't speak a word of the language No ruminating over half-understood phrases, while the next few sentences slip past, none of those repeated interjections of the local equivalent for "Yes," uttered with what one hopes is an expression of lively intelligence Instead, a fatuous grin and the self explanatory designation "Engleski" melt the hearts even of customs officials and invariably call forth kindness and solicitude as for the mentally afflicted Unfortunately, they also at times call forth one of those busybodies who profess to talk foreign languages, but if I stick to English I am usually able to discourage them in the end

And the children seem remarkably quiet and well-behaved Perhaps even the Yugoslavs draw the line at offspring who answer back in Serbo Croat

* * *

In the State of New York a medical career of great promise was interrupted last week by a sentence of one year in a county penitentiary For five years the victim had successfully held resident posts in various hospitals along the Eastern seaboard, and everything went smoothly until he fell behind with payment for a car Then the police interfered, and the upshot was the discovery that he had never been to a medical school In retrospect, of course, it is perfectly obvious that this man was no ordinary doctor The *New York Times* of Sept 14 tells us that he is "short, stocky, and suave," with a black moustache and spectacles Well, so are a lot of us, though perhaps fewer are, as one hospital administrator said of him, "very pleasant and impressive" But listen to this He had "an extraordinary knowledge of English *and Latin* medical phrases" What a give away! Then again he had just been serving for four months as senior resident physician "without a single medical error," and the State police were unable to find that he had ever "committed a medical misdeed in numerous operations" What a blunder! There's only one thing for it We must have a controlled investigation in which one half of a hospital staff will be qualified in the old-fashioned way and the other half will be self styled doctors The patients will be the judges The qualified half will get a chance of learning to be "very pleasant and impressive" The rest of us will await the outcome with ill concealed anxiety

* * *

Are we now advertising through the London Transport Executive, or did I dream this (with apologies to *Punch*) in the Tube last night?

Are you thin? Are you fat?—Are your arches all flat?
Does your tummy sag down to your knees?
Has your jaw ever locked? Are your sinuses blocked?
Do you cough, do you sniff, do you sneeze?
Have you neurotic pains—or bad varicose veins?
Has your pulmonary valve sprung a leak?
Do you suffer from fits? Are your nerves all to bits?
Try a page of *The Lancet* each week

As long as the present system of teaching by specialties (however modified by psychiatricosocial projects) continues there is always a certain implication that the G P s are the specialists' throw outs—the boys who could not make the grade in the higher examinations I feel that there is only one satisfactory solution to the problem of how to make a G P successfully—let G P s of experience train him Let this be the mainstay of his training, and let the specialties be the titbits thrown in—not the other way round Thereby the student may learn early in his career the amazing things that can be done with no other apparatus than a stethoscope and a book of prescriptions, and Cinderella may at last have a chance of her date with Prince Charming

It is surely good that the idea of "trainee assistants" has begun to creep abroad Why not "trainee students" as well? This would be of mutual benefit, for it would give the G P the chance of one of the things whose lack holds him back most of all—discussion of his patients with a second person

What a long trail lies before the future G P After 1952, he must learn physics and chemistry and forget them, learn anatomy and physiology and forget them, learn the specialties and forget most of them, learn something useful as an intern, and serve in the Forces and forget everything, by which time he is eligible to become a trainee assistant

Manchester KENNETH D HOPKIRK

TRANSVESICAL PROSTATECTOMY

SIR,—The technique of transvesical prostatectomy described by Mr Crawford Stanley in your issue of Aug 5 is very similar to my own, and I have found this very successful

I can endorse everything Mr Stanley says about this simple approach The operation, as he claims, can be easily performed without any special instruments, and the surgeon can easily attend to any associated pathological condition in the cavity of the bladder

My technique differs somewhat from that of Mr Stanley

In the first place, I prefer to put my patients on a course of streptomycin for three days before operation, and to continue this for a similar period postoperatively

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Again, there is an answer to the question "What has the community done to decry, depreciate, and demoralise" the general practitioner, considered as "adviser and counsellor in matters often far removed from what is taught in hospitals but close to human health and happiness" ? Indeed, there are three answers Dr Dicks himself is better qualified to say what element of mob psychology created an avid public for Dr Cronin's *The Citadel* I will only point out to him that in addition to a number of doctors who were charlatans there was a public eager, for its own psychological ends, to believe they were all charlatans The other side of the same penny is a worship of experts by the pseudoscientific inhabitants of a scientific age The third answer is that over the last twelve years we have been unable to do our proper job for lack of time When I was first in general practice, and people brought to me family problems that fifty years earlier they would have taken to the vicar, I had the time to do my best with them During the war I could not do it There were too many patients per doctor, too many hours of blackout, too many forms to fill in for the Civil Service, too many difficulties in my own living

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Perhaps the thing that shows best how much job analysis would reveal as within the sphere of general practice is the successful formation of a mothers' club, based on the special baby sessions in my practice Its membership is nearly 70% of the possible It is self-financing, self serving, and self organising It offers no inducements "on the side" but exists solely to provide a forum for discussion of the health of mothers and babies from the point of view of maintenance and prophylaxis And it flourishes It has even produced a child in the shape of a fathers' club, which, though much smaller, discusses with animation various conceptions of the ends and methods of education in that broad sense in which "upbringing" is the major part of it

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As long as the present system of teaching by specialties (however modified by psychiatricosocial projects) continues there is always a certain implication that the G.P.s are the specialists' throw outs—the boys who could not make the grade in the higher examinations I feel that there is only one satisfactory solution to the problem of how to make a G P successfully—let G P s of experience train him Let this be the mainstay of his training, and let the specialties be the titbits thrown in—not the other way round Thereby the student may learn early in his career the amazing things that can be done with no other apparatus than a stethoscope and a book of prescriptions, and Cinderella may at last have a chance of her date with Prince Charming

It is surely good that the idea of "trainee assistants" has begun to creep abroad Why not "trainee students" as well? This would be of mutual benefit, for it would give the G P the chance of one of the things whose lack holds him back most of all—discussion of his patients with a second person

What a long trail lies before the future G P After 1952, he must learn physics and chemistry and forget them, learn anatomy and physiology and forget them, learn the specialties and forget most of them, learn something useful as an intern, and serve in the Forces and forget everything, by which time he is eligible to become a trainee assistant

Manchester KENNETH D HOPKIRK

TRANSVESICAL PROSTATECTOMY

SIR,—The technique of transvesical prostatectomy described by Mr Crawford Stanley in your issue of Aug 5 is very similar to my own, and I have found this very successful.

I can endorse everything Mr Stanley says about this simple approach The operation, as he claims, can be easily performed without any special instruments, and the surgeon can easily attend to any associated pathological condition in the cavity of the bladder

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it is important that the medical staff of departments of pathology selected for teaching, in hospitals other than teaching hospitals, should be adequate to allow the senior members time in which to teach all juniors systematically Such an arrangement would, in the end, more than justify the expense of the salaries paid out for little immediate return other than, say, resident alternate night duty required of trainees

When, in the future, conditions become more stabilised it should be possible for the university departments of pathology to be responsible for the initial period of post graduate training and provide, in a two year course, a curriculum similar to that at present followed for one year at the Postgraduate Medical School of London for the university diploma in clinical pathology The additional year would permit of methods being learned less hurriedly and practised more frequently, and at the same time allow of related systematic reading Such university postgraduate courses in pathology for all trainees should not be regarded as the ideal and the unattainable, but rather as the best and an essentially economic means of providing well trained pathologists

Department of Pathology
North Middlesex Hospital London N 18 J F HEGGIE

PAY OF THE PSYCHIATRIC SOCIAL WORKER

SIR,—In your issue of Aug 12, Dr Sessions Hodge describes an advertisement issued by Nottinghamshire county council public health department as "a denigration of the professional standards" of psychiatric social workers I would suggest that, far from affronting that profession, this county council have done it a service by calling attention to its plight

Nottinghamshire offered £370-£20 p a -£530 p.a to duly qualified psychiatric social workers, and to "unqualified persons'—that is, social workers without the mental health certificate—£480-£15 p a -£525—that is to say, the duly authorised officer scale

Thus it seems that the psychiatric social worker is not only inadequately paid but is penalised to the tune of £110 p a for holding an additional qualification for which he or she has been selected on merit and trained for an additional year The gross difference is, of course, in the starting salary The scale for psychiatric social workers was last revised in December, 1946, since when the cost of living has risen by 13 points That it has not been revised since then is not for want of trying

There are now between 80 and 100 vacant posts awaiting qualified psychiatric social workers Further, the number of applicants selected for training does not wholly fill even existing courses, and those who do the selection are concerned that not enough applicants of the right quality are coming forward for this very responsible work Their value is unquestioned, I for one recognise how greatly my own professional contribution depends on that of my psychiatric social worker colleagues

The present salary-scale, agreed between the voluntary hospitals and the medical auxiliaries before the National Health Service started, has been the subject of negotiation through the Whitley Council, and, as your annotation suggests, they have been "unaccountably slow in reaching agreement" To block negotiations by procrastination is to cease to negotiate If there is no intention to move, then it is difficult to see what other course can be taken except to strike But professional people are neither accustomed nor willing, so far, to use the strike as a weapon, and any profession concerned with human welfare and suffering would be loth to withdraw its services in order to force revision of salary-claims, however well this action was justified To be penalised by £110 a year for holding a higher qualification is so patently absurd that in industry it would be met by a threat to strike which would command so much public interest and sympathy that probably the strike would never be necessary In the negotiations which preceded the Appointed Day, the risk that the unwillingness of professional people to strike would be exploited was indignantly repudiated

London W 1 E M CREAK

SIR,—On behalf of the Association of Psychiatric Social Workers I would like to thank you for the consideration you have given to the situation facing our members Apart from the deterrent effect of the present low salary scales on recruitment, to which you and Dr Sessions Hodge refer, there is a very real threat to the professional status of psychiatric social workers Some employing bodies, disregarding the high standard of our professional training, seem to take the view that years of experience in the administration of the Mental Deficiency and Mental Treatment Acts are equivalent to training as a psychiatric social worker On the other hand, there is evidence in other quarters that understanding and appreciation of psychiatric social work has been growing apace—much faster than the present supply of personnel, for there are some 80–100 vacant posts The Nottingham council is by no means the only employing authority faced by the twin evils of a shortage of the trained personnel whom they would wish to employ, and a regulation obliging them to offer a higher salary to less well qualified workers whom they might wish to employ only temporarily The present situation is caught in an administrative tangle, so that the less adequately trained workers in the mental health field have received better treatment in negotiation than ourselves In this situation good will has proved insufficient

A full statement of our case has been made by our representatives on the Whitley Council, and in addition the association has repeatedly submitted memoranda on the professional duties and responsibilities of psychiatric social workers to the Mackintosh Committee, the Ministry of Health, and employing bodies These representations are quite ineffective in face of the present administrative regulation which binds officials in the National Health Service Our only hope now is for a professional and informed public opinion which will act on our behalf We do not press for undue financial advantage in face of the national economic situation, but only for some equitable settlement, so that psychiatric social work may continue to develop its proved values in the mental health field

H E HOWARTH
1 Park Crescent Chairman Association of
London W 1 Psychiatric Social Workers

ESTIMATION OF PROTHROMBIN-TIME

SIR,—In his letter of July 29 Prof A. L Copley (to whom I am most grateful for his distinguished support) confirmed the observation reported in my letter of June 17—that prothrombin time estimations are made irregular by traces of soapless detergents I have also received letters from laboratory workers in this country and abroad confirming my observation, and some of them tell me that they have been aware of the effect by trial and error for several years Others thank me for pointing out a fact which may explain why they have had difficulty with prothrombin time estimations All this shows how important it is that technical details of this type should be published at the first opportunity From the letters I have received, it is clear that at various places in the world a good deal of time and patience have been spent in making the same observation all over again, and in some places where the problem had not been solved prothrombin time estimation has been unreliable and irksome

Pathological Laboratory,
District Hospital,
Pembury Kent. H LEHMANN

and asking for criticisms at the January meeting of the endocrine section of the Royal Society of Medicine

I would, however briefly comment on Dr Medvei's reference to the absence of such coloured striæ in some cases of Cushing's syndrome and their presence in a "normal" young man he briefly describes I would certainly agree with the former as a matter of fact, and have recently had such a case in which an adrenal tumour was removed However, the patient was not really adipose although the limbs had become thinner and the trunk a little fatter I should be somewhat disquieted if lineæ distensæ were present in a case of Cushing's syndrome but were white rather than red or purple, especially if plethora and reddish countenance were present, with or without polycythæmia One would not doubt the diabetogenic potentialities of the adrenal 11 oxysteroids because diabetes was not present in every case of Cushing's syndrome Another condition in which red or purple lineæ distensæ develop is pregnancy—one of the physiological states in which the active phase of rheumatoid arthritis (as observed by Hench) may be temporarily abolished and in which adrenal cortical steroids of the cortisone type are excreted in excess Such lineæ remain after pregnancy, but lose their colour As to the second point, I think Selye would be interested in the development of purple lineæ distensæ during an infection but puzzled by their persistence as coloured lineæ for some years in the absence of an endocrinopathy So am I, but there are, in my view, a number of clinical endocrinopathies not yet elucidated or even described, and I have always taken the view that there are few, if any, endocrinopathies that have not parallel minor indications in "normal" or intermediate states In fact, one of the rewards of the elucidation of major endocrinopathies is the light thrown on the physiology of the endocrine glands In spite of the above considerations, however, I do not regard my views on the significance of coloured lineæ distensæ, as yet, as being substantiated histologically or by hormone assay

London, W 1 S LEONARD SIMPSON

"WEYBRIDGE P P D TUBERCULIN"

SIR,—A footnote to Smith and Vollum's paper of Aug 19, on the Effects of Intrathecal Tuberculin and Streptomycin in Tuberculous Meningitis, states that the purified protein derivative used was the standard preparation supplied by this laboratory Since then we have received numerous requests from hospitals for supplies, and it may save correspondence and telephone queries (either to myself or to Mr Paterson, who is in charge of production) if I make the following points clear

1 The method of preparation of Weybridge P P D tuberculins is described in my article in the *Veterinary Journal* (1946, 102, 267) (There is a printer s error—subsequently corrected—on p 278 where B A I tuberculin was given as 0 22–0 28 mg protein per ml instead of 2 2–2 8 mg)

2 Purified protein derivatives (P P D) from various acid-fast organisms are stocked in dry powder form at Weybridge for research purposes and for use as standards, but for routine purposes neutral solutions are issued at various specified strengths in M/15 phosphate buffer containing 10% glycerol and 0 5% phenol The Weybridge P P D dry powder made from human strain *Mycobacterium tuberculosis* has been tested against Dr Florence Seiberts' limited stock of "pioneer material," on guineapigs sensitised to human strain Potencies are the same, so any medical practitioner who has used her American material for the Mantoux test can compare results with any obtained with Weybridge material on the basis of equivalent weights of P.P D

3 The solution used by Smith and Vollum contained 1 5 mg P.P D per ml This strength is approximately equivalent in potency to the "international standard" held at Hampstead, against which commercial firms standardise their O T by guineapig tests In my original article I gave the potency equivalent of the Hampstead material as 2 mg Weybridge P P D per ml, but subsequent tests have shown 1 5 mg to be rather closer Hence if it is desired to use the same material for the intradermal Mantoux test as for intrathecal injection, dilutions can be based on the assumption that the 1 5 mg per ml solution is equivalent to O T

4 The "standard" solution of P P D mentioned by Smith and Vollum as containing 7 5 microgrammes per ml, to be diluted further 10 fold, 100 fold, or 1000 fold, is obviously made by diluting the original solution (1 5 mg or 1500 μg per ml) 200 fold—presumably with sterile saline

5 At such dilutions a single millilitre phial goes a long way Hence when a request comes through without mention of quantity required, a single phial is automatically despatched as a "complimentary issue for experimental purposes without charge" More is sent if needed

Since current production of human strain P P D at Weybridge would, if all were issued at 1 5 mg per ml (O T potency), amount to over a million millilitres per annum, it is not worth the administrative cost of collecting odd shillings from medical practitioners still at the experimental stage in using P P D The charge to veterinary practitioners is a shilling per millilitre (arbitrarily fixed at the price charged by commercial firms for O T), but for the intradermal test in cattle the material is used neat—not diluted 1000–10,000 times as it would be for the Mantoux intradermal test in the human subject Most of the large output at Weybridge is not actually sold but issued for use by the Ministry's own inspectorate staff in official testing—for the "comparative test," using both mammalian and avian tuberculins, as indicated in my letter to the *British Medical Journal* (1946, 1, 812)

H H GREEN

Biochemical Department Veterinary Laboratory (Ministry of Agriculture and Fisheries), Weybridge

THE PATHOLOGIST'S TRAINING

SIR,—It was with considerable interest that I read of the recommendations of the committee set up by the Royal College of Physicians "to inquire into the training and recognition of medical specialists in pathology, and to make recommendations concerning this branch of medical practice in the future" Having been actively engaged in the teaching of pathology for almost twenty years I write to point out a condition which should apply to all pathologists in training

I consider it imperative that the fundamental principles of pathology should be assimilated and inculcated correctly, systematically, and thoroughly from the very outset, and not be left, as is implied in your annotation (Aug 26) on the report, until the third, fourth, or fifth year when the trainee is in a university or associated department and free from routine responsibilities As a consequence, the recommended generous provision of posts in hospital laboratories, and in the departments of clinical pathology of universities and teaching hospitals, must be such as to permit candidates specially selected for training to be free or relatively free from routine responsibilities in the first, or first and second, years of training This would enable all trainees systematically to acquire within two years considerable competence and experience of laboratory methods in each of the four divisions of pathology, and at the same time to make some study of the four subjects in selected and supervised reading By this means candidates would receive a good grounding in pathology and be the better able to profit from the three succeeding years, in which a selected subject or one of special interest could form the basis of individual investigation and study suitable for presentation as the thesis for a higher degree

This is emphasised because, unless first and second year trainees are appointed *supernumerary* to departmental establishment in hospital laboratories selected for training, those in training would be employed mainly or wholly in repetitive routine work and would learn little of the fundamentals of their subject and perhaps only a limited repertoire of technical methods As a corollary,

it is important that the medical staff of departments of pathology selected for teaching, in hospitals other than teaching hospitals, should be adequate to allow the senior members time in which to teach all juniors systematically Such an arrangement would, in the end, more than justify the expense of the salaries paid out for little immediate return other than, say, resident alternate night duty required of trainees

When, in the future, conditions become more stabilised it should be possible for the university departments of pathology to be responsible for the initial period of post-graduate training and provide, in a two year course, a curriculum similar to that at present followed for one year at the Postgraduate Medical School of London for the university diploma in clinical pathology The additional year would permit of methods being learned less hurriedly and practised more frequently, and at the same time allow of related systematic reading Such university postgraduate courses in pathology for all trainees should not be regarded as the ideal and the unattainable, but rather as the best and an essentially economic means of providing well trained pathologists

Department of Pathology
North Middlesex Hospital London N 18 J F HEGGIE

PAY OF THE PSYCHIATRIC SOCIAL WORKER

SIR —In your issue of Aug 12, Dr Sessions Hodge describes an advertisement issued by Nottinghamshire county council public health department as "a denigration of the professional standards" of psychiatric social workers I would suggest that, far from affronting that profession, this county council have done it a service by calling attention to its plight

Nottinghamshire offered £370–£20 p a –£530 p.a to duly qualified psychiatric social workers, and to unqualified persons"—that is social workers without the mental health certificate—£480–£15 p.a –£525—that is to say, the duly authorised officer scale

Thus it seems that the psychiatric social worker is not only inadequately paid but is penalised to the tune of £110 p a for holding an additional qualification for which he or she has been selected on merit and trained for an additional year The gross difference is, of course, in the starting salary The scale for psychiatric social workers was last revised in December, 1946, since when the cost of living has risen by 13 points That it has not been revised since then is not for want of trying

There are now between 80 and 100 vacant posts awaiting qualified psychiatric social workers Further, the number of applicants selected for training does not wholly fill even existing courses, and those who do the selection are concerned that not enough applicants of the right quality are coming forward for this very responsible work Their value is unquestioned, I for one recognise how greatly my own professional contribution depends on that of my psychiatric social worker colleagues

The present salary scale, agreed between the voluntary hospitals and the medical auxiliaries before the National Health Service started, has been the subject of negotiation through the Whitley Council and, as your annotation suggests, they have been "unaccountably slow in reaching agreement" To block negotiations by procrastination is to cease to negotiate If there is no intention to move, then it is difficult to see what other course can be taken except to strike But professional people are neither accustomed nor willing, so far, to use the strike as a weapon, and any profession concerned with human welfare and suffering would be loth to withdraw its services in order to force revision of salary-claims however well this action was justified To be penalised by £110 a year for holding a higher qualification is so patently absurd that in industry it would be met by a threat to strike which would command so much public interest and sympathy that probably the strike would never be necessary In the negotiations which preceded the Appointed Day, the risk that the unwillingness of professional people to strike would be exploited was indignantly repudiated

London W 1 E M CREAK

SIR,—On behalf of the Association of Psychiatric Social Workers I would like to thank you for the consideration you have given to the situation facing our members Apart from the deterrent effect of the present low salary scales on recruitment, to which you and Dr Sessions Hodge refer, there is a very real threat to the professional status of psychiatric social workers Some employing bodies, disregarding the high standard of our professional training, seem to take the view that years of experience in the administration of the Mental Deficiency and Mental Treatment Acts are equivalent to training as a psychiatric social worker On the other hand, there is evidence in other quarters that understanding and appreciation of psychiatric social work has been growing apace—much faster than the present supply of personnel, for there are some 80–100 vacant posts The Nottingham council is by no means the only employing authority faced by the twin evils of a shortage of the trained personnel whom they would wish to employ, and a regulation obliging them to offer a higher salary to less well qualified workers whom they might wish to employ only temporarily The present situation is caught in an administrative tangle, so that the less adequately trained workers in the mental health field have received better treatment in negotiation than ourselves In this situation good will has proved insufficient

A full statement of our case has been made by our representatives on the Whitley Council, and in addition the association has repeatedly submitted memoranda on the professional duties and responsibilities of psychiatric social workers to the Mackintosh Committee, the Ministry of Health, and employing bodies These representations are quite ineffective in face of the present administrative regulation which binds officials in the National Health Service Our only hope now is for a professional and informed public opinion which will act on our behalf We do not press for undue financial advantage in face of the national economic situation, but only for some equitable settlement, so that psychiatric social work may continue to develop its proved values in the mental health field

1 Park Crescent
London W 1 H E HOWARTH
Chairman Association of Psychiatric Social Workers

ESTIMATION OF PROTHROMBIN-TIME

SIR,—In his letter of July 29 Prof A L Copley (to whom I am most grateful for his distinguished support) confirmed the observation reported in my letter of June 17—that prothrombin time estimations are made irregular by traces of soapless detergents I have also received letters from laboratory workers in this country and abroad confirming my observation, and some of them tell me that they have been aware of the effect by trial and error for several years Others thank me for pointing out a fact which may explain why they have had difficulty with prothrombin-time estimations All this shows how important it is that technical details of this type should be published at the first opportunity From the letters I have received, it is clear that at various places in the world a good deal of time and patience have been spent in making the same observation all over again, and in some places where the problem had not been solved prothrombin time estimation has been unreliable and irksome

Pathological Laboratory,
District Hospital
Pembury Kent. H LEHMANN

PUBLICITY FOR CANCER

SIR,—Your annotation last week refers to my article of Sept 9 in the *Medical Officer* I am convinced that thousands of lives would be saved if correct methods of cancer education and publicity were carried out on a large scale, because the better knowledge concerning symptoms would enable patients to seek medical advice at a stage in the disease when it may be curable On the other hand, I agree with you that it is unfortunate that the first big publicity given to the disease should take the form it did in *Picture Post* It will, I fear, strengthen the hands of those members of the medical profession who, not having given the matter sufficient consideration, oppose the education of the public concerning cancer

London W 1 MALCOLM DONALDSON

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SIR,—Dr Bull and Dr Lennox raise an interesting point in their letter of Aug 19 The possibility of sucrose activity had occurred to us Owing to the frequent use of that substance in this hospital in the past, we were able to examine material from several fatal cases in which large amounts had been given The renal changes were not at all like those described by us in our paper on post partum uræmia

Perhaps, however, it would be better to confine discussion to our case no 1 This patient died of uræmia after 13 days' illness The only gross change in the kidneys was hydropic degeneration—really necrosis—of first convoluted tubules At no time did she receive sucrose Intravenous glucose was administered on one occasion only, 11 days before her death It seems unlikely that this could be responsible for the appearances noted post mortem Assuming, however, that our interpretation is wrong and that the histological changes were merely due to glucose, at least two questions arise Why did the patient suffer from oliguria, and what was the cause of her uræmia? One shudders to think of the fate of all those patients who, in the course of tubular reabsorption tests, receive large amounts of glucose in concentrated solution

With regard to Mr Bracey's thesis (Sept 2), we would not disagree with the first part which states that the changes described were related to anoxia The points he raises in the second part are rather difficult to understand Assuming that overhydration did occur in these patients, why were the lesions localised to the upper part of the nephron while the distal convoluted tubules, which are commonly thought to be the main sites of salt and water interchange, were unaffected? If the lesions in the upper nephron were, in fact, due to over hydration, it is strange that these lesions have not previously been described, since the common treatment of oliguria, until recently, was overhydration Again, does Mr Bracey consider that overhydration, by producing the lesions in the upper nephron, can cause oliguria?

Royal Maternity and Women's Hospital Glasgow A D T GOVAN
I MACGILLIVRAY

SIR,—The findings in an experiment carried out by a colleague and myself may perhaps be of interest in relation to the article by Dr Telford Govan and Dr MacGillivray (July 22) and the subsequent correspondence

The nerves accompanying the left renal artery of an anæsthetised rabbit were stimulated at intervals over a period of about six hours, and the kidneys thereafter removed for fixation and histological examination Dr G J Cunningham found marked changes (not detailed here) in the left kidney, and no corresponding ones in the right kidney Prof J H Dible, who also examined the left kidney, said "I am struck by what appears to be a swelling of the primary convoluted tubule cells—intracellular œdema which seems to be the chief factor in the swelling of the organ A few of the secondary convoluted tubule cells and a good many collecting tubules contain hyaline cast like material."

London W 1 JOHN SOPHIAN

PSYCHOSOMATIC MEDICINE

SIR,—I read with great interest Professor Pickering's article of July 15 As a student I was more fortunate than he was, for, far from being out of sympathy with my teachers' favourite theories, I was often enthused by them The teacher to whom I am thus indebted most is Professor Pickering himself, and I was the more disappointed to read how lightly he dismisses the psychosomatic concept

No doubt the apparent rejection of this concept by so many eminent physicians is due to several causes (1) failure of the psychiatrists concerned to define their ideas clearly, (2) the time lag which makes our conservative (still Virchow dominated) profession the best part of a century and a half out of line with modern philosophy, and (3) unconscious blind spots in surveying the realm of the psyche

The term "psychosomatic" is bad, for it emphasises the lately united fracture line between mind and body, living (reacting) in a total environment, but the idea that man is a unified totality (of psyche and soma) has been used by medical men certainly before and even since the mechanistic phase in medicine Indeed, it is with such an idea that we all approach patients Psychosomatic medicine is in fact the simultaneous study of psychological and somatic factors in their interrelation, in their relation to the whole person, and in the relation of the total personality to the total environment (physical and mental)

I cannot think that Professor Pickering had this concept in mind when he squeezed "psychosomatic origin" between "focal sepsis" and "the diseases of adaptation" and dismissed it in one paragraph Probably he was concerned rather with the "circumscribed" hypothesis that there are certain diseases which find their origin mainly in emotional conflict Here the operative words are "origin" and "mainly", for the emotion may be of major (but not total and single) importance at only one stage in the natural history of these diseases Though some naïve attempts may have been made to demonstrate "a significant association between the *abnormal mental states* and the diseases in question," few are making such attempts now Nevertheless there is strong evidence of a relation between disturbed emotion (psychic) and these diseases (somatic)—a relation not necessarily causal but as significant as the relation between electro encephalographic changes and epilepsy or between insulin and diabetes Again, if it is conceded that "psychotherapy" sometimes (even rarely) "produces dramatic or repeatable effects in these diseases" it is surely necessary to explain that fact instead of rejecting it The effect of psychotherapy (in centres where it can be judged fairly) is as dramatic and repeatable as the effect of any of the main weapons of therapeutics—which are notoriously capricious because they have to obey psychosomatic as well as pharmacological laws Professor Pickering says that "the hypothesis fails to account for (a) the variety of mental states causing the same disease entity, and (b) a single mental state being associated with a variety of disease entities", and cast in the above words the statement is undeniable Yet it is clear that the psychosomatic concept does not seek to account for things in that way, nor is it certain that there is such a thing as a "disease entity" Further, using Professor Pickering's valuable approach to research

through therapy, one has often observed in the psycho therapy of a patient that he runs the gamut of such apparently disconnected "diseases" as early essential hypertension, migraine, asthma, urticaria, frequent colds, and even a frank neurosis, before he returns to a fair adjustment to both the internal and external environment The effects of adrenocorticotropic hor mone further tend to discredit the idea of "disease entities"

However, it is the final tone of the address which most affected me personally Though I can see the use of scepticism and caution in medicine, I believe our teachers would give more impetus to fruitful research if they viewed the entire field with the eyes of Dr J S L Brown, of McGill University He compares it to icebergs, seven-eighths of which are submerged in water (and have hitherto not been perceived by medical science), and he points out that it is only the peaks on the surface that we have been in the habit of calling *diseases* To this we should add that icebergs are constantly drifting and changing in shape, and therefore, at best, when we study them we isolate them from the time space continuum

Department of Psychiatry
University of Toronto D CAPPON

SIR,—As Dr Halliday (Sept 2) says, the abuse recently heaped on "psychosomatic medicine" derives from its wrongful employment, it is not a description of the no man's land between medical psychology and "pure medicine," but merely a term found useful by the clinician in recent years to emphasise the inseparable alliance between the patient's psyche and its more obvious corporeal attachment

I do not remember, as a medical student twenty years ago, hearing any emphasis placed on the relation between the patient's mental make up and his symptoms The disturbance of function which gives rise to a symptom may be purely organic in origin or purely emotional, or (more usually) a mixture of both The only virtue of the current popular use of the word "psychosomatic" is that it drives home the existence of this last large symptomatic group Continual awareness of the inter play of mind and body is ever necessary, and is one of the characteristics of the good clinician

The student should be introduced to the relationship of mind and body at the very outset of his clinical career It is important that he should realise that anorexia, for example, can be produced by anxiety as well as by cancer of the stomach for he will certainly see more nervous anorexias than those due to malignant disease The right teacher to emphasise this is the general physician, and the right moment is the first student week in the wards or the outpatient department

Stanley Hospital
Liverpool RONALD ELLIS
Physician
United Liverpool Hospitals

SIR,—Dr Eastwood (Aug 12) would have us draw a clear distinction between primary bodily illness causing psychological disease and primary psychological disease causing bodily illness It is the essence of the concept of "body mind" that such distinction is impossible As to the rarity of psychosomatic illness in general practice I should have thought that asthma, duodenal ulcer, and spastic colon were common in general practice and that these diseases were classed as psychosomatic by most authorities

As to the charge that psychogenic disease is too often diagnosed on the strength of negative laboratory findings, it is hard to see what else a doctor can do when faced with, say a patient who complains of indigestion, when the X ray report is negative and no occult blood is found in the stools Very likely the doctor will know that the patient s wife is a slut or that he has financial worries and in any case a tactful history-taking will discover facts like these Are not such cases also common in general practice?

Bridlington P D H CHAPMAN

SUBSTITUTES FOR CURARE

SIR,—I read with great interest your leading article on this subject[1] and subsequent correspondence

I first used *d* tubocurarine chloride in connection with convulsion therapy in August, 1939, and have subse quently had experience with 'Intocostrin,' decamethonium iodide, and 'Flaxedil' I can corroborate Dr Davies's[2] observations that the synthetic substances do not affect the vital capacity to anything like the same extent as the alkaloid Indeed, the difference is very striking when registered graphically In my experience flaxedil is, however, in turn superior to decamethonium iodide in this and other respects[3]

I have also read with great interest your correspondence on neostigmine injections in connection with this treat ment Without disagreeing with the principle of such a routine, I regard it as essential when handling this class of drug that an artificial respirator should always be at hand In the last ten years I have used one or other of these drugs many hundreds of times, and without this precaution I would very occasionally have felt anxiety for the patient's welfare At one time psychiatrists did not seem to agree that convulsion therapy merited the routine use of a muscular relaxant, and fracture com plications and, indeed, fatalities continue in some clinics where such a routine is not followed

The administration of either neostigmine or penta methonium iodide is sometimes fraught with hazards, but if one's vigilance is centred on respiration rather than physiological antidotes no anxiety whatever need be entertained In our experience at this hospital, flaxedil is the muscular relaxant of choice and this is also the opinion of the nursing staff, who are in a good position to estimate the value of the physician's treatment unhampered by prejudice

Department of Psychiatry
Dunedin Hospital New Zealand HAROLD PALMER

AFTER GASTRECTOMY

SIR,—Your well balanced and informative leading article last week accurately reflects the predominant surgical opinion and so gives scant attention to the anterior Polya type of operation But I believe this operation to be preferable to all others in its freedom from after effects Certainly the Billroth I operation does not give such good results, possibly because of the loss of former freedom of movement of the stomach when it distends The anterior Polya operation is simple There is no objection to bringing the jejunum up in front of the colon, because if the afferent loop is attached to the greater curvature its passage from the duodeno jejunal junction to the greater curvature lies in front of the very deeply placed splenic flexure and there is no danger of compressing the transverse colon

At the completion of the operation the stomach retracts up into the abdomen under the left costal margin, and the line of the anastomosis will be seen to be almost horizontal but often with the greater curvature end a little lower than the other Skiagrams show that the blind end of the duodenum always fills That food should pass into this part of the bowel is wholly desirable The duodenal cap, the proper mixing and neutralising chamber for the acid chyme and pancreatic juices, has gone, the blind end serves this purpose It fills, performs its mixing functions, and then expels its contents onwards along the jejunum In order that this process should take place easily, it is essential that there should be no

1 *Lancet* 1950 1 1043
2 Davies D L *Ibid* p 1091
3 Palmer H *N Z med J* June 1950 p 262

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After the 1914–18 war he was energetic in reviving the Association of Physicians of Great Britain, of which he was successively secretary, treasurer, and president At the Royal Society of Medicine he had presided over the sections of diseases of children and of medicine, and in 1937 Queen's University, Belfast, conferred on him the honorary degree of LL.D while he was presiding over the section of diseases of children at the B M A. meeting there The Royal Australasian College of Physicians also made him an honorary fellow

H L T writes. "Herbert Morley Fletcher had many attributes, physical and intellectual, and throughout a long life he used them to the full for his own enjoyment and for giving pleasure to others Outside the strict professional paths of hospital and practice he employed his administrative and social gifts in many directions King Edward's Hospital Fund was an interest very close to him He served it for over thirty years and less than four months ago he was visiting convalescent homes on its behalf A good committee man and a good chairman with a grasp of essentials, he had the power of keeping speakers to the point with an easy hand He never lost his pleasure in athletics from the time when he was president of the C U.A C, and he rarely missed the Oxford and Cambridge sports Indeed he enjoyed all social occasions An attractive voice and a flow of entertaining conversation made him a delightful companion, and he liked a good cigar and a glass of wine Friendliness, kindness, courtesy, and a boyish enthusiasm which never flagged, these he offered to fortune, and fortune gave him two long and happy married lives"

Dr Morley Fletcher's first wife, Ethel Frances Crossley, of Halifax, by whom he had two sons and three daughters, died in 1918 One of his daughters married Mr H U Willink, whose sister Mary Christina Willink, became his second wife There are two daughters of this marriage

C M H H writes "I met Morley Fletcher for the first time fifty years ago this month, when I entered St Bartholomew's Hospital as a student from Oxford What struck me immediately was his youthful and debonair appearance, and his fine athletic figure Morley, as we all called him, enjoyed life to the full He was excellent company, and I have had many happy days with him playing golf, fishing, or shooting He was a good shot, and formed part of a syndicate with a large sprinkling of Bart's men, who had a magnificent shoot near Thetford, where on several occasions I was his guest Alas! those days are gone, never to return But it was as a host that Morley really excelled There must be hundreds of Cambridge Bart's men and their guests who remember his large room at 98, Harley Street, where all were welcome after the annual Cambridge Bart's dinner, and where Norman Moore recited as an annual ritual the story of Hairy Rachey (I've probably spelt that wrongly) After Norman Moore's death, Reginald Vick carried on the tradition admirably, being prompted, if ever there were any need, by the audience, who knew the story by that time as well as he did Those were indeed great days of an epoch that has passed away We salute both Morley and his times"

CHARLES CLAUD TWORT

M.D ABERD

Dr C C Twort, sometime director of cancer research in the University of Manchester, died on Aug 21 at the Hammersmith Hospital

He was educated at Aberdeen University, where he graduated M.B in 1909 and M.D in 1913 In 1910 he spent some time in Paris as Thompson fellow working in the laboratory of Professor Levaditi at the Pasteur Institute Later he joined his elder brother, the late F W Twort, F R.S, at the Brown Institution, London From there he published in 1913 an important paper on the pathogenicity of Johne's bacillus His work as Rose fellow at St. Bartholomew's Hospital was interrupted by the 1914–18 war, during which the two brothers found themselves again in close association at the base laboratory at Salonika

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A C writes "Twort's patience, thoroughness, and vision as an experimenter were outstanding, and withal he was so modest concerning his own achievements Apart from his many original contributions to scientific medicine, it is as a lover of home, of his family, of his country, and of his friends that 'C C' will be most missed Sincere and candid in his views, he had little or no use for the plaudits of the world As a young Englishman abroad, where I first met him, Britain never had a better or more characteristic representative—just and dependable in all his relationships To those honoured by his friendship, his cheerfulness, his loyalty, his courage, and his profound common sense were infectious and beyond price While being the last to preach he set much store by the eternal values of charitableness, courtesy, kindness, and gentleness"

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FLORENCE LOUIS

M.D LOND, M.R C P

Florence Louis, who died in London on Aug 16, was an outstanding student of the Royal Free Hospital, where she graduated M B with honours in 1927 While a young resident, she discovered that she had diabetes and with characteristic courage decided that this should not influence her way of life She married during her appointment as medical registrar at the Royal Free and had two sons Then began the climb up the professional ladder that found her physician to the South London Hospital for Women at the time of her death at 46

During the war she lost her much loved doctor-brother at Arnhem and her younger son—and from that time she drove herself unmercifully, seeing patients, doing coroner's post-mortems, and teaching students During the last year she suffered a succession of illnesses so severe that those who saw her marvelled at her recovery her amazing courage and tenacity enabled her to surmount each crushing blow, for she knew too much to be in any doubt of their significance

She was a lovable and lovely person, relentless in her pursuit of knowledge and in her efforts to help her patients A woman of great integrity, who had suffered all her life from "the slings and arrows of outrageous fortune," she had not become embittered in the process Her husband and son, Julian and Stephen Slade, have the sympathy of all her friends in the departure of so rare a person D J K B

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kink at the right extremity of the anastomosis, for at this point kinks cannot be undone by propulsive peristalsis, which has been abolished in the region of the anastomosis by the division of the circular muscle fibres This is the reason for sewing up the lesser curvature end of the severed stomach and attaching the jejunum to it The intact intestinal wall by contraction can undo any kink at the point where the bowel leaves the stomach, as it does during all the passage of the food along the normally kinked small intestine I do not believe in the so called valve action The length of the opening left in the stomach should be $2^3/_8$ in This measurement, found by experience to be satisfactory, is assured by using a fenestrated clamp of the proper size

The amount of stomach removed cannot be gauged accurately on the operation table as being three fourths or seven eighths as the case may be It is better to take an anatomical point for its section—namely, the area where the territory supplied by the right gastro epiploic artery meets that of the left This point can usually be satisfactorily demonstrated There is no need to be more radical than this Indeed there is more danger of bad after effects in doing so

Dumping and other symptoms following gastrectomy seem to be much rarer after operations performed according to this pattern

St Mary's Hospital
London W 2 CHARLES A PANNETT

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis in the week ended Sept 9 were paralytic 327 (302), non-paralytic 186 (189), total 513 (491) The figures for the previous week are in parentheses There was an increase of 25 paralytic cases and a decrease of 3 non-paralytic cases—net increase 22—compared with the preceding week Non-paralytic cases in the week under review comprised 36 2% of the total, compared with 38 5% in the preceding week

Stafford had an increase of 15 notifications compared with the week before, otherwise any increases were fairly generally distributed Material decreases occurred in Durham (7) and Norfolk (8) The county areas of Cambridge and Radnor have notified no cases in the five weeks up to and including Sept 9 In the same period the following contributed 1 notification only Suffolk (West), Isle of Ely, Soke of Peterborough, and Anglesey

The uncorrected notifications for the week corresponding to that under review in 1947, 1948, and 1949 were 708, 76, and 306 Total uncorrected notifications for 1950 up to and including the week under review are 5126 The corresponding figures for 1947, 1948, and 1949 were 4984, 1214, and 2647

Infectious Diseases in England and Wales

Disease	Week ended Aug			
	5	12	19	26
Diphtheria	45	49	31	41
Dysentery	179	211	141	137
Encephalitis				
Infective	6	7	12	3
Postinfectious		2	1	
Food poisoning	116	225	160	263
Measles excluding rubella	7973	6429	5530	4280
Meningococcal infection	26	21	21	18
Ophthalmia neonatorum	45	37	35	34
Paratyphoid fever	5	2	9	10
Pneumonia primary or influenzal	273	257	233	177
Poliomyelitis				
Paralytic	262	275	375	369
Non paralytic	105	118	175	220
Puerperal pyrexia and fever	82	93	80	85
Scarlet fever	956	697	614	635
Smallpox				
Typhoid fever	8	5	9	11
Whooping-cough	3687	3422	3939	3725

Obituary

HERBERT MORLEY FLETCHER

M A, M D CAMB, LL D BELF, F R C P, F R A C P

Dr H Morley Fletcher, consulting physician to St Bartholomew's Hospital, died on Sept 9 at his home at Petworth in Sussex

He was born in 1864 at Liverpool, the second son of Alfred Evans Fletcher and Sarah Morley, and he was educated at Mill Hill School and Trinity College, Cambridge, where he took his B.A in 1887 Like his younger brother, Walter Fletcher, who later became the first secretary of the Medical Research Council, he was a fine athlete, and in 1888 he was elected president of the Cambridge University Athletic Club After qualifying from Bart's in 1890 he spent some postgraduate years at Freiburg and Vienna, and in 1892 he contributed to *Zieglers Beiträge* a paper on "die sogenannte Periarteritis Nodosa" In 1894 he published a translation of von Kahlden's *Methods of Pathological Histology*

[Bereford

Morley Fletcher held house-appointments and demonstratorships at Bart's before he settled in consulting practice in London He quickly won a name for himself not only as a general physician but also as a specialist in diseases of children His appointment to the staff of the East London Hospital for Children was among the first of his honorary appointments, and fifty years ago there was no more stimulating centre for the study of children than that in which he took part with Eustace Smith, Coutts, and Gossage at the little Shadwell hospital in the East End In 1904 he was appointed to the staff at Bart's, and soon after, with Hugh Thursfield, he was responsible for the development of the fine pædiatric department there From its foundation in 1928 he played a prominent part in the affairs of the British Pædiatric Association, of which for many years he was treasurer, and in 1930 he succeeded Still and Cautley as its third president

Of this side of his career H C O writes "Herbert Morley Fletcher in his time served many causes and had many interests, but perhaps it was as a physician for children that he would best like to be remembered His devotion to pædiatrics began early and continued to the end The passing years, that brought age to others, seemed to leave him untouched, and to the last, among a younger generation trained on very different lines, he moved easily and happily, an honoured figure whose presence was always welcome For if Morley Fletcher loved pædiatrics he was loved by pædiatricians"

Fletcher was on the staff of many other hospitals in London and the home counties, notably Queen Charlotte's Hospital, the Osborne Convalescent Home for Officers, Bushey Heath Hospital, Hertford County Hospital, the Metropolitan Convalescent Institution, and the Florence Nightingale Hospital He was also a member of the medical consultative board of the Navy He became a vice president of the medical college at Bart's, and he examined for the universities of Belfast, Cambridge, Durham, Glasgow, Sheffield, and for the Conjoint Board He had been elected F R C P in 1900 and he later served the college as councillor and senior censor During the 1914–18 war he worked with the rank of major at the 1st London General Hospital

His retirement from Bart's in 1929 only meant that he was more readily available for other work In 1933 he was appointed to the advisory committee on the administration of the Cruelty to Animals Acts, and he travelled up regularly from Petworth for meetings of the King's Fund On his way to preside over meetings of the nursing recruitment committee of the Fund he would often drop in at the offices of the *Practitioner* to visit his son

After the 1914–18 war he was energetic in reviving the Association of Physicians of Great Britain, of which he was successively secretary, treasurer, and president At the Royal Society of Medicine he had presided over the sections of diseases of children and of medicine, and in 1937 Queen's University, Belfast, conferred on him the honorary degree of LL D while he was presiding over the section of diseases of children at the B M.A. meeting there The Royal Australasian College of Physicians also made him an honorary fellow

H L T writes, "Herbert Morley Fletcher had many attributes, physical and intellectual, and throughout a long life he used them to the full for his own enjoyment and for giving pleasure to others Outside the strict professional paths of hospital and practice he employed his administrative and social gifts in many directions King Edward's Hospital Fund was an interest very close to him He served it for over thirty years and less than four months ago he was visiting convalescent homes on its behalf A good committee-man and a good chairman with a grasp of essentials, he had the power of keeping speakers to the point with an easy hand He never lost his pleasure in athletics from the time when he was president of the C U.A C, and he rarely missed the Oxford and Cambridge sports Indeed he enjoyed all social occasions An attractive voice and a flow of entertaining conversation made him a delightful companion, and he liked a good cigar and a glass of wine Friendliness, kindness, courtesy, and a boyish enthusiasm which never flagged, these he offered to fortune, and fortune gave him two long and happy married lives"

Dr Morley Fletcher s first wife Ethel Frances Crossley, of Halifax, by whom he had two sons and three daughters, died in 1918 One of his daughters married Mr H. U Willink, whose sister Mary Christina Willink, became his second wife There are two daughters of this marriage

C M H. H writes "I met Morley Fletcher for the first time fifty years ago this month, when I entered St Bartholomew's Hospital as a student from Oxford What struck me immediately was his youthful and debonair appearance, and his fine athletic figure Morley, as we all called him, enjoyed life to the full He was excellent company, and I have had many happy days with him playing golf, fishing, or shooting He was a good shot, and formed part of a syndicate with a large sprinkling of Bart s men, who had a magnificent shoot near Thetford where on several occasions I was his guest Alas! those days are gone, never to return But it was as a host that Morley really excelled There must be hundreds of Cambridge Bart s men and their guests who remember his large room at 98, Harley Street, where all were welcome after the annual Cambridge Bart's dinner, and where Norman Moore recited as an annual ritual the story of Hairy Rachey (I've probably spelt that wrongly) After Norman Moore's death, Reginald Vick carried on the tradition admirably, being prompted, if ever there were any need, by the audience, who knew the story by that time as well as he did Those were indeed great days of an epoch that has passed away We salute both Morley and his times"

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M.D ABERD

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Notes and News

APPROVED NAMES FOR DRUGS

THE British Pharmacopœia Commission has issued the following supplementary list of approved names, some of which were announced last year (see *Lancet*, 1949, ii, 354)

Approved Name	*Other Names*
Alphaprodine	α 1 3 Dimethyl 4 phenyl 4 propionoxy piperidine
Amidone	6 Dimethylamino 4 4 diphenylheptan 3 one Physeptone
Antazoline	2 *N* Benzylanilinomethyliminazoline Antistin Histostab
Benzhexol	1-*cyclo*Hexyl 1 phenyl 3 piperidino 1 propanol Artane is the hydrochloride
Betaprodine	β 1 3 Dimethyl 4 phenyl-4 propionoxy piperidine
Chloramphenicol	D (−) *threo* 2 Dichloroacetamido 1 *p* nitrophenyl 1 3 propanediol Chloromycetin
Chlorcyclizine	(±) 1-(*p* Chlorobenzhydryl)-4 methyl piperazine Histantin is the hydrochloride Di paralene is the hydrochloride
Dapsone	4 4 Diaminodiphenyl sulphone
Decamethonium iodide	Decamethylene 1 10 bistrimethyl ammonium di iodide C 10
Dexamphetamine	(+) Amphetamine Dexedrine is the sulphate
Diethazine	*N* 2 Diethylaminoethylphenothiazine Diparcol is the hydrochloride
Dimethyltubocurarine iodide	Dimethyl ether iodide of (+) tubo curarine
Diphenhydramine	Benzhydryl 2 dimethylaminoethyl ether Benadryl is the hydrochloride
Ethyl pyrophosphate	Tetraethyl pyrophosphate T E P P
Gallamine	1 2 3 Tri(2 -diethylaminoethoxy) benzene Flaxedil is the triethiodide
Hexamethonium iodide	Hexamethylene 1 6 bistrimethyl ammonium di iodide C 6
Hydroxypethidine	Ethyl 4 *m* hydroxyphenyl 1 methyl piperidine 4-carboxylate
Isoamidone	6 Dimethylamino 5 methyl-4 4-di phenylhexan 3 one
Isoprenaline	*iso*Propylnoradrenaline Aleudrine is the sulphate, Neo Epinine is the sulphate Isupren is the hydro chloride Neodrenal is the sulphate
Ketobemidone	4 *m* Hydroxyphenyl 1 methyl 4 pro pionylpiperidine
Lignocaine	Diethylaminoacet *m* 2 xylidide Xylocaine is the hydrochloride
Lindane	γ 1 2 3 4 5 6 Hexachloro*cyclo* hexane
Menadoxime	Ammonium salt of 2 methylnaphtha quinone 4 oxime *O* carboxymethyl ether Kapilon Soluble
Mephenesin	1 2 Dihydroxy 3 (2′ methylphenoxy) propane Myanesin
Mepyramine	*N p* Methoxybenzyl *N′N* dimethyl *N* 2 pyridyl ethylenediamine Anthisan is the hydrogen maleate, Neo antergan is the hydrogen maleate
Methacholine chloride	Acetyl β methylcholine hydrochloride Mecholyl Chloride, Amecol
Methadol	6 Dimethylamino-4 4-diphenylheptan-3-ol
Methadyl acetate	6 Dimethylamino 4 4 diphenyl 3 heptyl acetate
Methoin	5 Ethyl 3 methyl 5 phenylhydantoin Mesontoin
Mustine	Di (2 chloroethyl)methylamine Nitrogen mustard is the hydrochloride
Naphazoline	2 (Naphthyl 1 methyl)iminazoline Privine is the nitrate
Pentamethonium iodide	Pentamethylene 1 5 bistrimethyl ammonium di iodide C 5
Phenadoxone	6 Morpholino 4 4-diphenylheptan 3 one Heptalgin is the hydrochloride
Phenindamine	1 2 3 4 Tetrahydro 2 methyl 9 phenyl 2 azafluorene Thephorin is the hydrogen tartrate
Phenylpropanolamine	2 Amino 1 phenyl 1 propanol Propadrine is the hydrochloride
Potassium menaphthosulphate	Dipotassium 2 methyl 1 4 disulphato naphthalene dihydrate
Promethazine	*N* (2 Dimethylamino *n* propyl)phenothiazine Phenergan is the hydrochloride
Quinalbarbitone sodium	Monosodium derivative of 5 allyl 5 (1 methylbutyl)barbituric acid Seconal Sodium
Thiacetazone	4 Acetamidobenzaldehyde thiosemicarbazone
Tolazoline	2 Benzyliminazoline Priscol is the hydrochloride
Troxidone	3 5 5 Trimethyloxazolidine 2 4 dione Tridione
Tripelennamine	*N* Benzyl *N N* dimethyl *N* 2 pyridyl ethylenediamine Pyribenzamine is the hydrochloride

COLONIAL SERVICE AND THE N H S

UNDER the National Health Service (Amendment) Act 1949, doctors, dentists, and nurses who have been employed in the National Health Service and who take short-service engagements—not exceeding six years—in the Colonial Research Service, the Colonial Medical Service, the Queen Elizabeth Colonial Nursing Service, or the services of Colonial governments can, if they wish, preserve their superannuation in the N H S An outline of the scheme is set out in circular R H B (50) 85 and further details can be had from the Health Services Superannuation Division, Ministry of Health, Government Building, Honeypot Lane, Stanmore, Middlesex

CHANGING DOCTORS

AFTER consultation with the General Medical Services Committee and the Executive Councils Association, the Minister of Health has decided to place some restriction on the patient's right to transfer immediately from one National Health Service doctor to another In future the patient, unless he has changed his address, must either obtain his present doctor's consent in writing or else send his medical card to the local executive council together with a letter notifying his intention to transfer In the latter event the patient will normally be able to choose a new doctor 14 days after the council has received the card and letter, but the actual date on which he can transfer will be stated by the council when it returns his medical card Patients who have moved to a different address will still be able to transfer immediately, by taking their medical card to the doctor of their choice Details of the new arrangements are given in circular E C L 98/50 and its appendix

MIDWIVES UNDER THE NATIONAL HEALTH SERVICE

IN the last two years the Central Midwives Board[1] have been clearing their roll of the names of those who have retired from practice died, or failed to notify their wish to remain on it There were 64,490 names on the register on March 31, 1950—a fall of over 12,500 since the previous year Those who notified their intention to practise during 1949, however, numbered 18,053, or 234 more than the number for 1948 The number practising has been rising steadily since 1942, and the proportion trained under the modern system, which came into force in 1939, has now risen to nearly half Over 70% of those practising in 1949 were between the ages of 26 and 50—in other words they were experienced midwives in the best years of their working lives The training is thorough, and the examination pass rate is good in 1949, just under a quarter failed to get through the first examination and about an eighth failed to get through the second Wastage amounted to only 8 6% of registrations, and was mostly from among those doing the first period of training

The National Health Service has had one adverse effect on training hospital confinements increased so much that it was difficult to give pupil midwives a thorough training on the district The board, together with the Central Midwives Boards for Scotland and for Eire, and the Joint Nursery and Midwives Council for Northern Ireland, discussed the idea of reducing the number of district cases which a pupil midwife is required to conduct during her second period of training, but decided that this would lower the standard of training The pupil must therefore still conduct her 10 district cases over a period of three months, in addition to the 20 cases she conducts in hospital during part I training Experienced midwives of the type we have all come to value owe much to this thorough supervised teaching during their training years

The board believe the organisation of midwifery schools could be improved and supports the view of the Working Party on Midwives that experiments should be made to determine the relation of such schools to hospitals They are conducting limited experiments in five or six schools in England and Wales, but note that at least a year must pass before they can assess results

The training of midwives and pupil midwives in the administration of gas and air analgesia has gone on very well and some 19 000 are now proficient Over 11,118 of these were in practice in 1949, representing about 60% of practising midwives The Chassar Moir attachment has been

1 Annual Report for the year ended March 31 1950 London Published for the Board by Spottiswoode Ballantyne & Co 1950 Pp 23

tried in Hertfordshire with the board s consent, and has given good results The report comments on the adminis trative inconvenience of maternity services divided under 'separate types of authority each entrusted with powers and duties to operate a particular section of the service' — but it does not develop this theme

MEDICAL DEFENCE UNION

AT the annual meeting of the Medical Defence Union on Sept 19 Mr Ivor Back, in his first presidential address said that though some thought that the increase in the subscription announced last year would lead to a considerable loss of membership, this fear had not been realised, and the member ship figure stood at 34 500 The council was disturbed by the great increase in the number of complaints, some times quite trivial, brought against doctors and dentists since the National Health Service came into being When these complaints were heard by a medical and/or dental service committee the respondent practitioner was not allowed to be represented by a solicitor or other paid advocate, though he might bring a colleague to advise and assist him There was a division of opinion in the council as to whether this ruling acts to the detriment of the respondent or not but the opinion was generally held that the chairman of all service committees should be legally qualified, to ensure, as far as possible, some uniformity of procedure Meanwhile the British Medical Association had brought forward proposals for improving the procedure of these committees and for shortening the time within which complaints may be lodged, and these met with the approval of the M.D U Another matter which continued to cause concern to the union was that of death under anæsthesia and during the past year a conference had been held with representatives of the Royal Colleges the B.M.A. and the Association of Anæsthetists

The annual report which was presented at the meeting, showed that 2125 members sought the union s assistance during 1949 and 199 cases were passed to the solicitors Of the 74 which were allegations of professional negligence, 10 came to court and 8 were won. Probably the most note worthy single event in which the union was able to help its members during 1949 was the circular from the Ministry of Health to hospital boards drawing attention to the alleged right of these authorities when sued by or on behalf of a patient for the alleged negligence on the part of their medical staff, to obtain an indemnity from the members of the staff concerned Two implications of this circular the report says are that the importance of membership of the union is now greater than ever and that members must take great care before they give a statement to the management of their hospital on any matter of complaint by a patient since any such statement may afterwards be used to their own detri ment "The golden rule for the future must be that a state ment should not be made in a case of a complaint by a patient, if there is or appears to be the slightest possibility of litiga tion, until the facts have been reported to the union and any proposed statement approved

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University of London

Prof. E. K. Tratman, F.D.S R.C.S, has been appointed to the chair of dental surgery at University College Hospital Medical School, from Oct 1

On Tuesday Oct 17, at 5 P.M., at St Mary s Hospital Medical School, W 2 Prof U S von Euler (Stockholm) is to give a lecture on Hormones of the Sympathetic Nervous System and the Adrenal Medulla

University of Sheffield

Prof F A. E Crew F.R.S will give the opening address of the session to the faculty of medicine on Wednesday Oct 11 at 5 P M. He is to speak on the Changing Emphasis of Medicine

Maida Vale Hospital

On Friday Oct 6 at 5 P.M Sir Hugh Cairns will give the opening address of the session at this hospital, London, W 9, on Colloid Cyst of the Third Ventricle

London School of Hygiene

On Thursday Oct 5 at 5 15 P.M Sir Philip Manson Bahr will give the first of an annual series of Manson lectures He is to speak on Patrick Manson the Father of Tropical Medicine Further particulars will be found in our advertise ment columns

St Thomas's Hospital

Twelve beds in the St Thomas s Hospital group have been set aside for psychiatric patients

London County Medical Society

A meeting of this society will be held at the Royal Free Hospital (North Western Branch), Lawn Road, Hampstead, N W 3, on Wednesday, Oct 4 at 3 P.M

Hunterian Society

Lord Horder will open the library and museum of this society during the annual party, which is being held at 41 Portland Place, London, W 1, on Thursday, Oct 5, at 6 P M.

London Lock Hospital

The wards of this hospital in Dean Street, W 1, have been reopened, and male patients with any of the sequelæ of venereal disease acute or chronic, skin, heart or nervous system, can now be accepted

The Institute of Dermatology

On Oct 3 the winter course of lectures of the institute will begin at St John s Hospital for Diseases of the Skin, Lisle Street London W C 2 The course will include lecture-demonstrations on medical mycology and lectures on branches of pathology relating to diseases of the skin.

Liddle Prize

The subject chosen for the 1952 award of this prize is the Effect of Hormones on the Reaction of the Tissues to Injury Further particulars may be had from the dean of the London Hospital Medical College, Turner Street London E 1 Essays must reach the hospital not later than July 31, 1952

International Congress of Cardiology

At the congress held in Paris from Sept 3 to 9, the British Government was represented by Prof. Crighton Bramwell, and the Medical Research Council by Prof John McMichael Upwards of 50 members of the British Cardiac Society attended the congress, their representative being Sir John Parkinson

Control of Illegal Opium Traffic

A United Nations committee is reported by B U.P to have approved, at a meeting in Geneva the principle of an international opium monopoly to be set up within the United Nations to end illegal traffic in the drug The committee s report which will be submitted to the United Nations Narcotic Commission, recommends that this monopoly should have the right of inspection in the territories of nations adopting the agreement

Institute of Obstetrics and Gynæcology

On the retirement of Prof James Young from the chair of obstetrics and gynæcology at the Postgraduate Medical School of London at Hammersmith Hospital the committee of management of the Institute of Obstetrics and Gynæcology have appointed Mr Charles D Read to the newly created post of director of the institute, which embraces the clinical teaching and research facilities of Queen Charlotte s Maternity Hospital the Chelsea Hospital for Women and the department of obstetrics and gynæcology of the Postgraduate School at Hammersmith Hospital Mr Read who has accepted the post on a part-time basis, will take up his duties on Oct 1.

Women Doctors for American Army

Authorisation has been given for women to be commissioned in the Medical Dental, Veterinary and Medical Service Corps Reserves of the U.S Army and assigned to active duty They will be eligible for service in every type of military medical facility, with the exception of forward medical installations in combat zones In making this announcement Major-General R W Bliss the surgeon general of the U S Army, said It has long been my opinion that restrictions upon the practice of medicine, dentistry, and other related specialties in the Army due solely to the sex of the individual are discriminatory We are happy, therefore to be able to offer women Reserve commissions and to bring them on active duty as Reserve officers on the basis of exact equality with men in their respec tive fields But we shall not rest on this achievement We shall pursue every opportunity to extend this equality by the enactment of legislation which will ultimately provide medical women status in the Regular Army

Notes and News

APPROVED NAMES FOR DRUGS

THE British Pharmacopœia Commission has issued the following supplementary list of approved names, some of which were announced last year (see *Lancet*, 1949, ii, 354)

Approved Name	*Other Names*
Alphaprodine	α 1 3 Dimethyl 4 phenyl-4 propionoxy piperidine
Amidone	6 Dimethylamino 4 4 diphenylheptan-3-one Physeptone
Antazoline	2 *N*-Benzylanilinomethyliminazoline Antistin Histostab
Benzhexol	1 *cyclo*Hexyl 1 phenyl 3 piperidino 1 propanol Artane is the hydrochloride
Betaprodine	β 1 3 Dimethyl 4 phenyl-4 propionoxy *piperidine*
Chloramphenicol	D (−) *threo* 2 Dichloroacetamido 1 *p* nitrophenyl 1 3 propanediol Chloromycetin
Chlorcyclizine	(±) 1-(*p* Chlorobenzhydryl)-4 methyl piperazine Histantin is the hydrochloride Di paralene is the hydrochloride
Dapsone	4 4 Diaminodiphenyl sulphone
Decamethonium iodide	Decamethylene 1 10 bistrimethyl ammonium di iodide C 10
Dexamphetamine	(+) Amphetamine Dexedrine is the sulphate
Diethazine	*N* 2 Diethylaminoethylphenothiazine Diparcol is the hydrochloride
Dimethyltubocurarine iodide	Dimethyl ether iodide of (+) tubo curarine
Diphenhydramine	Benzhydryl 2 dimethylaminoethyl ether Benadryl is the hydrochloride
Ethyl pyrophosphate	Tetraethyl pyrophosphate T E P P
Gallamine	1 2 3 Tri(2 diethylaminoethoxy) benzene Flaxedil is the triethiodide
Hexamethonium iodide	Hexamethylene 1 6 bistrimethyl ammonium di iodide C 6
Hydroxypethidine	Ethyl 4 *m* hydroxyphenyl 1 methyl piperidine 4-carboxylate
Isoamidone	6 Dimethylamino 5 methyl-4 4-di phenylhexan 3-one
Isoprenaline	*iso*Propylnoradrenaline Aleudrine is the sulphate Neo Epinine is the sulphate Isupren is the hydro chloride Neodrenal is the sulphate
Ketobemidone	4-*m* Hydroxyphenyl 1 methyl-4 pro pionylpiperidine
Lignocaine	Diethylaminoacet-*m* 2 xylidide Xylocaine is the hydrochloride
Lindane	γ 1 2 3 4 5 6 Hexachloro*cyclo* hexane
Menadoxime	Ammonium salt of 2 methylnaphthaquinone 4-oxime O-carboxymethyl ether Kapilon Soluble
Mephenesin	1 2 Dihydroxy 3 (2 methylphenoxy) propane Myanesin
Mepyramine	*N p* Methoxybenzyl *N'N* -dimethyl *N*-2 pyridylethylenediamine Anthisan is the hydrogen maleate Neo antergan is the hydrogen maleate
Methacholine chloride	Acetyl β methylcholine hydrochloride Mecholyl Chloride, Amecol
Methadol	6 Dimethylamino 4 4-diphenylheptan 3-ol
Methadyl acetate	6 Dimethylamino-4 4 diphenyl 3 heptyl *acetate*
Methoin	5 Ethyl 3 methyl 5 phenylhydantoin Mesontoin
Mustine	Di (2 chloroethyl)methylamine Nitrogen mustard is the hydrochloride
Naphazoline	2 (Naphthyl 1 methyl)iminazoline Privine is the nitrate
Pentamethonium iodide	Pentamethylene 1 5 bistrimethyl ammonium di iodide C 5
Phenadoxone	6 Morpholino 4 4 diphenylheptan 3-one Heptalgin is the hydrochloride
Phenindamine	1 2 3 4 Tetrahydro 2 methyl 9 phenyl 2 azafluorene Thephorin is the hydrogen tartrate
Phenylpropanolamine	2 Amino 1 phenyl 1 propanol Propadrine is the hydrochloride
Potassium menaphthosulphate	Dipotassium 2 methyl 1 4 disulphato naphthalene dihydrate
Promethazine	N (2 Dimethylamino *n* propyl)phenothiazine Phenergan is the hydrochloride
Quinalbarbitone sodium	Monosodium derivative of 5 allyl 5 (1 methylbutyl)barbituric acid Seconal Sodium
Thiacetazone	4 Acetamidobenzaldehyde thiosemicarbazone
Tolazoline	2 Benzyliminazoline Priscol is the hydrochloride
Troxidone	3 5 5 Trimethyloxazolidine 2 4 dione Tridione
Tripelennamine	N Benzyl N N dimethyl N 2 pyridyl ethylenediamine Pyribenzamine is the hydrochloride

COLONIAL SERVICE AND THE N H S

UNDER the National Health Service (Amendment) Act, 1949, doctors, dentists, and nurses who have been employed in the National Health Service and who take short-service engagements—not exceeding six years—in the Colonial Research Service, the Colonial Medical Service, the Queen Elizabeth Colonial Nursing Service, or the services of Colonial governments can, if they wish, preserve their superannuation in the N H S An outline of the scheme is set out in circular R.H.B (50) 85 and further details can be had from the Health Services Superannuation Division, Ministry of Health, Government Building, Honeypot Lane, Stanmore, Middlesex

CHANGING DOCTORS

AFTER consultation with the General Medical Services Committee and the Executive Councils Association, the Minister of Health has decided to place some restriction on the patient's right to transfer immediately from one National Health Service doctor to another In future the patient, unless he has changed his address, must either obtain his present doctor s consent in writing or else send his medical card to the local executive council together with a letter notifying his intention to transfer In the latter event the patient will normally be able to choose a new doctor 14 days after the council has received the card and letter, but the actual date on which he can transfer will be stated by the council when it returns his medical card Patients who have moved to a different address will still be able to transfer immediately, by taking their medical card to the doctor of their choice Details of the new arrangements are given in circular E C.L. 98/50 and its appendix

MIDWIVES UNDER THE NATIONAL HEALTH SERVICE

IN the last two years the Central Midwives Board[1] have been clearing their roll of the names of those who have retired from practice died, or failed to notify their wish to remain on it There were 64,490 names on the register on March 31, 1950—a fall of over 12,500 since the previous year Those who notified their intention to practise during 1949, however numbered 18,053, or 234 more than the number for 1948 The number practising has been rising steadily since 1942, and the proportion trained under the modern system, which came into force in 1939, has now risen to nearly half Over 70% of those practising in 1949 were between the ages of 26 and 50—in other words they were experienced midwives in the best years of their working lives The training is thorough, and the examination pass rate is good in 1949, just under a quarter failed to get through the first examination and about an eighth failed to get through the second Wastage amounted to only 8 6% of registrations, and was mostly from among those doing the first period of training

The National Health Service has had one adverse effect on training hospital confinements increased so much that it was difficult to give pupil midwives a thorough training or the district The board, together with the Central Midwives Boards for Scotland and for Eire, and the Joint Nursery and Midwives Council for Northern Ireland, discussed the idea of reducing the number of district cases which a pupil midwife is required to conduct during her second period of training, but decided that this would lower the standard of training The pupil must therefore still conduct her 10 district cases over a period of three months, in addition to the 20 cases she conducts in hospital during part 1 training Experienced midwives of the type we have all come to value owe much to this thorough supervised teaching during their training years

The board believe the organisation of midwifery schools could be improved and supports the view of the Working Party on Midwives that experiments should be made to determine the relation of such schools to hospitals They are conducting limited experiments in five or six schools in England and Wales, but note that at least a year must pass before they can assess results

The training of midwives and pupil midwives in the administration of gas and air analgesia has gone on very well and some 19 000 are now proficient Over 11 118 of these were in practice in 1949 representing about 60% of practising midwives The Chassar Moir attachment has been

1 Annual Report for the year ended March 31, 1950 London Published for the Board by Spottiswoode Ballantyne & Co 1950 Pp 23

PROPAGATION OF THE UNFIT*

L S PENROSE
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GALTON PROFESSOR OF EUGENICS IN THE UNIVERSITY OF LONDON, AT UNIVERSITY COLLEGE

IN mental deficiency work we meet one special problem which does not occur in quite the same form, requiring immediate decision, in any other branch of medical practice, and for which our medical training gives us little or no preparation I refer to the question of segregating high grade defectives because we think that, on social or biological grounds, they ought not to have children Cases can be judged by social standards based either upon moral or upon economic considerations, but here I shall confine myself mainly to the biological "fitness" of the mentally defective for parenthood

WHAT IS BIOLOGICAL FITNESS?

The term "fitness" in its ordinary use conjures up a picture of robust health—ability to go a ten mile walk before breakfast, including a swim in icy water A parallel use of the term was intended, for example, by Pearson (1912a) when it was demonstrated that alcoholism was as common among the healthy as among the unhealthy, here, fitness was equated to length of life

Educational psychology lays stress on something else—namely, scholastic fitness, that is, ability to do sums correctly, to remember large quantities of arbitrary facts, and to reason clearly in the abstract Personnel selectors lay stress on the desirability of emotional stability, freedom from anxiety, and facility in making personal contacts None of these ideas agree with what is meant by "fitness" in a biological sense, though such qualities as health, in particular, may be correlated with the biological requirements

What, then, constitutes biological fitness? Darwin emphasised survival, which is closely related to health, but in fact fertility matters most in evolution through natural selection, survival is a necessary but insufficient condition Net fertility can be measured by the number of offspring who reach the mean age at which the parent reproduced. Thus stillbirths and deaths in infancy do not enhance the fertility of the parent Since biological fitness and net fertility are synonymous, the unfit are, by definition, those who are unable to propagate efficiently

Eugenists have frequently pointed out that civilisation tends to preserve the unfit, but, unless children are born to those so preserved, there is no effect on posterity It is easy to quote instances in which medical science does actually alter fitness Sometimes it produces an increase —e g, when a juvenile diabetic is nurtured to an adult age or when a case of retinoblastoma is surgically cured At other times, as when we segregate a high grade defective or when a patient is sterilised, fitness is directly diminished by medical procedure in the interests of the individual's mental or physical health

As a consequence of our artifices, a general decline of physique and intelligence in civilised communities has been predicted Pearson (1912b) blamed both medical and social changes

> "We are already feeling the dearth of able men in all departments of activity We have now consciously to undertake the work of natural selection ourselves, for we have suspended Nature's effective but oft-times harsh methods of raising our stock We have to check the fertility of the unfit and encourage that of the fit

Others, with their eyes on statistics of differential birth rate have considered the problem to be of a more general character For example, Cattell (1937) wrote "Under every system of civilisation yet known, there has been an ineradicable tendency for the population to be recruited from the submen" The observations on which such arguments are based include a formidable array of facts Special attention has been drawn to these facts in recent years, but they do not necessarily concern new processes

Differential birth rate is a phenomenon commonly found when cultural or religious groups are compared More striking and regular are the economic gradations in family size, and of particular interest is the differential birth rate with respect to mental ability (Burt 1946, Thomson 1947) Also noticeable are the large family sizes found among the physically disabled—among those suffering from blindness, deafness, epilepsy, or rheumatism—though such data must be carefully corrected for selection of abnormally large sibships on account of affected cases (Jones 1934) In general, eugenic ideas have crystallised in the conception of the social-problem group, from which our high grade defective patients are drawn—a submerged tenth of the population, poverty-stricken, unhealthy, antisocial, and poorly endowed intellectually but with greatly increased fertility (Lidbetter 1933) It is often assumed that such a group could not exist except in a civilised society and that it is the product of too much social care Nothing could be more absurd, since the group is, by its nature and by definition, looked after inadequately

From the point of view of the biologist, this group is "fit" because it has a high fertility, though from the ordinary social point of view the members are "unfit" Actually, its separation from the rest of the community is arbitrary, and implies an assumption similar to that made a century ago by students of criminality and sponsored by Lombroso (1887) The subcultural, or social problem, human being has separate existence no more than the criminal type Poor physique, criminality, inferior intellectual stature, and low economic status can easily be shown to be correlated, but the causes of the associations are not simple (Goring 1913) We must beware of assuming that the social problem group exists because it has a name For the purpose of discussing biological fitness, however, it may be convenient to assume its existence even if this involves considerable over simplification

FERTILITY AND INTELLIGENCE

Lately much attention has been given to the problem of the general intelligence level in the population The relatively high fertility prevalent in the social problem group is thought to imply that its numbers will increase to the detriment of the rest of the community As I have previously often pointed out, such predictions are based upon particular assumptions about the genetical structure of the population, and there are important possibilities which have been overlooked To get a clear picture, we must first of all examine the relation of fertility to intelligence over the whole range of values—that is to say, from the most brilliant to the dullest, even including idiots

All investigators agree that the fertility of the most intelligent is low, and that, within most of the normal range, fertility rises steadily as intelligence quotient (I Q) falls Idiots, however, are infertile even if they survive infancy, so, at some point in the scale of I Q, fertility must reach a maximum The net fertility of persons with intellects of very low grade has not been at all fully investigated A good way of examining the problem would be to compare the intelligence distribution of the population at birth with the distribution of intelligence among the parents of every child born Parents of two children would be represented twice in the sample and parents of three children three times, and so on

* A paper read to the North West Metropolitan Regional Mental Deficiency Society on Feb 27, 1950

Mothercraft Exhibition

The 1950 mothercraft exhibition and conference is to be held at the Central Hall, Westminster, London, S W 1, from Nov 4 to 14

Air Disinfection and Sterilisation

A symposium on this subject will be held by the micro biological panel of the Society of Chemical Industry on Wednesday, Oct 11, at 3 P M at 11, Chandos Street, London, W 1 The speakers will include Dr R E O Williams and Dr R B Bourdillon

Royal Army Medical College

Lectures will be given at the college (entrance John Islip Street), London, S W 1, during this winter on Thursdays, at 5 P M They will be open without fee to both Service and civilian doctors Sir William MacArthur will give the first, on Oct 12, on the History of Smallpox in the British Isles Particulars of further lectures will be found in our weekly diary

British Journal of Ophthalmology and Ophthalmic Literature

The publication of this journal has been taken over by the British Medical Association The editor of the journal should be addressed at the Institute of Ophthalmology, Judd Street, London, W C 1

Dr J Greenwood Wilson will take office as chairman of the council of the Royal Sanitary Institute on Oct 1

From Sept 17 to Oct 5 Mr St J D Buxton is visiting Greece for the third time at the invitation of the Greek Recovery Programme Committee, to advise on the rehabilita tion of the wounded and civilians and the development of a national service for the care of cripples

Dame Katherine Watt, D B E, R R C chief nursing adviser to the Ministry of Health, is retiring at the end of this month Dame Katherine was matron in chief of Princess Mary's R A F Nursing Service before she joined the Ministry in 1939 as principal matron for the Emergency Medical Service She was appointed to her present post in 1948

Appointments

ANNING, S T, M D Camb M R C P asst dermatologist (con sultant) United Leeds Hospitals
BERTRAM D R F O B E, M B Durh, D.M.R consulting radiolo gist South Somerset clinical area
BOND S A M B Glasg M R C O G, F R C S consulting obstetrician and gynæcologist North Gloucestershire clinical area
BOYD, W H F M B Aberd, D A anæsthetist Bangour Hospital West Lothian
BROWN A S, M B Edin D A anæsthetist neurosurgical unit Royal Infirmary Edinburgh and Bangour Hospital West Lothian
CLARK ARNOLD, M D Lond M R C P chest physician, Dorset area
COOK J B M D Lond M R.C.P senior registrar, neurological department General Infirmary Leeds
CULLEN, S V M B Lpool school M O Isle of Man
DUNN, J H O B E, T D, M.D Belf M.R C.P, D P.H venereologist, West London Hospital
FETTES WILLIAM M B Aberd D P H tuberculosis physician, mainly Blackpool area
FORFAR J O M C, M B St And, M R C P M R C P F D C.H senior prædiatric physician, Edinburgh northern group of hospitals
LITTLE G M M B Camb, M R C.P asst. physician and deputy physician superintendent King George V Sanatorium Godalming
MACLEAN K S, M A M D Camb M R C P asst physician Guy's Hospital London
MALLESON JOAN M B Lond M O, contraceptive clinic University College Hospital
PRICHARD J S M C M A M B Camb M R C P neurologist Hospital for Sick Children Toronto Canada
REMINGTON HOBBS COURTENEY M R C.S D.L.O F R C.S ear nose and throat surgeon Winchester group of hospitals
TYRER F H M A Camb M.R C S D I H industrial M O West Midlands Gas Board

Appointed Factory Doctors

ANTHONY T J M B Wales Bridgend district Glamorgan
BAILEY J M, M B Glasg Lanchester district Durham
DOUGLAS C M L.R C P E Market Deeping district Northants
FAITH C N M D Lond D P H Paddington district London
GREEN E A M.A M B Camb Amersham No 1 district Bucks
GUTHRIE JAMES O B.E, M.B Edin Unst district, Shetland
ISBISTER WILLIAM M B Edin Stretford district, Manchester
McGUFFIE S.M.G M B St And Grange-over Sands district Lancs
PRITCHARD WYNNE M.B Lpool Festiniog district Merioneth
WATT GEORGE M B Edin Langholm district Dumfries
WILTON, B J, M R C S Holborn district London

Births, Marriages, and Deaths

BIRTHS

ARMSTRONG —On Sept 9 at Rothbury, Northumberland the wife of Dr Reginald Armstrong O B E —a daughter
BINGHAM —On Sept 4, at Northampton, the wife of Dr W G A Bingham—a daughter
BOWER.—On Sept 11, in Birmingham the wife of Captain B D Bower R A M C —a daughter
BROCK —On Aug 26, in London, the wife of Dr Bevis Brock —a daughter
DARKE —On Aug 17, in Sheffield, the wife of Dr Christopher Darke—a daughter
GIBB —On Sept 5 in Manchester the wife of Dr Robert Gibb—a daughter
KERR —On Sept 9 in London the wife of Dr D S Kerr—a daughter
MAY —On Sept 13 the wife of Dr C R May—a son
MAYON WHITE —On Sept 8, at Ipswich the wife of Dr Richard Mayon White—a daughter
RAWLINGS —On Aug 16 the wife of Dr Peter Rawlings—a son
SYMON —On Sept 11 at Ipswich the wife of Dr Hugh Symon—a son
WALSH —On Sept 3 the wife of Mr R J Walsh M R.C.S —a son
WEST —On Sept. 11, at Cleethorpes, the wife of Dr M H West—a daughter
WINNER —On Sept. 6, in London the wife of Dr H I Winner—a son
WRIGHT —On Aug 18 at Bournemouth the wife of Dr G A Wright—a son

MARRIAGES

CLARKE—WAUGH —On Sept 5, at York, Patrick Clarke, F R C.S to Catherine Waugh
DALES—POPE —On Sept 5 in Belfast Herbert Calvert Dales F R C.S to Frances Audrey Pope M B
DONALDSON—WILSON —On Sept 2 in Newcastle upon Tyne Richard Gordon Donaldson M R.C S to Ann Kenya Wilson M B
KAY—POWLETT —On Sept 9 in London Humphrey Edward Melville Kay M D to April Grace Lavinia Powlett
KEARNEY—KINMONTH —On Sept. 6 in London Kevin Victor Kearney M B to Ann Kinmonth
MOLLOY—MILLETT —On Aug 8 at Canterbury John Molloy to Joan Millett M B
SHEMILT—BROWNSCOMBE —On Sept. 25 at Watchet, Philip Shemilt F R C.S to Janet Brownscombe
SLACK—ORME —On Aug 21 Walter Kenneth Slack M R C.S to Sylvia Gwendoleno Orme S R N
SLESS—LEVY —On Aug 21 in Manchester, Herzl Sless M.B, to Ruth Levy
STAMMERS—TOZER —On Sept 2 Donald John Stammers to Rita Doreen Clarissa Tozer M B
SWERDLOW—LESSOF —On Aug 27 in London Mark Swerdlow M B to Elizabeth Lessof, B.SC

DEATHS

AGNEW —On Aug 30, at Reading Henry Murray Agnew, L.R.C P E D P H
BUSHE —On Aug 19 at Winchester Charles Kendal Bushe O B.E M D Dubl, surgeon rear admiral R.N retd
CARRUTHERS —On Sept 12 at Wymondham Norfolk, Norman Stuart Carruthers F R C.S E D L.O aged 63
COBBLEDICK —On Aug 20, at Coulsdon, Surrey, Arthur Stanbury Cobbledick M D Lond, aged 79
CROOKS —On Aug 31 at Nottingham Frederick Crooks M B, M CH Belf F R C.S E aged 63
CROSTHWAIT —On Sept 11, at Brighton William Sylvester Crosthwait, L.R C P I
FLETCHER —On Sept 9 at Petworth Sussex, Herbert Morley Fletcher M A M D Camb F.R C P aged 85
GRAHAM SMITH —On Aug 30 at Cambridge George Stuart Graham Smith M A, M D Camb F R.S, aged 75
HILLIER —On Aug 18 in Birmingham, William Thomas Hillier, M R C.S D P H aged 74
HUDSON —On Aug 26 at Rochester, Kent, Osborne Henderson Hudson M.R C S aged 90
KIRWAN —On Aug 29, at Croydon John Francis Kirwan M B N U.I
LOW —On Aug 24, at Tunbridge Wells, Percy Charles Low, M B Camb aged 88
LYONS —On Sept 1, Harold Michael Lyons M R C.S
MACPHERSON —On Sept 3 Angus Duncan Macpherson M.A M B Edin
MILLIGAN —On Aug 25 in London Wyndham Anstruther Milligan M D Aberd F R C.S E, aged 78
MILTON —On Aug 29, in London Edward Farminer Milton M.D Lond, aged 68
OGLE SKAN —On Sept. 11 Henry William Ogle Skan M R C.S, aged 67
POTT —On Sept 7 at Upham Hants Francis Henry Pott M R.C S aged 89
REID —On Aug 19 in Edinburgh Alexander Christie Reid M.A B.SC M.D Aberd DIP OPHTH Oxfd aged 73
RIVAZ.—On Sept 3 Percy Montgomery Rivaz M D Durh D P H surgeon captain R.N retd
ROBINSON —On Aug 19 at Royston Herts George Henkell Drummond Robinson M D Lond F R C P aged 85
SUTTON —On Sept 10 in London Harold John Vane Sutton M R C.S aged 54
TUCKER —On Sept 2 at Carshalton William Marwood Tucker B M Oxfd aged 33
TWORT —On Aug 21 in London Charles Claud Twort M D Aberd
WIGHT —On Aug 26 at Wangford Beccles Suffolk Cecil Harold Wight M C M R.C.S
WOODCOCK —On Sept 5 in Leeds Herbert De Carle Woodcock M D Durh F R C.P E, D P H aged 89

PROPAGATION OF THE UNFIT*

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All investigators agree that the fertility of the most intelligent is low, and that, within most of the normal range, fertility rises steadily as intelligence quotient (I Q) falls Idiots, however, are infertile even if they survive infancy, so, at some point in the scale of I.Q., fertility must reach a maximum The net fertility of persons with intellects of very low grade has not been at all fully investigated. A good way of examining the problem would be to compare the intelligence distribution of the population at birth with the distribution of intelligence among the parents of every child born Parents of two children would be represented twice in the sample and parents of three children three times and so on

* A paper read to the North West Metropolitan Regional Mental Deficiency Society, on Feb 27 1950

The result of such a survey would reveal the representation of each level in the parental generation and enable relative fertility to be directly calculated A near approach to data of this kind can be obtained by comparing the parents and sibs of the defectives surveyed at Colchester (Penrose 1938) This population, on which the figures in table I are based, is selected by the presence of at least one mentally defective child in each sibship, but it is useful for demonstration purposes Estimates of the relative fertility are probably quite good for the lower levels of I Q but would be inaccurate at the upper levels, which are not well represented in the sample It is immediately apparent that, for both sexes, there is a maximal fertility at some point between I Q 50 and I Q 100 Furthermore, the females and males differ strongly in this respect Feeble minded females are far more biologically fit than feeble minded males—i e, about three times as fertile The same is true for imbeciles, and this method of demonstration agrees with what is known from direct observation Idiots of both sexes are completely infertile

The problem of segregating a patient because of the danger of offspring arises far more often with females than with males There are even records of female phenylketonurics and mongols having had offspring, but no such examples in males This may be partly due to the difficulty of knowing when a male imbecile has had a child, but the sex difference is probably real Mating with respect to I Q is highly assortative, in that the intelligent and the unintelligent do not mix as much as would be expected by chance The assortation, however, is asymmetrical because matings between the intelligent male and the unintelligent female are much commoner than those of the reverse type This is probably a constant sociobiological fact

The remarkable feature, shown in table I, that the relative fertility at both the extremes is reduced, can be expressed by saying that the range of variation with respect to intelligence is greater in the offspring than in the parents Variation expressed as standard deviation is shown, in table II, to be 17 64 I Q points for all offspring and only 13 71 for all parents A similar effect is shown

TABLE I—PERCENTAGE DISTRIBUTIONS OF PARENTS AND SIBS OF CERTIFIED CASES OF MENTAL DEFECT

I Q	Fathers (1214)	Sons (2357)	Fertility*	Mothers (1251)	Daughters (2288)	Fertility*
122	0 7	1 4	0 50	0 2	1 6	0 13
100	83 0	79 4	1 04	72 0	77 5	0 93
78	12 3	9 7	1 27	16 2	11 6	1 38
56	3 9	6 1	0 64	11 4	5 6	2 04
34	0 1	2 3	0 04	0 2	2 7	0 09
12	0 0	1 1	0 00	0 0	1 0	0 00
Total	100 0	100 0	1 00	100 0	100 0	1 00

* Fertility = relative fertility (% parents/% children)

in the analysis of some metrical physical characters For example, the calculations of Pearson and Lee (1896) show that stature is slightly more variable in offspring than in parents Cephalic index shows the same peculiarity quite strongly, both in the material analysed by Pearson and Fawcett (1898) and (according to calculations made recently in the Galton Laboratory) in the extensive data of Frets (1924) The mean values for parents and offspring differ slightly, but this does not necessarily imply that the population mean is gradually shifting The difference could be caused by recessivity of some of the genes involved Thus, the slightly lower mean I Q in children compared with their parents could be due to recessive types of imbecility and idiocy, many of which are actually known to exist

In general, a greater variance in each generation of offspring as compared with parents indicates that the population is being replenished from the middle of

TABLE II—MEANS AND STANDARD DEVIATIONS IN PARENTS AND OFFSPRING

—	Intelligence (I Q) (from table I)		Cephalic index (%) (Frets 1924)	
	Mean	S D	Mean	S D
Parents	93 45	13 71	80 10	3 01
Offspring	92 84	17 64	80 80	3 29

S D = standard deviation

the range If the hereditary factors which contribute to the variation are mainly additive, the central part of the distribution must be, on the whole, heterozygous for the genes concerned, whereas the extremes are homozygous Thus, the population is being bred chiefly from heterozygotes Biologically, a population propagated in this way has certain advantages Variability is permanently retained and the genic equilibrium is stable The relative infertility of those who have very high intelligence is compensated biologically by the complete infertility of those of the lowest intellectual levels, and a progressive decline in the average level is not to be expected Both ends of the scale are replenished by a fertile intermediate group

CAUSES AND EFFECTS OF DIFFERENTIAL FERTILITY

The causes of differential fertility with respect to intelligence are not altogether clear at the present time They are partly physiological and partly psychological It is believed that there are many environmental factors which influence fertility, such as malnutrition (Swyer 1948) and disease Apart from these influences, there are likely to be inborn differences in potential fertility, which are expressed sometimes in structure and sometimes in reaction patterns The comparative infertility of men of genius, which was noted by Galton (1869), may be mainly a psychological phenomenon like the celibacy of the learned in the Middle Ages Demographers of the present day have stressed the cultural origins of differential fertility, which again implies a psychological origin Cultural habits, also, tend to reduce the fertility of highly intellectual women even more than that of men of similar level It is also worthy of note that the risks of maternity are greater, as judged by mortality statistics, for the women of the most favoured social classes—who may have been regarded as especially well endowed intellectually—than for women of the least favoured social groups At the lower end of the scale, the infertility of imbeciles is largely due to psychological causes The evidence for physiological sexual incapacity in low grade defectives is surprisingly small Among females of medium and high grades, investigations on the menstrual function have shown little if any deviation from the normal (Danenhower 1948)

It may be, I think, not unreasonably concluded that the system of differential fertility found in civilised populations is a naturally balanced one and that there is no need to fear the effects of high fertility in the lower social and intellectual groups In so far as intelligence is environmentally determined, the mental level of the parents is biologically immaterial in the long run, though, for the immediate offspring, environment simulating heredity may depend on the parents' intelligence

Thus it seems to follow that, whether we regard intelligence as inherited or environmentally determined, the judgment of suitability of an individual for parenthood should be based frankly upon social rather than upon genetical considerations If the patient is biologically fit, his or her children will take their places in the genetical equilibrium of the whole population It may however be desirable on clinical or social grounds

to restrict such a person's offspring, that is to say, parenthood, in a given case, might cause mental breakdown of the patient or alternatively produce an unhealthy environment for the child. These are problems which are concrete and within the scope of clinical and social medicine If judgment is based on these grounds, no eugenical harm will be done and uncertainties inherent in making genetical estimates will be avoided

The principle recommended here is parallel to one of the suggestions in the Brock report (1934)—namely, that defectives who are totally unfitted for parenthood should, in their own interests, be enabled to escape from a burden they have every reason to dread But in other respects the views expressed here differ from those expressed in the Brock report, for I do not think that the "mass of defectives and subnormals" is steadily growing The genetical constitution of future generations is not, I believe, likely to be jeopardised by allowing fertile high-grade defectives to have offspring Propagation of the unfit is not a danger to the community, because the unfit are those who cannot propagate

SUMMARY

Decisions about segregation or otherwise of high grade patients should be based solely on medical, psychological, and social grounds and the future population can be trusted to retain its equilibrium with respect both to biological fitness and intelligence level

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POTENTIATION OF SULPHONAMIDE BY "L SUBSTANCE"

JOSEPH W BIGGER
M.D, Sc.D Dubl., F.R C P F.R C.P.I., D.P.H
PROFESSOR OF BACTERIOLOGY AND PREVENTIVE MEDICINE IN THE UNIVERSITY OF DUBLIN

GEORGE C WARE
B.A Dubl.
From the Department of Bacteriology Trinity College Dublin

THE action of sulphathiazole on *Bacterium coli* in fluid culture media was studied in connection with an investigation of the synergism and antagonism of certain antibacterial substances (Bigger 1950) In the course of the work a hitherto undescribed phenomenon was encountered which is now reported here

TECHNIQUE

A single strain of *Bact coli* was used throughout the research.

Sulphathiazole (M & B) was dissolved in distilled water with the aid of sodium hydroxide to make a 5% stock solution of pH 10 0 which was sterilised by boiling Enough of the stock solution was then added to a fluid culture medium in screw top bottles to produce the required concentration of sulphathiazole The pH was adjusted to 7 5, and the medium was sterilised in boiling water for 15 minutes, after which the pH was tested and if necessary readjusted to 7 5 The highest concentration of sulphathiazole attainable without risk of precipitation was somewhat below 300 mg per 100 ml The highest concentration used was 256 mg per 100 ml

TABLE I—ACTION OF SULPHATHIAZOLE AGAINST *Bact coli* IN PLAIN BROTH AND IN BROTH TREATED BY METHOD OF HARPER AND CAWSTON

Concentration of sulphathiazole (mg per 100 ml.)	No of bacteria per loop	
	Plain broth	Treated broth
256	51	0
128	120	0
64	TT	0
32	TT	42
16	TT	—
8	TT	— —
4	TT	T
2	TT	TT

Initial count 1
Incubation 46 hours

Sulphathiazole solutions in a culture medium were serially diluted in 5 ml volumes of the same medium in small bottles covered with loosely fitting aluminium caps The bottles were inoculated by adding to each one drop from a Dreyer pipette of a suitable dilution of a 24-hour culture of the organism grown in a fluid medium The bottles were incubated at 37°C and examined daily for two or three days The naked eye appearance of the medium was recorded as C (clear), T (slight to moderate turbidity), or TT (well marked to full turbidity)

A 5 mm loopful from each culture which had remained clear was spread over the surface of a well-dried agar slope containing 0 5% *p* aminobenzoic acid to prevent the sulphathiazole from interfering with the growth of organisms The slopes were incubated and the resulting colonies counted It was possible to count up to several hundred colonies on a slope with reasonable accuracy When the number was too great to be counted the growth was recorded as — (colonies uncountable) or —+ (confluent growth)

ACTION OF SULPHATHIAZOLE IN BROTH

The well known sulphonamide antagonising action of broth rendered it unsuitable as a culture medium for this research Treatment by the method of Harper and Cawston (1945) decreased, but did not abolish, this property, and, in our hands, did not give uniform results with different batches of broth and of horse blood

Table I compares the results obtained in a parallel titration of sulphathiazole acting against *Bact coli* in plain broth and in broth treated by the method of Harper and Cawston In plain broth sulphathiazole displayed merely a bacteriofremic—i e., growth restraining (Bigger 1950)—action against the organism in the highest concentrations tested and no apparent action in concentrations of 64 mg per 100 ml and lower In treated broth one-loop sterility was yielded by concentrations of sulphathiazole of 64 mg per 100 ml. and higher and a bacteriofremic effect was obtained with concentrations as low as 4 mg per 100 ml.

ACTION OF SULPHATHIAZOLE IN SYNTHETIC MEDIA

Bact coli was selected as the test organism because it grows well in simple synthetic media which are less actively sulphonamide antagonising than broth The first medium tried was one whose formula is given by Gale (1947) In this medium sulphathiazole displayed both bactericidal and bacteriofremic properties in very

The result of such a survey would reveal the representation of each level in the parental generation and enable relative fertility to be directly calculated A near approach to data of this kind can be obtained by comparing the parents and sibs of the defectives surveyed at Colchester (Penrose 1938) This population, on which the figures in table I are based, is selected by the presence of at least one mentally defective child in each sibship, but it is useful for demonstration purposes Estimates of the relative fertility are probably quite good for the lower levels of I Q but would be inaccurate at the upper levels, which are not well represented in the sample It is immediately apparent that, for both sexes, there is a maximal fertility at some point between I Q 50 and I Q 100 Furthermore, the females and males differ strongly in this respect Feeble minded females are far more biologically fit than feeble minded males—i e, about three times as fertile The same is true for imbeciles, and this method of demonstration agrees with what is known from direct observation Idiots of both sexes are completely infertile

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Total	100 0	100 0	1 00	100 0	100 0	1 00

* Fertility = relative fertility (% parents/% children)

in the analysis of some metrical physical characters For example, the calculations of Pearson and Lee (1896) show that stature is slightly more variable in offspring than in parents Cephalic index shows the same peculiarity quite strongly, both in the material analysed by Pearson and Fawcett (1898) and (according to calculations made recently in the Galton Laboratory) in the extensive data of Frets (1924) The mean values for parents and offspring differ slightly, but this does not necessarily imply that the population mean is gradually shifting The difference could be caused by recessivity of some of the genes involved Thus, the slightly lower mean I Q in children compared with their parents could be due to recessive types of imbecility and idiocy, many of which are actually known to exist

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the range If the hereditary factors which contribute to the variation are mainly additive, the central part of the distribution must be, on the whole, heterozygous for the genes concerned, whereas the extremes are homozygous Thus, the population is being bred chiefly from heterozygotes Biologically, a population propagated in this way has certain advantages Variability is permanently retained and the genic equilibrium is stable The relative infertility of those who have very high intelligence is compensated biologically by the complete infertility of those of the lowest intellectual levels, and a progressive decline in the average level is not to be expected Both ends of the scale are replenished by a fertile intermediate group

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INVESTIGATION

Effect of Broth

Sulphathiazole was titrated in S M in duplicate To the bottles in one set (containing 5 ml of S M.) a drop of broth was added, so giving approximately 1% broth, to those in the other set no broth was added Both sets were inoculated with a dilution of a culture of the organism in saline solution The results are given in table III In the series without broth there was no paradoxical result, and turbidity first appeared in the bottle containing $^1/_{32}$ mg of sulphathiazole per 100 ml. In the series to which broth had been added a paradoxical result was given by the first and second bottles, and turbidity developed in the bottle containing 1 mg sulphathiazole per 100 ml

Effects of Lemco and Peptone

Since the broth had been prepared from 'Lab-Lemco' and Parke Davis peptone, the next step was to investigate the effects of lemco and peptone separately and together Table IV shows the results obtained in the crucial experiment of the research Sulphathiazole was titrated against *Bact coli* in S M alone and in S.M to which had been added 1 5000 peptone, 1 5000 lemco, and 1 5000 peptone plus 1 5000 lemco No concentration of

TABLE III—EFFECT OF BROTH ON ACTION OF SULPHATHIAZOLE ON *Bact coli*

Concentration of sulphathiazole (mg per 100 ml.)	No of bacteria per loop	
	S.M	S.M. +1% broth
256	0	++
128	3	40
64	3	20
32	5	16
16	7	16
8	5	15
4	6	20
2	10	40
1	20	T
$^1/_8$	45	T
$^1/_4$	95	T
$^1/_8$	150	TT
$^1/_{16}$	200	TT
$^1/_{32}$	T	TT

Initial count 36
Incubation 48 hours

sulphathiazole tested in S M alone reduced the one loop count to zero in 48 hours, whereas in the presence of peptone the counts were considerably higher, and the presence of lemco yielded zero counts with each concentration of sulphathiazole tested When both peptone and lemco were present, lemco seemed to neutralise considerably the antagonising action of peptone on sulphathiazole in concentrations ranging from 64 to 4 mg per 100 ml. The most striking finding in this experiment was the acceleration in the rate of death of the bacteria in the presence of lab lemco

Table V gives a more complete comparison of the effects of sulphathiazole on *Bact coli* in S.M alone and with the addition of 1 20,000 lab lemco (L.S M)

In some comparisons of S M and L S M the presence of lemco slightly extended the power of sulphathiazole to prevent the development of turbidity, but the most constant result of the presence of lemco was great acceleration of the rate of death of the bacteria in the presence of sulphathiazole "L effect" has been adopted as a convenient name for this property of lemco, and 'L substance" for the constituent of lemco responsible for the effect

We have already expressed some doubt as to whether, when acting in S.M, sulphathiazole could properly be described as bactericidal In the presence of lemco, however it certainly is bactericidal. Since lemco is not an antibacterial substance, the term "synergistic"

TABLE IV—EFFECTS OF LEMCO AND PEPTONE ON ACTION OF SULPHATHIAZOLE AGAINST *Bact coli*

Concentration of sulphathiazole (mg per 100 ml)	No of bacteria per loop in S.M			
	Without lemco or peptone	+1 5000 peptone	+1 5000 lemco	+1 5000 peptone and 1 5000 lemco
256	22	250	0	+
64	23	++	0	62
16	25	++	0	24
4	17	++	0	18
1	60	++	0	++
0	TT	TT	TT	TT

Initial count 30
Incubation 48 hours

cannot be applied to it in relation to sulphathiazole if we accept the definition adopted by Bigger (1950) We suggest "potentiation" as more appropriate, for lemco certainly gives power to sulphathiazole—power to kill rather than to restrain the multiplication of bacteria

The L effect was demonstrated in lemco over a wide range of concentrations The lowest effective concentration varied with different batches of lemco and, to some extent, from experiment to experiment performed with the same batch In many experiments lemco was still active as a potentiator of sulphathiazole when present in S M in a concentration of 1 120,000 When lemco was present in high concentrations—e g, 1 100 and occasionally even 1 1000—it did not accelerate the rate of killing of bacteria and seemed to act antagonistically to sulphathiazole This is attributed to the presence in lemco of sulphonamide antagonising substances which are diluted to below their effective concentration earlier than the L substance For this and other reasons a concentration of 1 part of lab lemco to 20,000 parts of S M was considered optimal, and this concentration was invariably used in making L S.M

Test for L effect

The next step was to determine whether the L effect could be demonstrated in substances other than lab lemco A satisfactory technique for the purpose was devised and was used in all such tests. The substance under test was serially diluted in S M containing 16 mg of sulphathiazole per 100 ml. The controls consisted of three bottles containing 16 mg of sulphathiazole per 100 ml in S M and three containing the same concentration of sulphathiazole in L S M All were inoculated, incubated, and tested in the usual way The criterion on which reliance was placed for determining whether a substance in a particular concentration displayed the

TABLE V—EFFECT OF LEMCO ON ACTION OF SULPHATHIAZOLE AGAINST *Bact coli*

Concentration of sulphathiazole (mg per 100 ml)	No of bacteria per loop in S.M	
	Without lemco	+1 20 000 lemco
256	2	0
128	18	0
64	24	0
32	23	0
16	13	0
8	18	0
4	16	0
2	60	3
1	70	4
$^1/_2$	100	35
$^1/_4$	+	+
$^1/_8$	+	+
$^1/_{16}$	++	+
$^1/_{32}$	TT	TT
0	TT	TT

Initial count 16
Incubation 44 hours

much lower concentrations than it did in Harper and Cawston broth

In the earlier experiments the cultures for inoculation were grown in broth Later, since it was considered that some error might be introduced by transferring bacteria from broth to a synthetic medium which, obviously, calls into play a variety of enzymes not required in broth, they were grown in synthetic medium We were long harassed by uncertainty as to the number of bacteria in the inoculum We always added one drop of what was considered a suitable dilution of the culture in synthetic medium to each 5 ml. of the test fluid, and hoped that this fluid would then contain such a number of bacteria as to yield about 25 colonies from one 5 mm loopful Over some months this aim was rarely achieved The addition to 5 ml of culture medium of one drop of a 1 2000 dilution of an approximately 24 hour culture in Gale's medium of the same strain of *Bact coli* yielded 2–75 colonies per loop Several experiments had to be abandoned because the inoculum had contained either too many or too few living bacteria After much time had been wasted, we began to suspect that Gale's medium was not so suitable for our purpose as we had thought Investigation showed that, if the period of incubation was not more than 18–20 hours, it was possible to predict with considerable accuracy the number of living bacteria present, but, if incubation was longer, the number of living bacteria fell rapidly This was due to the development of such a high degree of acidity as to cause the death of most of the bacteria present A pH as low as 4 7 was found in a 26 hour culture, and at this pH *Bact coli* dies rapidly The low pH attained was due to an excess of glucose and a deficiency of phosphates in the medium

Ultimately a medium with the following formula was adopted and used throughout the rest of the investigation

Synthetic Medium (S M)

Glucose	3 0 g
Ammonium hydrogen phosphate ($(NH_4)_2HPO_4 2H_2O$)	5 0 g
Sodium chloride (NaCl)	1 0 g
Ferrous sulphate ($FeSO_4 7H_2O$)	0 3 g
Magnesium sulphate ($MgSO_4 7H_2O$)	0 7 g
Potassium hydrogen phosphate (KH_2PO_4)	0 5 g
Potassium hydrogen phosphate (K_2HPO_4)	5 0 g
Water to	1000 ml

pH adjusted to 7 5

The pH of a culture of *Bact coli* in this medium after 30 hours' incubation was 6 6, which is not rapidly lethal to the organism

As a result of the precipitation of phosphates during sterilisation by heat, the concentrations of iron, magnesium, and phosphate in the medium used are considerably lower than stated in the formula The medium could be improved, and the necessity for filtration almost or completely avoided, by a great reduction in the concentrations of ferrous and magnesium sulphates, but, as this was not investigated until much of the work had been done, the formula given was used throughout

Table II shows the mean of the figures obtained in four parallel titrations of sulphathiazole against *Bact coli* in S M Turbidity did not appear until the concentration of sulphathiazole had been reduced to $^1/_2$ mg per 100 ml, which contrasts with turbidity in the presence of 4 mg sulphathiazole per 100 ml in Harper and Cawston broth *Bact coli* is very sensitive to sulphathiazole when no antagonising substances are present

Attention is directed particularly to two points First, not even the highest concentration of sulphathiazole yielded a zero count per loopful in 48 hours The time

TABLE II—ACTION OF SULPHATHIAZOLE AGAINST *Bact coli* IN S M

Concentration of sulphathiazole (mg per 100 ml)	No of bacteria per loop	
	48 hours	144 hours
256	110	0
128	47	0
64	38	0
32	14	0
16	21	0
8	31	0
4	51	0
2	57	0
1	92	0
$^1/_2$	120	0
$^1/_4$	170	0
$^1/_8$	+	+ +
$^1/_{16}$	+ +	+ +
$^1/_{32}$	T	TT
$^1/_{64}$	TT	TT

Initial count 54

required to produce zero counts varied greatly in different experiments They were never obtained in S M in 24 hours, and very rarely in 48 hours When incubation was greatly prolonged, zero counts were normally obtained with all concentrations down to $^1/_4$ mg per 100 ml In view of the long period required to reduce the bacterial population to zero, we are entitled to doubt if sulphathiazole is to be regarded as a bactericidal substance It might be thought, rather fancifully perhaps, that the bacteria, tired of their struggle against the bacteriofremic influence of sulphathiazole, had died, rather than that they had been killed by the substance The second point to which attention is called is that the 48 hour count with the highest concentration of sulphathiazole was higher than with lower concentrations This paradoxical result has appeared so frequently, although not constantly, that it must be accepted as valid

EFFECT OF DILUENT

So far no mention has been made of the fluid used for diluting a culture of the organism intended for inoculation In the earlier part of the investigation this was physiological saline solution to which a "little" broth had been added Such an unscientific terminology is used deliberately because the addition was made casually by pouring some broth into a tube containing sterile saline In most cases the proportion of broth to saline probably lay between 1 5 and 1 10 Broth saline was used instead of plain saline because, many years ago, working with *Staph pyogenes*, one of us (J W B) found that, if a culture of that organism was diluted in plain saline solution, the bacteria died quite rapidly, whereas their numbers remained constant for a long time if they were diluted in saline solution containing broth Since then the practice of diluting cultures in broth saline has been adopted almost automatically

One day one of us and a colleague independently made titrations of sulphathiazole in S M The same solution of sulphathiazole, the same batch of S M, and the same culture were used, and the work was done at about the same time The first bottle in the series to show turbidity was that containing $^1/_4$ mg of sulphathiazole per 100 ml in one titration, and that containing $^1/_{32}$ mg of sulphathiazole per 100 ml in the second titration Such a degree of disparity could not fail to be distasteful to workers who take pride in their technique, and so the technical details were fully discussed As a result only one possibly significant difference was discovered the worker who obtained the higher titre, not having experienced the lethal effect of plain saline on bacterial suspensions, had used plain saline as diluent whereas the other worker had used broth saline It therefore seemed advisable to investigate the effect of the addition of broth to S M

INVESTIGATION

Effect of Broth

Sulphathiazole was titrated in S M in duplicate To the bottles in one set (containing 5 ml of S.M) a drop of broth was added, so giving approximately 1% broth, to those in the other set no broth was added Both sets were inoculated with a dilution of a culture of the organism in saline solution The results are given in table III In the series without broth there was no paradoxical result, and turbidity first appeared in the bottle containing $^1/_{32}$ mg of sulphathiazole per 100 ml. In the series to which broth had been added a paradoxical result was given by the first and second bottles, and turbidity developed in the bottle containing 1 mg sulphathiazole per 100 ml

Effects of Lemco and Peptone

Since the broth had been prepared from 'Lab-Lemco' and Parke Davis peptone, the next step was to investigate the effects of lemco and peptone separately and together Table IV shows the results obtained in the crucial experiment of the research Sulphathiazole was titrated against *Bact coli* in S M. alone and in S M to which had been added 1 5000 peptone, 1 5000 lemco, and 1 5000 peptone plus 1 5000 lemco No concentration of

TABLE III—EFFECT OF BROTH ON ACTION OF SULPHATHIAZOLE ON *Bact coli*

Concentration of sulphathiazole (mg per 100 ml.)	No of bacteria per loop	
	S.M	S.M. +1% broth
256	0	++
128	3	40
64	3	20
32	5	16
16	7	16
8	5	15
4	6	20
2	10	40
1	20	T
$^1/_8$	45	T
$^1/_4$	95	T
$^1/_8$	150	TT
$^1/_{16}$	200	TT
$^1/_{32}$	T	TT

Initial count 36
Incubation 48 hours

sulphathiazole tested in S M alone reduced the one loop count to zero in 48 hours, whereas in the presence of peptone the counts were considerably higher, and the presence of lemco yielded zero counts with each concentration of sulphathiazole tested. When both peptone and lemco were present, lemco seemed to neutralise considerably the antagonising action of peptone on sulphathiazole in concentrations ranging from 64 to 4 mg per 100 ml. The most striking finding in this experiment was the acceleration in the rate of death of the bacteria in the presence of lab lemco

Table V gives a more complete comparison of the effects of sulphathiazole on *Bact coli* in S.M alone and with the addition of 1 20,000 lab lemco (L.S M)

In some comparisons of S M and L.S.M the presence of lemco slightly extended the power of sulphathiazole to prevent the development of turbidity, but the most constant result of the presence of lemco was great acceleration of the rate of death of the bacteria in the presence of sulphathiazole 'L effect' has been adopted as a convenient name for this property of lemco and L substance" for the constituent of lemco responsible for the effect

We have already expressed some doubt as to whether, when acting in S M, sulphathiazole could properly be described as bactericidal. In the presence of lemco, however it certainly is bactericidal. Since lemco is not an antibacterial substance, the term 'synergistic"

TABLE IV—EFFECTS OF LEMCO AND PEPTONE ON ACTION OF SULPHATHIAZOLE AGAINST *Bact coli*

Concentration of sulphathiazole (mg per 100 ml)	No of bacteria per loop in S.M			
	Without lemco or peptone	+1 5000 peptone	+1 5000 lemco	+1 5000 peptone and 1 5000 lemco
256	22	250	0	+
64	23	++	0	62
16	25	++	0	24
4	17	++	0	18
1	60	++	0	++
0	TT	TT	TT	TT

Initial count 30
Incubation 48 hours

cannot be applied to it in relation to sulphathiazole if we accept the definition adopted by Bigger (1950) We suggest 'potentiation" as more appropriate, for lemco certainly gives power to sulphathiazole—power to kill rather than to restrain the multiplication of bacteria

The L effect was demonstrated in lemco over a wide range of concentrations The lowest effective concentration varied with different batches of lemco and, to some extent, from experiment to experiment performed with the same batch In many experiments lemco was still active as a potentiator of sulphathiazole when present in S M in a concentration of 1 120,000 When lemco was present in high concentrations—e.g , 1 100 and occasionally even 1 1000—it did not accelerate the rate of killing of bacteria and seemed to act antagonistically to sulphathiazole. This is attributed to the presence in lemco of sulphonamide antagonising substances which are diluted to below their effective concentration earlier than the L substance For this and other reasons a concentration of 1 part of lab lemco to 20,000 parts of S M was considered optimal and this concentration was invariably used in making L.S.M..

Test for L effect

The next step was to determine whether the L effect could be demonstrated in substances other than lab-lemco A satisfactory technique for the purpose was devised and was used in all such tests. The substance under test was serially diluted in S M containing 16 mg of sulphathiazole per 100 ml. The controls consisted of three bottles containing 16 mg of sulphathiazole per 100 ml in S M and three containing the same concentration of sulphathiazole in L.S M All were inoculated, incubated, and tested in the usual way The criterion on which reliance was placed for determining whether a substance in a particular concentration displayed the

TABLE V—EFFECT OF LEMCO ON ACTION OF SULPHATHIAZOLE AGAINST *Bact coli*

Concentration of sulphathiazole (mg per 100 ml.)	No of bacteria per loop in S.M.	
	Without lemco	+1 20 000 lemco
256	2	0
128	18	0
64	24	0
32	23	0
16	13	0
8	18	0
4	16	0
2	60	3
1	70	4
$^1/_8$	100	35
$^1/_4$	+	+
$^1/_8$	+	+
$^1/_{16}$	++	+
$^1/_{32}$	TT	TT
0	TT	TT

Initial count 16
Incubation 44 hours

TABLE VI—L EFFECT OF BRAND'S ESSENCE

Concentration of Brand s essence in S.M containing 16 mg of sulpha thiazole per 100 ml	No of bacteria per loop
1 100	0
1 200	0
1 400	0
1 800	0
1 1600	0
1 3200	0
1 6400	90
1 12,800	82
1 25 600	130
S.M containing 16 mg of sulpha thiazole per 100 ml	
1	95
2	130
3	110
L.S.M containing 16 mg of sulpha thiazole per 100 ml	
1	0
2	0
3	0

Initial count 22
Incubation 47 hours

L effect was that it should give a zero colony count, while the counts given by the controls containing sulpha thiazole in S M were not less than the initial count The period of incubation was 30–48 hours If the period was too short (e g , 24 hours), the L S M controls did not always give zero counts , if too long (e g , over 48 hours) some of the S M controls did occasionally give zero counts Table VI, which gives the results obtained in testing 'Brand's Essence' for L effect, illustrates the method The controls, which show high counts in S M and zero counts in L S M , being satisfactory, we may conclude that Brand's essence displayed the L effect in dilutions up to 1 3200

Effect of Other Substances

The L effect was demonstrated by this method not only by lab lemco and Brand's essence but also by other commercial meat extracts ('Lemco,' 'Oxo,' and 'Erinox'), by infusions of beef, 'Difco' dehydrated beef and horseflesh, by commercial yeast extracts ('Marmite' and 'Gye'), by human serum and urine, and by hæmolysed red blood cells Of these, gye (Guinness's yeast extract) was the most potent, showing in some experiments the L effect in a dilution of 1 320,000 The range displayed by different samples of human serum was from 1 1000 to 1 2000, and of human urine from 1 2000 to 1 6000 Hæmolysed human red blood-cells showed the L effect up to a dilution of 1 800, and horse red blood cells at 1 50, but not at 1 100 In the case of blood cells the titre is expressed in terms of packed cells All the substances mentioned had been exposed to a temperature of at least 100°C for not less than 15 minutes before being tested

Effect on Other Sulphonamides

The L effect was studied almost entirely in connection with sulphathiazole, but sufficient work was done to establish that it operated similarly in the case of other sulphonamides, including sulphanilamide, sulphapyridine, sulphaguanidine, sulphadiazine, sulphamerazine, and phthalylsulphathiazole and (to a lower extent) succinyl sulphathiazole

Effect on Other Antibacterial Substances

The addition of lemco to S M had an almost negligible effect on the action of penicillin, streptomycin, chloramphenicol, and boric acid This was not true, however, of the sodium salt of *p* aminosalicylic acid (P.A S) It is not proposed to consider in detail the effect of lemco on P A S , but it may be stated that, whereas lemco increases the rapidity of the bactericidal action of sulphathiazole on *Bact coli* without altering its bacteriofrenic titre, its main action on P A S is greatly to extend the bacteriofrenic titre of the substance without appreciably altering its bactericidal effect

ACTION OF SULPHATHIAZOLE IN S M AND IN L.S.M

In most of the experiments counts were made after about 24, 48, and 72 hours' incubation It seemed desirable to supplement the information so obtained by making counts at intervals of 2 or 4 hours It will suffice to give details of one such experiment, the results of which were in general agreement with those obtained in other experiments To avoid the use of large numbers of bottles and slopes, only two concentrations of sulpha thiazole (64 and 4 mg per 100 ml.) in S M and L.S M were used The figures in table VII, which were used for the construction of figs 1 and 2, were the means of the counts obtained in three similar bottles in each case

TABLE VII—EFFECT OF LEMCO ON ACTION OF SULPHATHIAZOLE AGAINST *Bact coli*

Hours	Concentration of sulphathiazole			
	64 mg per 100 ml		4 mg per 100 ml.	
	No of bacteria per loop in			
	S.M	L.S.M	S M	L.S M
0	22	22	22	22
2	15	47	43	45
4	28	150	180	150
6	35	190	260	270
8	55	220	350	180
10	70	140	400	120
12	53	89	320	60
16	55	12	220	18
20	58	1	300	6
24	22	0	170	5
28	15	0	230	2
32	22	—	250	3
36	22	—	300	1
48	22	—	240	0
60	15	—	200	0
100	0	—	14	—
192	0	—	5	—
288	—	—	1	—
312	—	—	0	—

First we may compare the counts obtained with a concentration of 64 mg of sulphathiazole per 100 ml in S M and in L S M (fig 1) In S M , after a small initial fall, the number of living bacteria increased slowly to a peak, at 10 hours, of just over three times the initial number Thereafter the number fell slowly and somewhat irregularly At 48 hours the number was identical with the initial number, at 60 hours slightly lower, and at 100 hours zero The corresponding counts obtained with L S M are completely different The number rose steeply to a peak of ten times the initial number at 8 hours, fell equally steeply to below the initial number at 16 hours, and then fell more slowly, reaching zero in 24 hours

The curve given by 4 mg sulphathiazole per 100 ml in S M differed markedly from that obtained with the higher concentration in the same medium Three peaks, each followed by a fall, occurred within the first 36 hours The primary peak was the highest (twenty two times the initial number), the secondary and tertiary peaks being identical at fourteen times the initial number Following the third peak there was a very slow fall to slightly below the initial number at 100 hours and to zero at 312 hours The curve given by the same concentration of sulpha thiazole in L S M presents a complete contrast The two curves are almost identical up to 6 hours, but in L S M the peak (twelve times the initial number) was reached at that time and the count then fell sharply to below the initial count at 16 hours and to zero at 24 hours

The following generalisations appear to be legitimate

(1) Sulphathiazole in a high concentration in S M is so bacteriofrenic as almost to justify the use of the term bacteriostatic Several days are required before sterility is reached

(2) Sulphathiazole in a low concentration (such as is attainable in the human body) in S M allows considerable multiplication of the bacteria before bacteriofrenic action appears A very much longer time is required for the production of sterility than is the case with high concentrations

(3) In the presence of lemco, high and low concentrations of sulphathiazole give almost identical results, which are completely different from those given by the same concentrations when lemco is absent After a short period of multiplication of the bacteria the count falls to zero so rapidly as to justify the application of the term bactericidal to the action of sulphathiazole

MODE OF ACTION OF LEMCO

In an attempt to throw light on the mode of action of lemco the rate of multiplication of *Bact coli* in S M and in L.S M without sulphonamide was investigated in several experiments Since the results obtained in these experiments were essentially similar, an account of one of them will suffice Two bottles containing S M and two containing L S M were inoculated with *Bact coli* and incubated Counts were made at 2 hour intervals up to 14 hours The figures given in table VIII are the means of the counts obtained in the pairs of bottles

Lemco (this is not necessarily true of L substance) stimulates the growth of *Bact coli* in S.M Up to 4 hours its action is scarcely detectable, at 6 hours obvious although slight, and at 8 hours definite Anything increasing the rate of multiplication of a bacterium might assist the antibacterial action of a substance such as sulphathiazole, and the possibility that L substance acts in this way must be considered Even if pure L substance behaves as did lemco in this experiment, it may be asserted with considerable confidence that it is not because of its growth stimulating action that L substance potentiates sulphathiazole The reason for this assertion is that this action of lemco is not clearly demonstrable until after 4 hours' incubation, whereas, as is seen in table VII and fig 1, the effect of lemco in the presence of sulphathiazole is obvious after 2 hours' incubation and striking after 4 hours

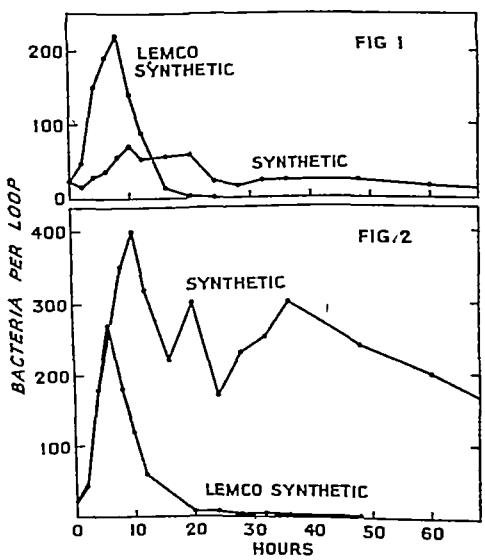

Fig 1—Comparison of effects of sulphathiazole 64 mg per 100 ml in S M and in L.S M

Fig 2.—Comparison of effects of sulphathiazole 4 mg per 100 ml in S M and in L.S M

TABLE VIII—EFFECT OF LEMCO ON RATE OF MULTIPLICATION OF *Bact coli*

Hours	No of bacteria per loop	
	S M	L.S.M
0	18	18
2	32	32
4	210	230
6	400	600
8	+/++	++
10	++	++
12	C (T)	T
14	T	TT

None of the experiments to elucidate the mode of action of the combination of L substance and sulphathiazole has thrown any light on the problem, and in the absence of experimental evidence mere speculation would be valueless It is not therefore proposed at present to propound any explanation of the L effect

EXPERIMENTS WITH URINE

Experiments were made in which human urine and human serum, in both of which *Bact coli* grows well, were used as culture media

The pH of one portion of a sample of urine was adjusted to 7 5, and the urine was boiled, the precipitated phosphates being removed by centrifuging Another portion of the same sample of urine was treated by contact with a synthetic resin which was known to adsorb L substance from fluids containing it The pH was adjusted and the phosphates were removed as in the case of the first portion Sulphathiazole was added to both untreated and treated urines so as to give a concentration of 64 mg per 100 ml, a concentration usually attained and often exceeded in the urine of a patient undergoing treatment The two samples of urine were inoculated with *Bact coli* (22 per loop) and examined after 24 hours' incubation The count in the untreated urine was 0, and in the treated urine 25 Urine, therefore, in the presence of sulphathiazole, displays the L effect and can be deprived of this property by contact with a material which adsorbs L substance Attempts to restore L activity to treated urine by the addition of lemco were only partially successful

EXPERIMENTS WITH SERUM

Fresh human serum to which had been added sulphathiazole to give a concentration of 8 mg per 100 ml, a concentration easily attainable in the blood of a patient, was inoculated, incubated, and tested An initial count of 22 was reduced to zero in 24 hours Serum, therefore, like urine, displays the L effect, but it was impossible to remove the L substance from it owing to alterations consequent on the great reduction in pH produced by contact with the synthetic resin

These experiments with urine and serum go further than the demonstration, already mentioned, that the addition of either urine or serum to synthetic medium containing sulphathiazole produces the L effect In these experiments the body fluids (one heated, the other unheated) themselves acted as culture media and, in conjunction with sulphathiazole, displayed the L effect It is impossible to state definitely that the substance in them responsible for the rapid killing of bacteria by sulphathiazole is identical with the L substance present in lemco, but it certainly behaves in the same way

IDENTITY OF L SUBSTANCE

The final experiments were undertaken in an attempt to determine whether the L substance was the same as the potentiator of sulphonamide activity present in

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Concentration of Brand's essence in S.M containing 16 mg of sulpha thiazole per 100 ml	No of bacteria per loop
1 100	0
1 200	0
1 400	0
1 800	0
1 1600	0
1 3200	0
1 6400	90
1 12,800	82
1 25 600	130
S M containing 16 mg of sulpha thiazole per 100 ml	
1	95
2	130
3	110
L.S M containing 16 mg of sulpha thiazole per 100 ml	
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Initial count 22
Incubation 47 hours

L effect was that it should give a zero colony count, while the counts given by the controls containing sulpha thiazole in S M were not less than the initial count The period of incubation was 30–48 hours If the period was too short (e g , 24 hours), the L S M controls did not always give zero counts , if too long (e g , over 48 hours) some of the S.M controls did occasionally give zero counts Table VI, which gives the results obtained in testing 'Brand's Essence' for L effect, illustrates the method The controls, which show high counts in S M and zero counts in L S M , being satisfactory, we may conclude that Brand's essence displayed the L effect in dilutions up to 1 3200

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The L effect was demonstrated by this method not only by lab lemco and Brand's essence but also by other commercial meat extracts ('Lemco,' 'Oxo,' and 'Erinox'), by infusions of beef, 'Difco' dehydrated beef and horseflesh, by commercial yeast extracts ('Marmite' and 'Gye'), by human serum and urine, and by hæmolysed red blood cells Of these, gye (Guinness's yeast extract) was the most potent, showing in some experiments the L effect in a dilution of 1 320,000 The range displayed by different samples of human serum was from 1 1000 to 1 2000, and of human urine from 1 2000 to 1 6000 Hæmolysed human red blood cells showed the L effect up to a dilution of 1 800, and horse red blood cells at 1 50, but not at 1 100 In the case of blood cells the titre is expressed in terms of packed cells All the substances mentioned had been exposed to a temperature of at least 100°C for not less than 15 minutes before being tested

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ACTION OF SULPHATHIAZOLE IN S M AND IN L S.M

In most of the experiments counts were made after about 24, 48, and 72 hours' incubation It seemed desirable to supplement the information so obtained by making counts at intervals of 2 or 4 hours It will suffice to give details of one such experiment, the results of which were in general agreement with those obtained in other experiments To avoid the use of large numbers of bottles and slopes, only two concentrations of sulpha thiazole (64 and 4 mg per 100 ml) in S M and L S M were used The figures in table VII, which were used for the construction of figs 1 and 2, were the means of the counts obtained in three similar bottles in each case

TABLE VII—EFFECT OF LEMCO ON ACTION OF SULPHATHIAZOLE AGAINST *Bact coli*

Hours	Concentration of sulphathiazole			
	64 mg per 100 ml		4 mg per 100 ml.	
	No of bacteria per loop in			
	S.M	L.S M	S M	L.S.M
0	22	22	22	22
2	15	47	43	45
4	28	150	180	150
6	35	190	260	270
8	55	220	350	180
10	70	140	400	120
12	53	89	320	60
16	55	12	220	18
20	58	1	300	6
24	23	0	170	5
28	15	0	230	2
32	22	—	250	3
36	22	—	300	1
48	22	—	240	0
60	15	—	200	0
100	0	—	14	—
192	0	—	5	—
288	—	—	1	—
312	—	—	0	—

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The curve given by 4 mg sulphathiazole per 100 ml in S M differed markedly from that obtained with the higher concentration in the same medium Three peaks, each followed by a fall, occurred within the first 36 hours The primary peak was the highest (twenty two times the initial number), the secondary and tertiary peaks being identical at fourteen times the initial number Following the third peak there was a very slow fall to slightly below the initial number at 100 hours and to zero at 312 hours The curve given by the same concentration of sulpha thiazole in L S M presents a complete contrast The two curves are almost identical up to 6 hours, but in L S M the peak (twelve times the initial number) was reached at that time and the count then fell sharply to below the initial count at 16 hours and to zero at 24 hours

equally rapid fall to zero within a period which was sometimes as short as 24 hours and rarely as long as 36 hours A constituent of lemco, which we have provisionally named the L substance, potentiates sulphathiazole so that it acts as a bactericidal rather than as a bacteriofremic substance

The presence of L substance in extracts of meat and in serum, red cells and urine suggests that it is generally present in the tissues and fluids of the body The demonstration that, in a synthetic medium free from sulphonamide antagonising substances and in serum and urine, the combination of sulphonamide and L substance behaves bactericidally strongly suggests that sulphonamides in vivo have more than the bacteriofremic or bacteriostatic effect generally attributed to them It is therefore claimed that, to explain the therapeutic effects of the sulphonamides, it is unnecessary to evoke the "ordinary defence mechanisms" of the body Sulphonamides, potentiated by a naturally occurring constituent of the body, can kill invading bacteria sensitive to their action, provided that these are not present in inaccessible situations, in excessive numbers, or in association with such powerfully antagonistic substances as pus

The possible identity of L substance and the potentiator of sulphonamide action which Walker et al. (1947) investigated and to which they attribute the Harper and Cawston effect has been considered For convenience we shall refer to this as the E (erythrocyte) substance The two substances differ in five respects

1 L substance potentiates sulphonamides so that in nutrient media free from antagonistic substances their action on bacteria sensitive to them is bactericidal rather than bacteriofremic or bacteriostatic. E substance neutralises the sulphonamide antagonising substances present in peptone This action is termed neutralisation merely for convenience without implying any theory about how the E substance acts

2 The L effect can be demonstrated immediately after the addition of material containing the L substance to the culture medium For demonstration of the Harper and Cawston effect material containing the E substance must have been incorporated in the medium for at least some hours before it is tested

3 L substance is present in meat extracts, serum, red blood-cells, urine, and yeast E substance has been described as occurring exclusively in red blood-cells, particularly those of the horse It is only right to point out, however, that it may have a wider distribution than has been realised The experiment recorded in table IV shows that it (or a substance with similar action) is present in lemco The actions of both L and E substances in a particular material may be masked, as in the case of L substance in lemco by the simultaneous presence of sulphonamide-antagoniser The presence of the substances can then be demonstrated only if they are present in greater concentration than the antagoniser and only by the use of the material in suitable dilution.

4 The red blood-cells of man and horse contain both L and E substances but the proportions in which they occur in the two types of cell differ

5 L substance is thermostable E substance (according to Walker et al.) thermolabile

For these reasons we have no hesitation in affirming our belief that the sulphonamide potentiator, which we term L substance, is different from the substance which counteracts the sulphonamide antagonising action of peptone, and which is believed to be the active agent in the production of the Harper and Cawston effect

The production of L substance by yeast suggests the possibility that it, and also E substance can be produced by some species of bacteria If this is found to happen there would be little difficulty in explaining the varied sensitivities of different bacterial species to sulphonamides in culture media containing sulphonamide antagonising substances

It must be emphasised that throughout this research a single strain of one bacterial species has been used It would be rash to assume that what is true of it is necessarily true of other species, but it must be regarded as highly improbable that the phenomenon which we have considered does not also occur with other species of bacteria

SUMMARY

1 The sensitivity of a bacterium to sulphonamides is grossly underrated when ordinary culture media are used.

2 Treatment of such media by the method of Harper and Cawston increases the apparent sensitivity of the bacterium to sulphonamides, but only to a limited extent

3 *Bacterium coli*, which grows well in a simple synthetic medium, is much more sensitive to sulphonamides in a synthetic medium than it is in media treated by the method of Harper and Cawston

4 An improved synthetic medium is described

5 The action of sulphathiazole on *Bact coli* in synthetic medium is bacteriofremic rather than bacteriostatic or bactericidal

6 The addition of a small amount (1 20,000) of lemco to synthetic medium potentiates sulphathiazole so that its action is bactericidal.

7 The substance responsible for the potentiating action of lemco is present in meat extracts, serum, red blood-cells urine, and yeast

8 The provisional name, L substance, has been given to this constituent of lemco

9 The L substance, which is basic, has been concentrated and partially purified but not yet identified

10 Since L substance is present in various body fluids which contain little, if any, sulphonamide antagonisers, it is suggested that, in the living body, the action of sulphonamides is bactericidal rather than bacteriofremic or bacteriostatic, and that, to explain their therapeutic effect, it is unnecessary to evoke the "ordinary defence mechanisms" of the body

11 The L substance is different from the substance in horse red blood-cells which is responsible for the Harper and Cawston effect

It gives us great pleasure to acknowledge our indebtedness to the Medical Research Council of Ireland grants from which have rendered it possible for one of us (G C W) and Mr Boggust to engage in the work described here We are most grateful to Professor Fearon and Mr Boggust, to our colleagues and the staff of the department of bacteriology, and to many others for the advice and assistance which they have so willingly given us

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In greater medicine all enquiry into the cause and natural history of disease its response to environment and the reactions of the body to treatment, operative or otherwise, is real research and if such enquiries are made on careful lines which involve exactitude and measurement, then such enquiry has every right to be spoken about as scientific research. The common idea is that such work cannot be research unless it is associated with laboratories, animal experiments ultra microscopic investigations extensive apparatus, many assistants and so on —Prof G GREY TURNER in his presidential address to the 13th Congress of the International Society of Surgery New Orleans, 1949 (*Trans int Soc. Surg* August, 1950)

TABLE IX

S M containing 16 mg of sulphathiazole per 100 ml. and				No of bacteria per loop
Peptone	Lemco	Hæmolysed horse red cells	Hæmolysed human red cells	
—	—	—	—	140
—	1 20 000	—	—	0
—	—	1 25	—	0
—	—	1 100	—	0
—	—	1 400	—	36
—	—	1 1600	—	240
—	—	—	1 25	0
—	—	—	1 100	0
—	—	—	1 400	0
—	—	—	1 1600	7
1 5000	—	—	—	+ +
1 5000	—	1 25	—	0
1 5000	—	1 100	—	0
1 5000	—	1 400	—	17
1 5000	—	1 1600	—	120
1 5000	—	—	1 25	21
1 5000	—	—	1 100	48
1 5000	—	—	1 400	140
1 5000	—	—	1 1600	+

Initial count 24
Incubation 36 hours

horse red blood cells, which Walker et al (1947) consider the main, if not the sole, factor responsible for the Harper and Cawston effect There is general agreement that this effect is better demonstrated by horse hæmolysate than by any other material, and that, for the most complete demonstration of the effect, the material must be left for some time in contact with the culture medium before the medium is heated or used According to Walker et al, the potentiator, as present in the hæmolysate, is thermolabile, but, after it has been in contact with the medium, the medium does not regain its sulphonamide antagonising properties on being boiled

Human and horse red blood cells were washed in saline solution and hæmolysed with distilled water The hæmolysates so obtained were added in various proportions (expressed in terms of packed cell volumes) to S M, with and without peptone, and at the same time the necessary controls were set up All these fluids were kept at room temperature for 18 hours They were next heated to 100°C, and kept at that temperature for 15 minutes The coagula were removed by centrifuging from the fluids to which hæmolysate had been added, and all the fluids were again heated at 100°C for 15 minutes When they were cold, the necessary amount of sulphathiazole solution in S M was added to give a concentration of 16 mg per 100 ml The fluids, in duplicate 5 ml amounts, were inoculated, incubated, and tested in the usual way The technique was designed to elicit the greatest Harper and Cawston effect, and to determine, under comparable conditions, the L effect of the contents of horse and human red blood cells The figures in table IX are the means of the colony counts given by the duplicate bottles

The upper half of the table shows the results of the tests of the two hæmolysates for L effect. Human hæmolysate obviously contained much more L substance than did that of the horse If more closely spaced dilutions had been tested, the end points would probably have been about 1 200 for horse and 1 1200 for human hæmolysates, the titres being expressed in terms of packed cell volume

The lower half of the table shows the results of tests of the hæmolysates for Harper and Cawston effect The presence of 1 5000 peptone antagonised the bacteriofrenic action of sulphathiazole (16 mg per 100 ml) in synthetic medium to such an extent as to give an uncountable number of colonies (many thousands) per loop after 36 hours' incubation, and, when incubation was prolonged for a further 24 hours, turbidity The presence of horse hæmolysate in dilutions up to 1 1600 completely neutralised the sulphonamide antagonising action of peptone, and this neutralisation was so complete that the L substance also present in horse hæmolysate, was able to exercise its effect in the same dilution as it did in synthetic medium to which no peptone had been added Human hæmolysate also showed some ability to neutralise the sulphonamide antagonising action of peptone, but only to a dilution of 1 400 Further, it seems that with human hæmolysate, even in high concentrations, the neutralisation was less complete than with horse hæmolysate Despite its high content of L substance, human hæmolysate did not produce zero counts even when it was present in a concentration as high as 1 25

This experiment shows that horse and human hæmolysate contain both L substance and the substance responsible for the Harper and Cawston effect, but that the proportion of the two substances is different in the two hæmolysates

Mr W A Boggust, working under the direction of Prof W Fearon, has attempted to isolate and identify the L substance Concentrates very rich in it have been prepared from autolysed baker's yeast after deproteination and ethanol fractionation followed by selective adsorption The L substance is basic but has not so far been identified with any of the following basic compounds known to be present in yeast simple alkyl amines, arginine, lysine, histidine, betaines, guanidines, purines, pyrimidines, aneurine (thiamine), or tryptamine Work on the chemical nature of the L substance is being actively pursued

DISCUSSION

Two quotations will suffice to show the currently accepted view on the action of sulphonamides on bacteria in the body

> "Sulfonamides are primarily, if not entirely, bacteriostatic in vitro, presumably relying on host defense mechanisms for final elimination of the bacteria in vivo" (Dubos 1948)

> "The concentrations of sulphonamides in the blood (5–15 mg per 100 ml) which are obtained by therapeutic doses do not kill organisms but inhibit their growth so that they are dealt with by the ordinary defence mechanisms" (Dunlop 1950)

The study of the action of sulphonamides on bacteria in vitro has been rendered difficult by the presence in culture media, as usually prepared, of sulphonamide antagonising substances We have avoided this difficulty by using (1) synthetic media relatively or completely free from these substances, and (2) a bacterium which grows well in such simple media

Most of those who have studied the antibacterial action of the sulphonamides have accepted, as their criteria of activity, the absence of turbidity in fluid media or of colony formation on solid media and for this reason have not been able to distinguish the killing of bacteria from inhibition of their growth The technique used by us enabled us to follow the action of sulphonamides on bacteria in the region where their numbers were too small to produce turbidity in fluid media, and it was owing to this that the phenomenon with which we are concerned was discovered

In the synthetic medium which we used the antibacterial action of very low concentrations of sulphathiazole on *Bact coli*, was demonstrated The action has been described as bacteriofrenic rather than bacteriostatic, since the sulphonamide though it restrains the multiplication of the bacteria does not entirely prevent it, as would a truly bacteriostatic substance Although, in the presence of sulphathiazole, the number of living bacteria, after a preliminary rise, ultimately falls to zero the rate of fall is so slow as to render the application of the term bactericidal quite inappropriate

During the course of the work we discovered that the addition of a very small amount of lemco to synthetic medium containing sulphathiazole completely altered the effect of the sulphonamide on the organism After a rapid increase, over a period of a few hours, in the number of living bacteria present, there was an almost

equally rapid fall to zero within a period which was sometimes as short as 24 hours and rarely as long as 36 hours A constituent of lemco, which we have provisionally named the L substance, potentiates sulphathiazole so that it acts as a bactericidal rather than as a bacteriofremic substance

The presence of L substance in extracts of meat and in serum, red cells, and urine suggests that it is generally present in the tissues and fluids of the body The demonstration that in a synthetic medium free from sulphonamide antagonising substances and in serum and urine, the combination of sulphonamide and L substance behaves bactericidally strongly suggests that sulphonamides in vivo have more than the bacteriofremic or bacteriostatic effect generally attributed to them It is therefore claimed that, to explain the therapeutic effects of the sulphonamides, it is unnecessary to evoke the "ordinary defence mechanisms" of the body Sulphonamides, potentiated by a naturally occurring constituent of the body, can kill invading bacteria sensitive to their action, provided that these are not present in inaccessible situations, in excessive numbers, or in association with such powerfully antagonistic substances as pus

The possible identity of L substance and the potentiator of sulphonamide action which Walker et al. (1947) investigated and to which they attribute the Harper and Cawston effect has been considered For convenience we shall refer to this as the E (erythrocyte) substance The two substances differ in five respects

1 L substance potentiates sulphonamides so that in nutrient media free from antagonistic substances their action on bacteria sensitive to them is bactericidal rather than bacteriofremic or bacteriostatic E substance neutralises the sulphonamide antagonising substances present in peptone This action is termed neutralisation merely for convenience without implying any theory about how the E substance acts

2 The L effect can be demonstrated immediately after the addition of material containing the L substance to the culture medium For demonstration of the Harper and Cawston effect material containing the E substance must have been incorporated in the medium for at least some hours before it is tested

3 L substance is present in meat extracts, serum, red blood-cells, urine, and yeast E substance has been described as occurring exclusively in red blood-cells, particularly those of the horse It is only right to point out however, that it may have a wider distribution than has been realised The experiment recorded in table IV shows that it (or a substance with similar action) is present in lemco The actions of both L and E substances in a particular material may be masked, as in the case of L substance in lemco by the simultaneous presence of sulphonamide antagoniser The presence of the substances can then be demonstrated only if they are present in greater concentration than the antagoniser and only by the use of the material in suitable dilution.

4. The red blood-cells of man and horse contain both L and E substances but the proportions in which they occur in the two types of cell differ

5 L substance is thermostable, E substance (according to Walker et al) thermolabile

For these reasons we have no hesitation in affirming our belief that the sulphonamide potentiator, which we term L substance, is different from the substance which counteracts the sulphonamide antagonising action of peptone, and which is believed to be the active agent in the production of the Harper and Cawston effect

The production of L substance by yeast suggests the possibility that it, and also E substance, can be produced by some species of bacteria If this is found to happen, there would be little difficulty in explaining the varied sensitivities of different bacterial species to sulphonamides in culture media containing sulphonamide antagonising substances

It must be emphasised that throughout this research a single strain of one bacterial species has been used It would be rash to assume that what is true of it is necessarily true of other species, but it must be regarded as highly improbable that the phenomenon which we have considered does not also occur with other species of bacteria

SUMMARY

1 The sensitivity of a bacterium to sulphonamides is grossly underrated when ordinary culture media are used

2 Treatment of such media by the method of Harper and Cawston increases the apparent sensitivity of the bacterium to sulphonamides, but only to a limited extent

3 *Bacterium coli*, which grows well in a simple synthetic medium, is much more sensitive to sulphonamides in a synthetic medium than it is in media treated by the method of Harper and Cawston

4 An improved synthetic medium is described

5 The action of sulphathiazole on *Bact coli* in synthetic medium is bacteriofremic rather than bacteriostatic or bactericidal

6 The addition of a small amount (1 20,000) of lemco to synthetic medium potentiates sulphathiazole so that its action is bactericidal.

7 The substance responsible for the potentiating action of lemco is present in meat extracts, serum, red blood-cells, urine and yeast

8 The provisional name, L substance, has been given to this constituent of lemco

9 The L substance, which is basic, has been concentrated and partially purified but not yet identified

10 Since L substance is present in various body fluids which contain little, if any, sulphonamide antagonisers, it is suggested that, in the living body, the action of sulphonamides is bactericidal rather than bacteriofremic or bacteriostatic, and that, to explain their therapeutic effect, it is unnecessary to evoke the "ordinary defence mechanisms" of the body

11 The L substance is different from the substance in horse red blood-cells which is responsible for the Harper and Cawston effect

It gives us great pleasure to acknowledge our indebtedness to the Medical Research Council of Ireland, grants from which have rendered it possible for one of us (G C W) and Mr Boggust to engage in the work described here We are most grateful to Professor Fearon and Mr Boggust, to our colleagues and the staff of the department of bacteriology, and to many others for the advice and assistance which they have so willingly given us

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"In greater medicine all enquiry into the cause and natural history of disease its response to environment and the reactions of the body to treatment, operative or otherwise is real research and if such enquiries are made on careful lines which involve exactitude and measurement, then such enquiry has every right to be spoken about as scientific research. The common idea is that such work cannot be research, unless it is associated with laboratories animal experiments ultra microscopic investigations extensive apparatus many assistants and so on. —Prof G GREY TURNER in his presidential address to the 13th Congress of the International Society of Surgery, New Orleans, 1949 (*Trans int Soc. Surg* August 1950)

THE FEEDING OF SCHOOL-CHILDREN

FERANGCON ROBERTS
M.A., M.D Camb, F.F.R
From Addenbrooke's Hospital, Cambridge

IN a secondary modern school in Cambridgeshire, two problems have arisen in connection with the feeding of the children The first is that despite every inducement not more than 27% of the children can be made to drink milk—a figure much lower than in neighbouring schools and lower than the average for the whole country The second concerns the quantity of food which should be provided in the school dinner Estimates made during the war on five successive days by an official of the Ministry of Education gave calorie equivalents ranging between 580 and 780, with an average of 649 from sample helpings and 705 from the total quantity of ingredients As the result of this report the quantity was increased and was found a year later to give a value of 845 from total ingredients Even this figure, however, failed to satisfy the official who pointed out that the Ministry's recommendation was 1000 calories

The unpopularity of milk, together with the fact that the dinner, to judge by the amount left uneaten, appeared to be more than sufficient though well below the Ministry's standard, naturally caused the governors and staff no little concern Should the children be yet further cajoled into drinking milk, and in view of the waste at 800 calories, should the dinner really be stepped up to 1000? In an attempt to find the answer to these questions I resolved to study radiologically the state of the children's stomachs at intervals throughout the day under varying conditions of intake

THE DAILY INTAKE

The children are drawn from a large central village (partly industrialised) and from the surrounding rural district, travelling to and from the latter by bus or bicycle With few exceptions the children are well cared for Wages are good and employment is full Many of the parents grow their own vegetables and keep hens Medical inspection has consistently revealed a high standard of health with no trace of any deficiency diseases Many of the children begin the day in luxury (compared with my own childhood) by having tea brought to them in bed by their mothers Breakfast usually consists either of cereals followed by bread and butter or of bread and butter with an egg or bacon On arriving home at 4 30 P M they have either a plain tea, followed at 9 by a substantial meal which includes cheese, meat, or something fried, or a high tea with perhaps pork-pie, bread and butter, and salad, followed at 9 by tea or cocoa with bread and butter or cake Further, about half the children take to school a packed lunch which they eat during the break

Assembly is at 9 15 A M Before this investigation was conducted, milk with or without the packed lunch was taken, as it was and still is, I believe, at other schools, during the morning break, between 10 35 and 10 45 The packed lunch has to be seen to be believed It consists of buns, cakes, chocolate, or cheese or potted-meat sandwiches in substantial amount, often having a calorie value of 250 Since ½ pint of milk contains 126 calories, if a child took this plus 240 calories in sandwiches and followed it up at 12 30 with the dinner of 1000 calories which the Ministry wants him to take, he would be stoking himself up with 1366 calories within two hours—an impossibility, as I shall show

I have on many occasions partaken of the dinner and have invariably found it well cooked, adequate, and appetising I have observed, however, that with a meal of about 800 calories a considerable amount, taken collectively, remains uneaten Green vegetables are less popular than one would expect in a district where they are grown in such abundance Many children, particularly the girls, take no meat They exhibit, too, the most curious likes and dislikes Baked pudding is unpopular, steamed pudding on the other hand is popular but is preferred unflavoured to flavoured

The reasons for the aversion to milk are several. During the war delivery was unreliable and it was not always possible to avoid mixing fresh milk with stale Some children dislike it cold but most of them dislike it whether warm or cold Many parents do not insist on their drinking milk at home The mania for slimming, caught no doubt from elder sisters, infects girls at quite an early age and is partly responsible Poverty was of course no reason, since milk could always be obtained free of charge in deserving cases Before milk became free for all, 90 bottles were taken by 220 children, after it was free the number dropped to 60 This diminution was, however, mainly due to the fact that when children paid for it a few took two, three, or even four bottles, while after it was free no child was allowed more than one There seems to be no reason why supplementary milk should not be allowed on payment

In my opinion, which is supported by many experienced people whose judgment I respect, the chief reason for the refusal of milk is that children, at any rate those in this locality, are given in one form or another more food than they really need One boy, who lived on a farm, scorned the school dinner because no partridges or pheasants were provided Estimates made from information provided by the children (admittedly an unreliable method but the only one available) gave an average daily intake, including milk and a fully eaten dinner, of at least 3000 calories Altogether, therefore, so far as quantity is concerned, the children are well fed

METHODS OF INVESTIGATION

A small quantity of barium sulphate given on a completely empty stomach is sufficient to fill the lumen except for that part at the fundus occupied by air Any contents already present, even as little as 25 ml, can be readily seen because the barium, by reason of its weight, passes through them without mixing with them, coming to rest at the lower pole If the quantity of residual food is large the barium occupies the lower pole and extends a little way along the greater curvature, while the upper limit of the contents forms a wide fluid level below the air at the fundus The upper and lower limits are thus clearly shown, and the greater and lesser curvatures (the latter not always distinctly) can be identified by the faint difference in density between the stomach and the adjacent viscera Distortion being minimised by adopting a 6 ft distance, the films show with sufficient accuracy the volume of the contents

This method was used to determine the state of the stomach at the onset of the experiments In order to study the effect of food given subsequently it was supplemented by a second Here the food given was mixed with a quantity of barium insufficient to affect the taste but sufficient to cast a shadow

In the accompanying diagrams barium is indicated in solid black, and other gastric contents by horizontal lines Absence of such lines therefore indicates that the stomach was empty before the barium was introduced Sometimes, as in no 3 (fig 1) the barium is held up along the lesser curvature or in the folds of the mucosa

Two methods were open either to study the effect of varying conditions of diet on the same children or to study each child according to his normal habits The latter seemed preferable and was adopted except in two cases where, owing to a misunderstanding, the children were put in the wrong category

The number of examinations made was 27 It may be objected that this number was too small to form the basis of the deductions drawn Certainly no two stomachs are exactly alike, and no one stomach has to submit to the same experience every day It will be appreciated, too, that these experiments take a great deal of time (as much as I could spare from my normal work) and need the coöperation of a number of people As will be seen, however, the results are remarkably consistent An apparently more valid objection is that the normal behaviour of the stomach was disturbed by fear This objection, however, is quite groundless On their visits to the hospital the children were allowed to play about in the screening room and shown each others' hearts beating, an experience which naturally aroused great interest and took their minds off themselves The absence of fear is shown by the fact that the children subsequently importuned their teachers to be allowed to come again

THE STOMACH AT MILK-TIME (10 35 A.M)

Twelve children were examined at about 10 35 in order to determine what had happened to their breakfasts The results are shown in the first column of diagrams in figs 1, 2, and 3 The stomachs showed all degrees from repletion to complete emptiness Two surprising results emerged. In the first place the amount of the residue was not determined by the amount of breakfast which had been eaten. Of the four with completely empty stomachs, no 8 had had an egg and fried potatoes, no 9 fried egg and bacon with bread and butter, no 10 bacon and chip potatoes with bread and butter, and no 4 sausages and tomatoes with bread and butter Of those with the largest residues, no 1 had had bread and marmalade, no 2 'Farmer's Glory,' no 3 'Shredded Wheat' and two 'Spam' sandwiches, and no 8 bacon and one piece of bread and butter The amount of the residue therefore appeared to reflect individual differences in the rate of digestion

Equally surprising was the relation between the state of the stomach and the desire for milk Of five habitual non milk takers, the stomach was completely empty in three, almost empty in one, and contained a fair residue in one Of the four who habitually took milk, the stomach was completely empty in one, while in the other three there was a considerable residue Of the three who habitually took packed lunch as well as milk, one had a moderate and the others a large residue The desire for mid-morning nourishment is therefore not determined by the emptiness of the stomach. Apart from parental encouragement it seems that some children feel the need to keep their stomachs full while others do not

THE STOMACH AT DINNER TIME (12 30 P M)

Immediately after the above examinations the children were divided into three groups Group A (nos 1–4, fig 1) were given 1/3 pint of milk Of those in this group all habitually took milk without lunch, except one who took it only in winter (the examination was made in summer) Group B (nos 5–7, fig 2) were given 1/3 pint of milk together with the lunch which they had brought (their usual habit) Group C (nos 8–12, fig 3) were given nothing Of these, the first three normally took nothing, no 11 took milk, and no 12 took milk and lunch The last two appeared in this group by accident

The results are shown in the second column of diagrams in figs 1–3 In those who had taken nothing the stomach was completely empty Of the seven who had taken milk with or without lunch there was a moderate residue in two and a large residue in five The state of the stomach was reflected in appetite All with empty stomachs and the two with moderate residues felt hungry, while of the five with large residues only one felt hungry

THE EFFECT OF LUNCH WITHOUT MILK

Four other boys took at 10 35 A.M the lunch they had brought with them This consisted of potted meat sandwiches weighing roughly 80 to 90 g At dinner time some of this was still present in the stomach but, except in one boy, the amount was very much less than the amount after milk without lunch

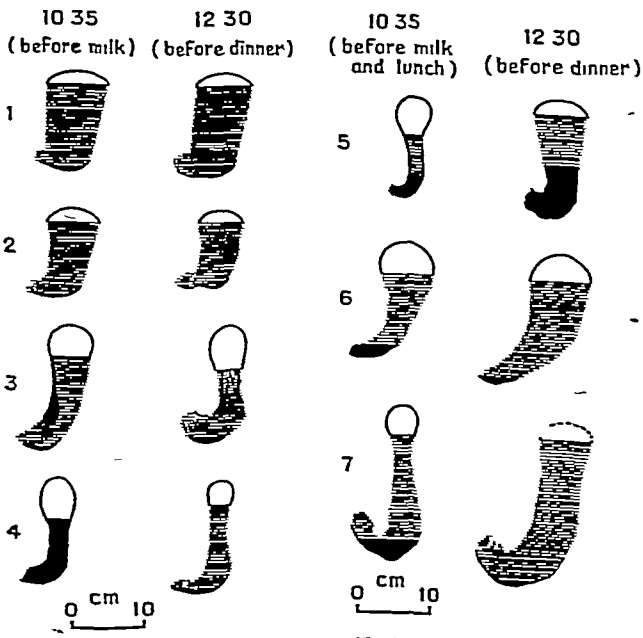

Fig 1—Milk taken at 10 40 A.M

Fig 2—Milk and lunch taken at 10 40 A.M.

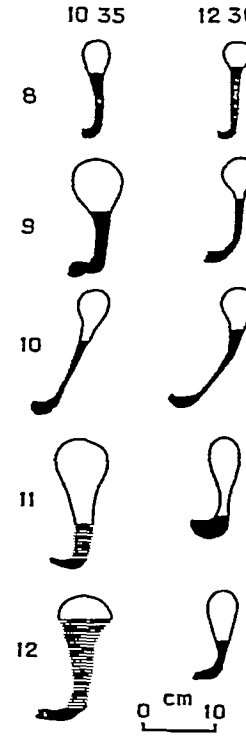

Fig 3—No milk or lunch taken

GASTRIC CAPACITY AND DIGESTION-RATE

The next problem was to discover the quantity of food which could be eaten at dinner and the time taken to digest it The experiment was carried out on three boys, of whom one (no 13) habitually took no milk or lunch, one (no 14) took milk only, and one (no 15) took both milk and lunch. After they had been examined at 10 35 A.M, no 14 was given milk, no 15 milk and lunch, and no 13 nothing Examination at 12 30 P.M (fig 4) confirmed the results described above In no 13 the stomach was empty, in no 14 there was a moderate residue, and in no. 15 a large residue.

At 12 30 P.M the boys were given dinner at the hospital. A meal of 800 calories was aimed at, actually it worked out at 788 It consisted of stewed steak with peas and potatoes followed by baked gingerbread pudding with custard sauce Into the potatoes and sauce a small

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The results are shown in the second column of diagrams in figs 1–3 In those who had taken nothing the stomach was completely empty Of the seven who had taken milk with or without lunch there was a moderate residue in two and a large residue in five The state of the stomach was reflected in appetite All with empty stomachs and the two with moderate residues felt hungry, while of the five with large residues only one felt hungry

THE EFFECT OF LUNCH WITHOUT MILK

Four other boys took at 10 35 A M the lunch they had brought with them This consisted of potted meat sandwiches weighing roughly 80 to 90 g At dinner time some of this was still present in the stomach, but, except in one boy, the amount was very much less than the amount after milk without lunch

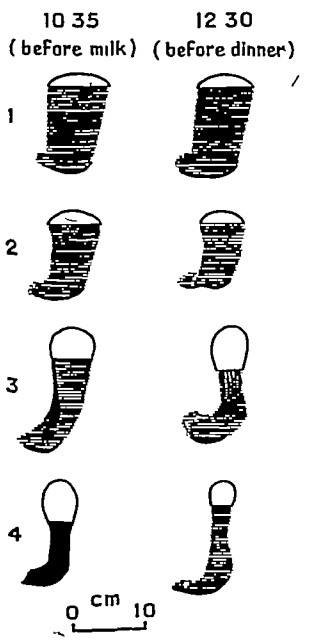


Fig 1—Milk taken at 10 40 A.M

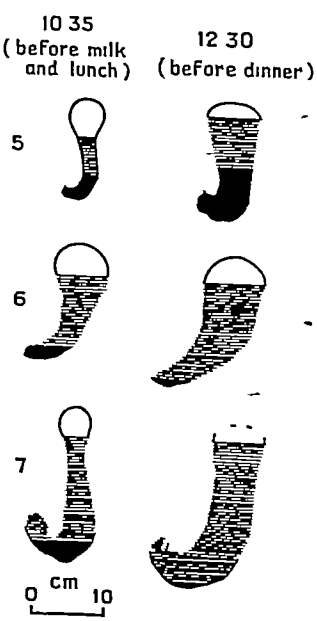


Fig 2—Milk and lunch taken at 10 40 A.M

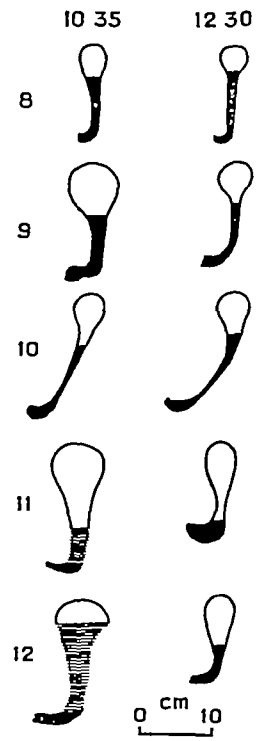


Fig 3—No milk or lunch taken

GASTRIC CAPACITY AND DIGESTION RATE

The next problem was to discover the quantity of food which could be eaten at dinner and the time taken to digest it The experiment was carried out on three boys, of whom one (no 13) habitually took no milk or lunch, one (no 14) took milk only, and one (no 15) took both milk and lunch After they had been examined at 10 35 A M, no 14 was given milk, no 15 milk and lunch, and no 13 nothing Examination at 12 30 P M (fig 4) confirmed the results described above In no 13 the stomach was empty, in no 14 there was a moderate residue, and in no 15 a large residue

At 12 30 P M the boys were given dinner at the hospital A meal of 800 calories was aimed at, actually it worked out at 788 It consisted of stewed steak with peas and potatoes followed by baked gingerbread pudding with custard sauce Into the potatoes and sauce a small

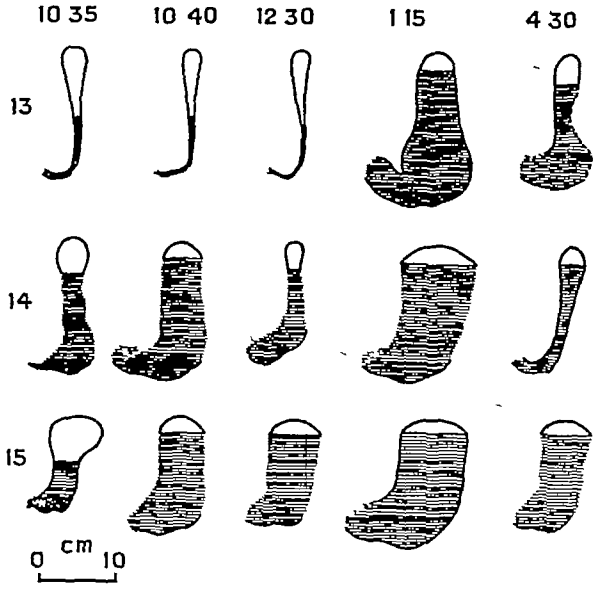
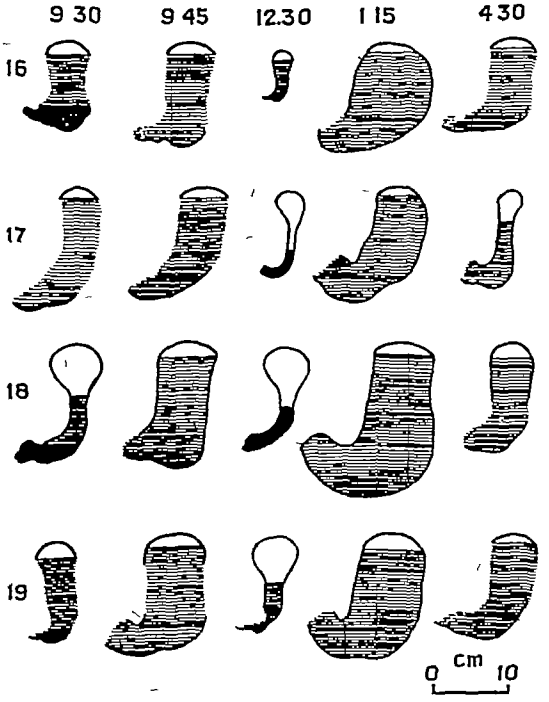


Fig. 4—For explanation see text

quantity of barium was incorporated The boys detected no difference in the taste but they did wonder why the potatoes looked so white They attacked the meal with zest but none of them succeeded in finishing it They had had enough at about 700 calories

They were examined immediately after dinner, and again at 4 30 P M, with the results shown in the fourth and fifth column of drawings in fig 4 The meal had caused the stomach to be distended to a maximum (fig 7) At 4 30 P M a large residue was still present in two boys, a moderate one in the third To this residue gastric juice largely contributed, as was obvious from the diminution in the opacity of the gastric contents



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To satisfy the principle, which will be discussed later, that the stomach should be empty by dinner time, three courses of action suggested themselves The dinner could be deferred to 1 0 P M, milk could be given with dinner, or milk could be given earlier in the morning The first of these proved impracticable owing to a Ministry regulation that two hours' instruction must be completed by 4 P M This would not allow sufficient time to clear up before lessons began The second course seemed hardly worth exploring If so many children could not take the meal provided without milk, still less could they take it with milk Moreover those parents who encouraged their children to take milk would react by increasing the quantity of the packed lunch There remained therefore the third course, to give the milk earlier

Four boys were given milk at 9 40 A M It will be seen (fig 5) that in all of them the stomach was completely or nearly empty at dinner time (Compare the third column of diagrams in figs 4 and 5) The required condition of an empty stomach at dinner time is therefore obtained by this simple procedure, which, as the result of these experiments, has been permanently adopted at this school, the milk being given directly after assembly and prayers The new system has, however, not made milk more popular Such an effect was indeed not to be expected, but the teachers have formed the impression that appetites at dinner have thereby been improved

At 12 30 P M these boys were given a meal of 800 calories All failed to finish it except one, a big boy The results (fig 5, columns 4 and 5) show that here again a considerable residue was still present at 4 30

THE QUANTITY AND DIGESTION-RATE OF THE SCHOOL DINNER

It remained to compare the effect of the school dinner with the effect of the measured dinner Three boys were examined directly after a school dinner and again at 4 30 P M (fig 6) For two reasons conclusions from this experiment can be drawn only with reserve First, the number of examinations was too small Secondly, the experiment had perforce to be carried out on boys other than those who took the measured dinner It will be seen, however, that the degree of gastric distension is much less than after the measured dinner So far as it goes the evidence confirms the impression I have formed from many visits that the school dinner actually consumed is substantially less than the dinner of 800 calories which was provided at the hospital. Yet it is amply satisfying

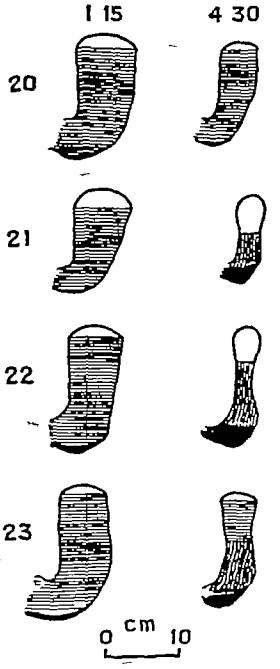

Fig 6—Stomachs after a school dinner

THE EMPTYING RATE OF THE STOMACH

It will be noted that even with a meal of less than 800 calories there is still a substantial residue four hours after it is taken This means that prevalent ideas must be discarded As the result of routine radiological examinations it has come to be

Fig 7—Stomach directly after a meal of about 700 calories note great distension

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By the method here adopted it is possible to arrive at a rough estimate of the maximum capacity of the stomach. On the assumption that the width of the stomach in the sagittal plane is equal to the width in the coronal plane, simple calculation shows that, in no 18 for instance, the contents attain a volume of over one litre (about two pints) To the dinner itself is added the water drunk, the residue from lunch, and also the gastric juice which at first may well contribute more than is lost through the pylorus Four hours later the contents measure at least a third of the maximum amount

THE EFFECT OF MILK ON BODY WEIGHT

An attempt was made over a period of three years to assess the effect of milk, with or without lunch, on body-weight The result however was inconclusive Many children took milk seasonally, and some changed their habits during the period. Moreover, despite the large number of children involved, individual differences in the rate of increase in weight within each category were very great

DISCUSSION

Children, boys especially, always have eaten and always will eat anything at any time of the day The late M. R James, provost of King's College, Cambridge, wrote of his school days "I and another have frequently sent out after twelve for 24 new ½d. buns or 24 new rice cakes, which were entirely forgotten by Hall time at two" Forgotten they may have been but that they had successfully negotiated the pylorus is highly improbable.

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The change in national habits from the few large meals of the past (meals with which the modern generation is unable to cope) to the frequent small meals of the present means that an alteration in function has been imposed upon the stomach From being an almost purely digestive organ it has become, in part at least, a reservoir rarely empty during the daytime We have no evidence that this change has any ill effects, but it is at least certain that if the stomach is permanently full or half full the digestive juice is correspondingly diluted. "Don't spoil your dinner," our mothers and grandmothers were never tired of saying It may well be that their admonitions against preprandial nibbling had a solid physiological basis Be that as it may, we have no explanation of the widespread incidence of peptic ulceration or of its increase in young adults

I do not claim that the results described here are applicable to children all over the country As I have said, these children are fortunate in their home conditions and in their opportunities for obtaining food on the side They are much more favourably situated than those living in large industrial towns Equally, official standards laid down centrally, though essential for some groups of children, may be quite unsuitable for others To impose and stress such standards without regard to local conditions causes unnecessary worry and heart-searching to governors and staffs who are conscientiously trying to do their best for the children under their care

It does more While it is essential that children should have enough to eat, it is equally important that food should not be wasted and that children should not view and participate in such wastage with indifference Wasting food is one of our less pleasant national characteristics, and one which horrifies other nations, especially the French. Nothing is worse than to put in front of a child a quantity of food determined by authority and to give him the idea that he can leave as much as he likes uneaten At this school vegetables have hitherto been served on to the plates with the meat I have recommended that the children should help themselves to vegetables They should thus learn not to take more than they think they can eat. Second helpings will of course be available

In this matter many parents have a great deal to learn There is no doubt that indulgence in fads and whims, so painfully obvious to the observer of a school dinner, is largely due to faulty home discipline, to indifferent cooking, and to peripatetic munching instead of sit-down meals Not the least valuable element in the school meal is that it teaches children that dinner is to be partaken of in an orderly manner and that its nutritional value is enhanced by its being a social function Slowly, but I believe surely, this lesson is being reinforced by the increasing facilities for teaching the art of cookery in schools and in evening classes We may confidently expect that the discipline thus instilled will in course of time exert a profound influence on what is after all one of the main functions of the home

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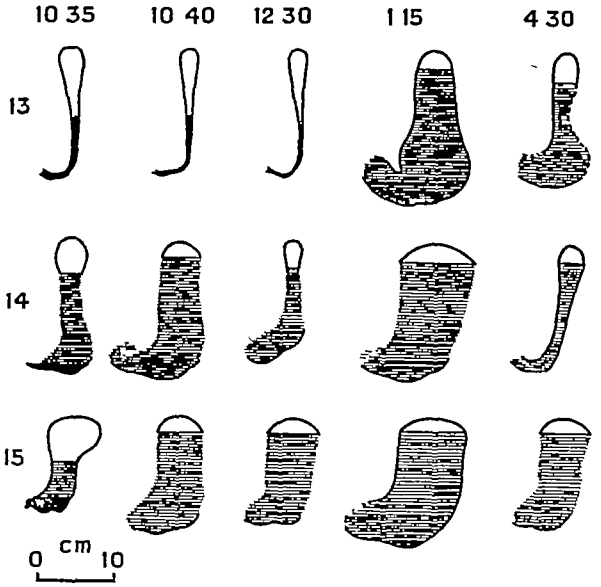
1 At dinner-time all children who had taken milk with or without lunch two hours previously had a considerable quantity of food in the stomach. With one exception all said they were not hungry On the other hand all children who took no milk had empty stomachs, and all said they were hungry

2. As a general rule the children who habitually took no milk had empty stomachs at milk time, while those who habitually took milk had not completely digested their breakfasts. The desire for milk is therefore



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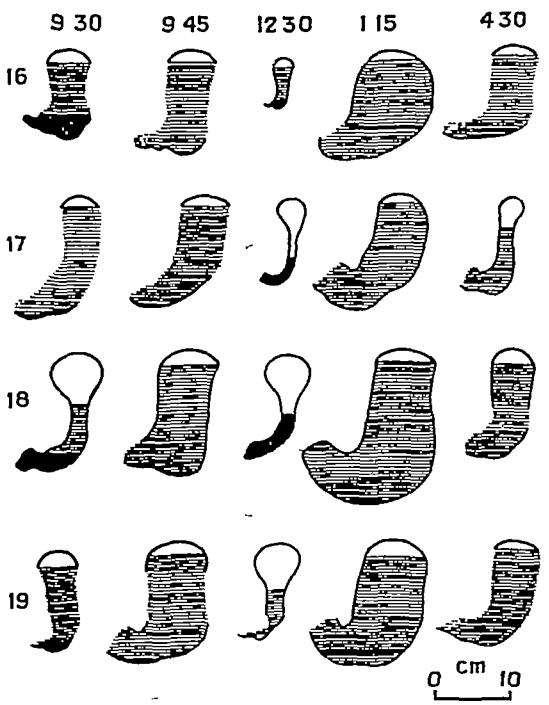

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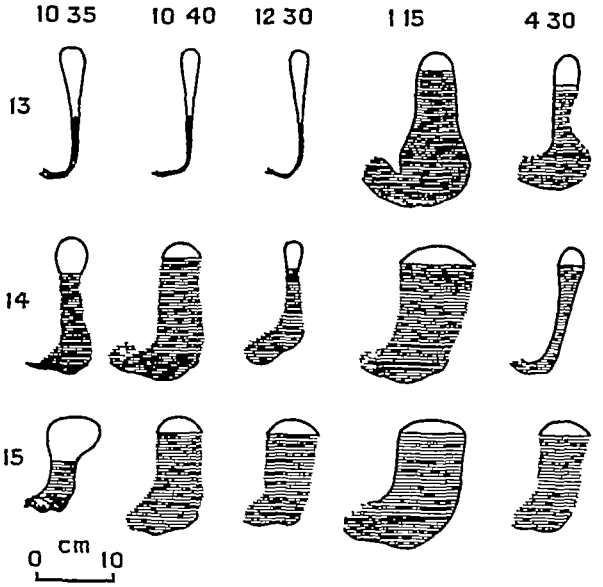

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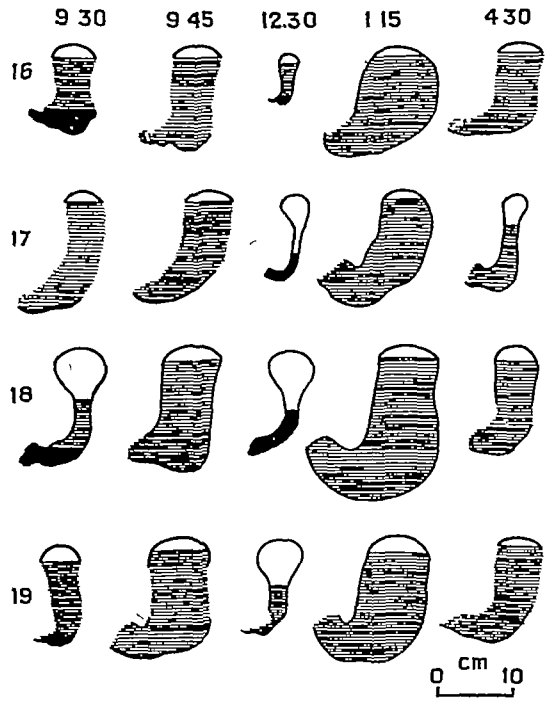

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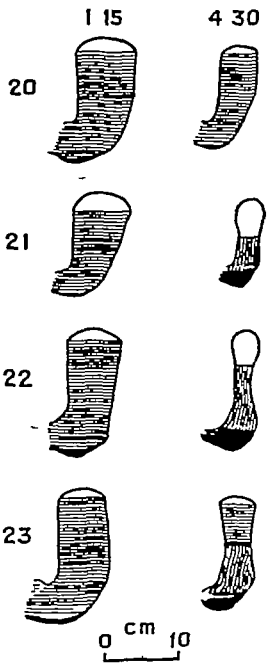

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In this matter many parents have a great deal to learn There is no doubt that indulgence in fads and whims, so painfully obvious to the observer of a school dinner, is largely due to faulty home discipline, to indifferent cooking, and to peripatetic munching instead of sit-down meals Not the least valuable element in the school meal is that it teaches children that dinner is to be partaken of in an orderly manner and that its nutritional value is enhanced by its being a social function. Slowly, but I believe surely, this lesson is being reinforced by the increasing facilities for teaching the art of cookery in schools and in evening classes We may confidently expect that the discipline thus instilled will in course of time exert a profound influence on what is after all one of the main functions of the home

CONCLUSIONS

1 At dinner time all children who had taken milk with or without lunch two hours previously had a considerable quantity of food in the stomach. With one exception all said they were not hungry On the other hand all children who took no milk had empty stomachs, and all said they were hungry

2 As a general rule the children who habitually took no milk had empty stomachs at milk time, while those who habitually took milk had not completely digested their breakfasts. The desire for milk is therefore

dictated not by the emptiness of the stomach but by the habit of keeping the stomach filled

3 Lunch without milk was digested more rapidly than milk without lunch

4 Whether milk had been taken or not the children failed to consume a dinner of 788 calories The standard of 1000 calories laid down by the Ministry of Education is therefore excessive for these children

5 Advancing the milk to 9 45 A M —that is, three hours before dinner—secured the attainment, desirable on physiological grounds, of an empty stomach by dinner-time

6 Whether milk had been taken or not, the stomach contained a quantity (sometimes large) of food four hours after dinner

7 When milk is offered and a good dinner is provided, packed lunch appears to be unnecessary

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As is well known, the action of sulphonamides on malaria parasites (as on other susceptible organisms) is inhibited by *p* aminobenzoic acid, recent work has shown that it is also inhibited by pteroylglutamic acid (Greenberg 1949) The action of proguanil on *P gallinaceum*, however, is not inhibited by *p* aminobenzoic acid (Bishop and McConnachie 1948), though it is by pteroylglutamic acid This lack of inhibition by *p* aminobenzoic acid was interpreted as meaning that proguanil possibly interferes with the utilisation of pteroylglutamic acid rather than its synthesis from *p* aminobenzoic acid

EXPERIMENTAL FINDINGS

The present experiments with *P berghei* were based on the chemotherapeutic screening tests described by Thurston (1950) Infected mice were dosed by mouth for four days with the minimum effective dose of proguanil or sulphadiazine *p* Aminobenzoic acid or pteroylglutamic acid was given by mouth immediately after the dose of the drug Thin blood films, stained with Giemsa, were examined on the day after treatment ended, and the percentage of erythrocytes which were parasitised was recorded

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Drug and dose (mg /20 g)	Antagonist and dose (mg /20 g)		Mean % age of erythrocytes parasitized on 5th day	
			1st expt.	2nd expt.
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Proguanil acetate, 0 4	Control	—	0 05	0·02
	p Aminobenzoic acid—	0 01	0 0	0·01
		0 1	2 6	6 1
		1 0	7 8	7 7
		10 0	6 3	13 3
Sodium sulphadiazine, 0 01	Control	—	0 1	0 8
	p Aminobenzoic acid—	0 1	5 0	31 5
		1 0	7 0	11 9
		10 0	—	26 1
Untreated control	—		17 6	9 7
Proguanil acetate, 0 4	Control	—	1 0	0 1
	Pteroylglutamic acid—	0 01	—	0·0
		0 1	—	0·4
		1 0	0·0	0 2
		10 0	0 7	0 1
Sodium sulphadiazine, 0 01	Control	—	0 1	0·0
	Pteroylglutamic acid—	0 01	—	0 0
		0 1	—	0 0
		1 0	2·0	2·0
		10 0	6 0	—

The results of the experiments (see table) show that the action of proguanil was inhibited by *p* aminobenzoic acid, the minimum effective dose being 0 1–0 01 mg per 20 g mouse Its action was not inhibited by pteroyl glutamic acid These results are in opposition to the findings with *P gallinaceum* and show that with *P berghei* the action of proguanil more closely resembles that of the sulphonamides than had previously been supposed, though fundamental differences still remain Probably proguanil affects some reaction in which *p* aminobenzoic acid is involved but which does not lead to the synthesis of pteroylglutamic acid

The action of sulphadiazine was inhibited by both *p* aminobenzoic acid and pteroylglutamic acid This is in accord with previous reports of inhibition of its action on bacteria and in other species of malaria

SUMMARY

The action of proguanil against *P berghei* was found to be inhibited by *p* aminobenzoic acid but not by pteroylglutamic acid Against *P gallinaceum* its action had previously been shown to be inhibited by pteroyl glutamic acid but not by *p* aminobenzoic acid The action of sulphonamides on malaria parasites is known to be inhibited by both substances

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'English, I understand is cultural, particularly Shakespeare mathematics are not, especially Newton. A language other than your own (whether or no you are articulate in the latter) is cultural, especially if it is dead Science is not —under any circumstances What nonsense it all is! at bottom it reflects an unwillingness to leave the old and well tried formulæ for the exciting and difficult business of distilling a new culture out of a new and exciting world — Sir JOHN MEDLEY, *Aust N.Z J Surg* 1950 **20**, 1

ILEOJEJUNAL INSUFFICIENCY ARISING FROM FAULTY ANASTOMOSIS

C F J CROPPER
O.B.E, F.R C P.E
SENIOR PHYSICIAN

P W HOUGHTON
M.B Lond, F.R C S
SENIOR SURGEON

MINISTRY OF PENSIONS HOSPITAL, RONKSWOOD, WORCESTER

THE factitious induction in man of a naturally occurring disorder compels the attention of every observer of disease For this reason, and as a warning and a reminder, we recount the clinical story of a man who came under our care in the final stage of a calamity which had overtaken him in 1945 and had been diagnosed as sprue

CASE-RECORD

Mr W, single and intelligent, had spent the greater part of his 48 years at sea with the Merchant Navy, in all climates

History of Present Illness

Until 1941 his medical record was immaculate but in that year he developed a duodenal ulcer and by 1944 he could no longer follow the sea In the autumn of 1945 he had a severe hæmatemesis and it is recorded that at operation in December a large active duodenal ulcer was found and a posterior gastro-enterostomy was constructed. The patient said that seven days after his operation he was seized of abdominal pain, distension, and vomiting, and that this was overcome by gastric suction and saline infusion during a week of acute distress But convalescence was slow he was troubled by flatulence hungry yet losing weight, he had little energy and when, eight weeks after his operation, he developed swelling of his legs and feet and a frequent offensive diarrhœa, a melancholy clouded his native optimism.

As the year 1946 went by his state worsened and became more complex. Towards July both thighs and the lower abdominal wall became sodden with œdema the dropsy was gravitational and the emptied limbs would fill in a few minutes with a conscious flush of fluid Suppression by bandaging was unbearable His appetite was ravenous but eating became a penance because of a sore tongue and mouth which now came to stay By day his abdomen became blown up from some 37 in. of circumference to about 43 in., and, though he never vomited or suffered much pain, the belly was skin tight At night, when lying on his back his belly was still when he turned to the left high pitched peristalsis broke the night silence, but when he turned to the right he began serial bowel actions which lasted into the early hours With shattering blasts of offensive wind, he would pass ten or twelve semifluid, pale, malodorous stools and his distension would subside

In July 1946, he was admitted to the medical wards of a general hospital and retained for six months His physicians presumed tropical sprue, or a pancreatic injury received at operation, to be the cause of his illness When iron, liver and vitamin therapy failed, he revived to some extent on a high protein low fat diet so that by October he had little œdema and less distension. He went home failed to get the hospital diet, and relapsed immediately A second course of inpatient treatment helped him but from his discharge in February, 1947, until his admission to the Ministry of Pensions Hospital, Ronkswood, in April, 1949 he remained at home in increasing distress

Condition on Admission

We beheld a man haggard languid, bedridden, emaciated yet hydroptic in all his loose tissues below the neck. The soddened panniculus of the thighs could be moulded like a lump of clay retaining the imprint for an hour or more The belly was tense with ascitic fluid and bowel wind The skin, glossy where under watery distension, was branny and atrophic elsewhere though nowhere ulcerated or fissured and the mucocutaneous junctions were healthy His eyes were clear of conjunctival and corneal changes and the digital extremities were undeformed He complained bitterly of his sore tongue and mouth which were raw beef red and fissured yet smooth between the indentations and nowhere ulcerated

His temperature was 98 4°F his pulse rate 72 his respiration rate 20 and his blood pressure 100/50 mm. Hg Shortness of breath apart he lacked pulmonary or cardiac signs and oddly enough the thoracic serous cavities were free of fluid No abnormality was detected in the nervous system or special senses.

At this time the time-table of his bowel actions was less systematic and he expelled about three or four pale bulky soft offensive stools in 24 hours Periods of constipation occurred when his abdomen became even more distended, and he would then belch offensive flatus

The Diagnosis

The assumption of sprue did not commend itself there was no supporting history antecedent to the operation, he had never been particularly anæmic and specific therapy had failed The presumed pancreatic injury at operation would have destroyed him forthwith or led to the slow formation of a fistula or cyst tuberculosis might cause ascites but hardly a general anasarca, and the operation had excluded both Crohn's disease and ulcerative colitis We discussed the possibility of low loop anastomosis but could not credit it The alternative possibility of a gastrocolic fistula was supported by his eructations with the smell of bowel wind—though gastric stagnation can generate offensive enough flatus But to suppose that such a fistula could be due to anastomotic peptic ulceration seemed specious for the onset had rapidly succeeded the operation and in our experience no gastrocolic fistula has led to general œdema

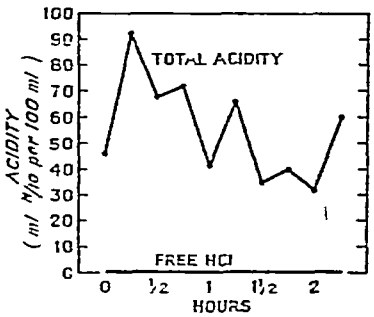

Fig 1—Results of test-meal (Starch present throughout bile mucus and blood absent.)

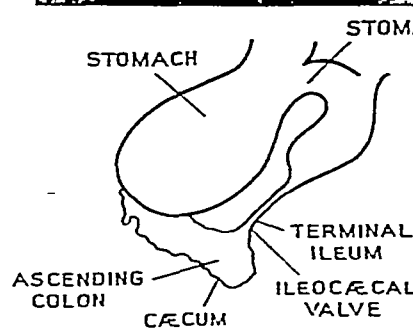

Fig 2—Appearances one hour after barium meal

dictated not by the emptiness of the stomach but by the habit of keeping the stomach filled

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4 Whether milk had been taken or not the children failed to consume a dinner of 788 calories The standard of 1000 calories laid down by the Ministry of Education is therefore excessive for these children

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		0 1	—	0 4
		1 0	0 0	0·2
		10 0	0 7	0 1
Sodium sulphadiazine 0 01	Control	—	0 1	0·0
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		0 1	—	0 0
		1 0	2 0	2 0
		10 0	6 0	—

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TABLE I—WEIGHT VARIATIONS, APRIL–SEPTEMBER, 1949

Date	Lb	Date	Lb
April 24	134	July 10	124
May 1	137	July 17	130
May 8	136	July 24	142
May 14	143	Aug 7	152
June 26	118	Aug 21	166
July 3	119	Sept 10	168

economy Not only the stomach but also the œsophagus and the saliva had become chronically and profusely infected with *Bact coli*, and though the saliva was free of alien organisms by Sept 12 the stomach was still heavily infected four months after operation, neither had free hydrochloric acid returned, though the total acid was much lower By January, 1950, the stomach was aseptic and free HCl was present in the secretion On the other hand the glucose tolerance test became normal between Aug 10 and Sept 12 Not only glucose but lævulose absorption had been depressed (fig 5), a tolerance test on July 17 had shown depressed absorption of fructose, in comparison with the normal curve in tropical sprue (Maegraith et al 1945)

The reasons for the abnormal carbohydrate absorption are not clear It persisted long after the surgical destruction of the fistula and after the patient had recovered a good measure of health, but it cleared in spite of a lusty upper alimentary infection with concomitant radiological evidence of jejunitis Moreover, in a case of tropical sprue with characteristically disordered protein and carbohydrate absorption, we found that cultures of gastric fluid were negative

The comparatively long persistence of achlorhydria for all functional purposes is in contrast with the appearance of hyperchlorhydria within twelve days in our cases of true gastrocolic fistulæ where surgical separation without gastrectomy has been undertaken Perhaps the presence of a large stoma for over four years causes profound, and possibly lasting, changes in the gastric mucosa However, neither these changes nor the infection hindered

TABLE II—SERUM-PROTEINS (G PER 100 ML.) APRIL–SEPTEMBER, 1949

Date	Total	Albumin	Globulin
April 25	4 3	2 23	2-07
May 2	3 92	2 23	1-69
May 7	4 11	1 92	2 19
May 24	3 92	1 76	2 16
June 8	5 28	2 54	2 72
June 15	5 46	3 2	2 26
June 22	6 31	3-05	3 26
June 30	6 97	3 58	3 39
July 6	6 53	3-58	2 95
July 24	6-6	3-6	3-0
Aug 10	6 7	3-6	3 1

protein absorption from the time of the final operation Perhaps the loss of the pancreatic ferment had been the deciding factor in preventing protein assimilation Without question the œdema was nutritional according to Davis and Getzoff's (1942) classification the condition was a prehepatic hypoproteinæmia Fig 4 illustrates the loss of weight as œdema disappeared and serum protein rose Perhaps mechanical pressure by the anastomosis on the inferior vena cava added to the hydropsis of the lower limbs

Our conclusions on fat assimilation cannot be dogmatic, for the amount of fat in the stools was limited by the patient's inability to tolerate fat in his food Even on his fat free diet however the quantity of fat in the stools was appreciable and the raised split/unsplit fat ratio may signify disordered fat digestion. Hinds Howell (1945) has pointed out that in early cases of sprue the total percentage is often within normal limits whereas the split/unsplit fat ratio may be raised above 3/1 Restoration of the normal channel, giving the food access to the pancreatic lipase and the bile, was sufficient to correct fat absorption.

Our patient showed no deficiency in the serum-calcium and serum-phosphorus nor did he suffer from tetany Maegraith et al. (1945) have pointed out that, though calcium absorption may be unaffected in cases of sprue syndrome in tetany, the blood-magnesium may lie between 0 75 and 1 2 mg per 100 ml. Our patient's long bones were not rarefied. In fact, the mineral metabolism observed seemed scarcely interfered with Even the blood picture was normal

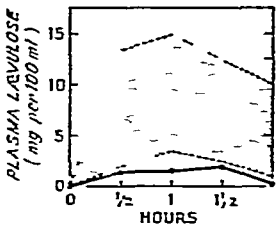

Fig 5—Lævulose-tolerance curve (July 15 1949)

Clinical signs of vitamin deficiency were confined to the tongue and mouth He had a "magenta" and a psilotic tongue, and if these are signs of hyporiboflavinosis they were the only ones Corneal and circumcorneal capillary injection were absent, but Stannus (1944) does not esteem these true signs of this particular deficiency

Similar disorders of nutrition from mechanical causes in the alimentary tract were collected by Benker and Hammet (1939) Izod Bennett and Hardwick (1940) cast their net more widely and included cœliac disease, idiopathic steatorrhœa, tropical sprue and mechanical abnormalities of the intestinal tract under the generic title of "ileojejunal insufficiency" (To this list may be added blockage of the mesenteric lacteals—e g, by lymphadenoma or metastatic carcinoma—which affects assimilation of fat but not of other food constituents) Too little heed has been given to Bennett and Hardwick's paper, which collects a medley of disorders which have the same site in the wall of the small bowel, and give rise to much the same symptoms and signs With all this resemblance, however, they may differ widely in their morbid physiology one patient may have a normal sugar metabolism and a disordered protein assimilation with deficiency of several vitamins, while another case, clinically similar may show a quite different combination of changes Thus Cosh (1944) and Holman (1944) describe cases of recovery from massive resection of the small bowel with quite diverse and unpredictable physiological changes.

The disastrous complications we report will be avoided if in selecting a loop of intestine for anastomosis in gastro-enterostomy (with or without gastrectomy) the surgeon makes quite sure, by inspection, that it is the highest loop of jejunum To select a segment of bowel simply because one end of it is taut will lead, sooner or later, to selection of the terminal ileum, since both ends of the small intestine are fixed and they are less than six inches apart

Finally it must be said that if this surgical misadventure engendered much distress, it also relieved the patient of his duodenal ulcer

SUMMARY

In a man of 48 a grave illness suggestive of sprue dated from a gastro-enterostomy performed more than three years previously for duodenal ulcer Laparotomies revealed that the stomach, instead of being anastomosed to the highest loop of jejunum had been joined to the ileum only 4 in above the ileocæcal valve. Virtually the whole of the small intestine had thus been excluded from the functional alimentary tract

After a restorative operation, recovery was fairly rapid. Abnormalities in carbohydrate absorption disappeared before the gastric infection was overcome

Many other causes can produce similar manifestations of ileojejunal insufficiency In this variegated clinical

Investigations

The gastric fluid yielded a profuse growth of *Bacterium coli* It was bright yellow, turbid, and very offensive, and the high total acidity, with the achlorhydria, will be noted in the gruel test-meal chart (fig 1) A methylene blue enema stained the gastric fluid a very pale green, confirming the presence of a fistulous track but suggesting a narrow and perhaps a tortuous communication.

A "barium enema" showed a filling defect at the middle of the transverse colon, but no barium passed into the stomach the film showed a general dilatation of the small bowel with fluid levels in the coils

The film series after a "barium meal" defied interpretation The stomach had a constant hour glass deformity The pylorus could not be seen, but a loop of bowel, sinuous in its medial third, appeared to conform to the duodenum and the duodenojejunal flexure as it led up to the gastric stoma Very little barium could be seen in the small bowel, which was grossly dilated with many fluid levels in the coils (fig 2) Once again radiological studies failed to demonstrate a fistulous leak from the stomach but we imagined that stomach and colon were possibly united by a narrow and irregular communication of inflammatory origin too slender to admit the barium.

Investigation of the patient's physiology in preparation for a laparotomy yielded the following results

April 24 *Weight* 9 st. 8½ lb
April 25 *Urine* No sugar no albumin Specific gravity 1015 Culture sterile
April 25 *Fæces* Very pale, soft, offensive stool Undigested muscle fibres present. No fat globules
Blood-count Hæmoglobin, 94%, erythrocytes, 5,150 000 colour index 0 91 erythrocyte sedimentation rate 1 mm in 1 hour (Westergren) no anisocytosis or poikilocytosis or hypochromia, leucocytes 6100, neutrophils 45%, lymphocytes 52%, monocytes 2% eosinophils 1%
Serum proteins Total 4 11 g albumin 1 92 g, globulins 2 19 g per 100 ml
Serum-calcium 8 2 mg per 100 ml
Serum potassium, 15 5 mg per 100 ml
Serum sodium 15 0 mg per 100 ml
Blood urea 34 mg per 100 ml
Wassermann and Meinicke reactions, negative
May 13 *Fat in fæces* On a low fat diet the total weight of three days dried fæces was 235 g neutral fat 0·4% fatty acids 2 6%, soaps 7% and total fat 10% of dried weight, split fat 96% of total fat.
Urinary diastase, 3 units
Glucose tolerance (fig 3)

His weight in health had been 12 st 4 lb thus he was nearly 3 st below weight despite the œdema fluid on board

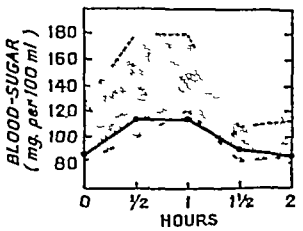

Fig 3—Glucose-tolerance curve (April 24, 1949)

During the period between his admission and his operation he became rather worse, the serum protein and the glucose tolerance curve (fig 3) remaining depressed despite a high protein diet with folic acid and vitamins The ascites seemed to increase in keeping with a fall of serum protein to 3 9 g per 100 ml

Laparotomy

After preliminary blood-transfusion a laparotomy was done on May 20, 1949, using thiopentone, cyclopropane, and intercostal block.

After excising the epigastric right paramedian scar, the dense adhesions between abdominal wall, colon, stomach, and liver made access to the general coelomic cavity time consuming and laborious, but a limited approach liberated about 12 pints of clear pale ascitic fluid. The abdominal wall, omentum, and the other viscera were glassy with œdema. Assuming a gastrocolic fistula in the dense adhesions, and as his condition began to fail, a right subhepatic defunctioning colostomy was made and the wound was closed—without getting a helpful inspection of the set-up of the abdominal viscera The colostomy was opened forthwith

He was unshaken by this procedure, but the colostomy produced stools of the same quality as before, and during the next week he belched wind as repelling as ever On May 27 the colostomy failed to act and he became distended, and on the 28th he was in distress from distension though he did not vomit. The intestine was obviously obstructed.

Second Operation

At the second operation (May 28) the anæsthetic was as before, and the incision was right low paramedian. Many pints of free fluid were removed The small bowel throughout its length was at least 4 in in diameter and much congested. The stomach above and the cæcum below could not be found. When all the small gut was exteriorised the stomach was found behind it, anastomosed at its greater curvature to the ileum 4 in from the ileocæcal valve, the stoma was 3 in. long and the terminal ileum below it had a twist through 360° which almost obstructed it The operator must have had great difficulty in forming the union, for the ileocæcal bowel and the stomach were stretched across the spine and inferior vena cava to meet each other In fact the vena cava was partly collapsed by the band of bowel

Everything was explained the nutritional disorder by the virtual exclusion of the small intestine, the offensive eructations and the infected gastric juice by the stoma, the recurrent distension by the twisted ileal termination, the failure to vomit by the ileum above the anastomosis serving as a storehouse for food leaving the stoma until it could be forced through the narrows of the twisted bowel The X ray appearances now bore interpretation the narrow track in the position of the duodenum was the ileocæcal segment rotated and distorted on its way to the gastric stoma

We relieved the condition by separating stomach and ileum, closing the gastric and ileal stomata, and making an ileo ileostomy above and below the site of the stoma as seemed best under the difficult circumstances of intestinal obstruction The stomach retracted to the upper abdomen and was not seen again, the coils of gut were deflated by needle puncture and returned to the abdominal cavity

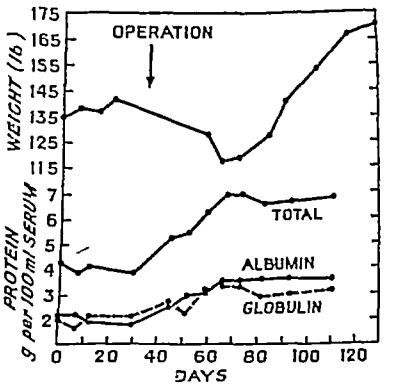

Fig 4—Progress towards recovery after operation

Progress

From now onwards this man made headway to full health The colostomy spur was duly crushed and the fistula closed. The dropsy ebbed rapidly and could not be made out by June 20 By Aug 15 his appetite, hard to satisfy since the beginning, became voracious and it remained so during the period of recovery He has exchanged a state of emaciation for a portly bearing, and apathy and resignation for a sanguine view of life His stretched abdominal muscles have regained their postural tone and voluntary control, while the hydroptic distortion of his legs has left no abnormal contours behind Within a few days the mucosa of his mouth and tongue had healed and his stools had become formed and altogether normal if a little constipated In fact, it is remarkable that tissues and vital organs for so long the subjects of distortion, can recover so completely and so rapidly

DISCUSSION

In this patient the signs and symptoms attributed to sprue were caused by a surgical operation which prevented food from passing through the small intestine and therefore abolished its action in digestion

The patient's progress to recovery is portrayed graphically in fig 4 The gain in weight before his restorative operation was consonant with an increase in œdema, loss of condition, and a synchronous fall in serum protein As the proteins returned after operation to their normal values and proportions, so the hydroptic tide ebbed and his weight fell to its minimum, but from the time when his serum was saturated he was, so to say, allowed to transfer proteins to other uses, and it was from this point that his weight increased steadily to that which he carried about in health He needed some six weeks to accomplish this (tables I and II)

The anatomical restoration of the alimentary tract did not, however, bring a perfect return of the physiological

TABLE I—WEIGHT VARIATIONS, APRIL–SEPTEMBER, 1949

Date	Lb	Date	Lb
April 24	134	July 10	124
May 1	137	July 17	130
May 8	136	July 24	142
May 14	143	Aug 7	152
June 26	118	Aug 21	166
July 3	119	Sept 10	168

economy Not only the stomach but also the œsophagus and the saliva had become chronically and profusely infected with *Bact coli*, and though the saliva was free of alien organisms by Sept 12 the stomach was still heavily infected four months after operation, neither had free hydrochloric acid returned, though the total acid was much lower By January, 1950, the stomach was aseptic and free HCl was present in the secretion On the other hand the glucose tolerance test became normal between Aug 10 and Sept 12 Not only glucose but lævulose absorption had been depressed (fig 5), a tolerance test on July 17 had shown depressed absorption of fructose, in comparison with the normal curve in tropical sprue (Maegraith et al. 1945)

The reasons for the abnormal carbohydrate absorption are not clear It persisted long after the surgical destruction of the fistula and after the patient had recovered a good measure of health, but it cleared in spite of a lusty upper-alimentary infection with concomitant radiological evidence of jejunitis Moreover, in a case of tropical sprue with characteristically disordered protein and carbohydrate absorption, we found that cultures of gastric fluid were negative

The comparatively long persistence of achlorhydria for all functional purposes is in contrast with the appearance of hyperchlorhydria within twelve days in our cases of true gastrocolic fistulæ where surgical separation without gastrectomy has been undertaken Perhaps the presence of a large stoma for over four years causes profound, and possibly lasting, changes in the gastric mucosa However, neither these changes nor the infection hindered

TABLE II—SERUM PROTEINS (G PER 100 ML.) APRIL–SEPTEMBER, 1949

Date	Total	Albumin	Globulin
April 25	4 3	2 23	2 07
May 2	3 92	2 23	1 69
May 7	4 11	1 92	2 19
May 24	3 92	1 76	2 16
June 8	5 28	2 54	2 72
June 15	5 46	3 2	2 26
June 22	6 31	3·05	3 26
June 30	6 97	3 58	3 39
July 6	6 53	3 58	2 95
July 24	6 6	3 6	3 0
Aug 10	6 7	3·6	3 1

protein absorption from the time of the final operation Perhaps the loss of the pancreatic ferment had been the deciding factor in preventing protein assimilation Without question the œdema was nutritional, according to Davis and Getzoff's (1942) classification the condition was a prehepatic hypoproteinæmia Fig 4 illustrates the loss of weight as œdema disappeared and serum protein rose Perhaps mechanical pressure by the anastomosis on the inferior vena cava added to the hydropsis of the lower limbs

Our conclusions on fat assimilation cannot be dogmatic, for the amount of fat in the stools was limited by the patient's inability to tolerate fat in his food Even on his fat-free diet however the quantity of fat in the stools was appreciable and the raised split/unsplit fat ratio may signify disordered fat digestion Hinds Howell (1945) has pointed out that in early cases of sprue the total percentage is often within normal limits whereas the split/unsplit fat ratio may be raised above 3/1 Restoration of the normal channel, giving the food access to the pancreatic lipase and the bile, was sufficient to correct fat absorption

Our patient showed no deficiency in the serum-calcium and serum phosphorus, nor did he suffer from tetany Maegraith et al (1945) have pointed out that, though calcium absorption may be unaffected in cases of sprue syndrome in tetany, the blood magnesium may be between 0 75 and 1 2 mg per 100 ml. Our patient's long bones were not rarefied In fact, the mineral metabolism observed seemed scarcely interfered with Even the blood picture was normal

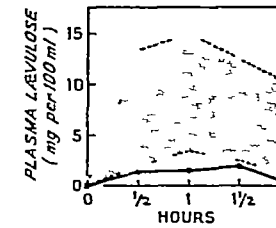

Fig 5—Lævulose-tolerance curve (July 15 1949)

Clinical signs of vitamin deficiency were confined to the tongue and mouth He had a "magenta" and a psilotic tongue, and if these are signs of hyporiboflavinosis they were the only ones Corneal and circumcorneal capillary injection were absent, but Stannus (1944) does not esteem these true signs of this particular deficiency

Similar disorders of nutrition from mechanical causes in the alimentary tract were collected by Benker and Hammet (1939) Izod Bennett and Hardwick (1940) cast their net more widely and included cœliac disease, idiopathic steatorrhœa, tropical sprue, and mechanical abnormalities of the intestinal tract under the generic title of "ileojejunal insufficiency" (To this list may be added blockage of the mesenteric lacteals—e g, by lymphadenoma or metastatic carcinoma—which affects assimilation of fat but not of other food constituents) Too little heed has been given to Bennett and Hardwick's paper, which collects a medley of disorders which have the same site in the wall of the small bowel, and give rise to much the same symptoms and signs With all this resemblance, however, they may differ widely in their morbid physiology one patient may have a normal sugar metabolism and a disordered protein assimilation with deficiency of several vitamins, while another case, clinically similar, may show a quite different combination of changes Thus Cosh (1944) and Holman (1944) describe cases of recovery from massive resection of the small bowel with quite diverse and unpredictable physiological changes

The disastrous complications we report will be avoided if in selecting a loop of intestine for anastomosis in gastro enterostomy (with or without gastrectomy) the surgeon makes quite sure, by inspection, that it is the highest loop of jejunum To select a segment of bowel simply because one end of it is taut will lead, sooner or later, to selection of the terminal ileum, since both ends of the small intestine are fixed and they are less than six inches apart

Finally it must be said that if this surgical misadventure engendered much distress, it also relieved the patient of his duodenal ulcer

SUMMARY

In a man of 48 a grave illness suggestive of sprue dated from a gastro enterostomy performed more than three years previously for duodenal ulcer Laparotomies revealed that the stomach, instead of being anastomosed to the highest loop of jejunum, had been joined to the ileum only 4 in above the ileocæcal valve Virtually the whole of the small intestine had thus been excluded from the functional alimentary tract

After a restorative operation, recovery was fairly rapid. Abnormalities in carbohydrate absorption disappeared before the gastric infection was overcome

Many other causes can produce similar manifestations of ileojejunal insufficiency In this variegated clinical

group, the clinical appearances are generally similar, but the patients may show widely different metabolic changes

Our thanks are due to the Director General of Medical Services of the Ministry of Pensions for permission to publish this case

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ILEOJEJUNAL INSUFFICIENCY

AN UNUSUAL CASE OF TROPICAL SPRUE

C F J CROPPER
O B E, F R C P E
SENIOR PHYSICIAN

A M CLARK
M B
MEDICAL OFFICER

MINISTRY OF PENSIONS HOSPITAL, RONKSWOOD, WORCESTER

THE following fatal case of tropical sprue had somewhat atypical features

CASE RECORD

The patient, an ex soldier aged 39, was admitted on March 10, 1949, with swelling of the legs and genitalia, slight soreness of the tongue, and loss of weight (28 lb in twelve months)

History

Arriving in Bombay from the United Kingdom on July 27, 1945, he was treated in hospital for amœbic dysentery in August and was drafted to Hong Kong in September In October he was again admitted to hospital, and with rest he gradually improved He returned to this country with his unit in September, 1946, and during the voyage, like most of the troops on board, he had bowel disturbances

The diarrhœa still present, he started work as a butcher in January, 1947, but had to give this up in March, 1948, because of swelling of the legs He was admitted to a civil hospital and treated with 'Casydrol' by mouth and with 'Plexan' for a month In December, 1948, he became completely bedridden with diarrhœa and swollen legs Folic acid was given for three months, and shortly after that he came under our care

Examination and Investigations

On admission he was passing some 12 stools daily They were particularly foul smelling, usually watery, they often tended to be greasy and bulky but seldom gassy His appetite was phenomenal There was much abdominal distension with gas, but no voiding of wind or belching His gaunt and wizened facies contrasted strongly with his bloated ascitic abdomen and grossly dropsical legs (The circumference of the calves was 15½ in.) His tongue was congested and atrophic and fissured, but not ulcerated

A blood count showed hæmoglobin 84%, and white cells 6200 per c mm (differential white cell count normal) The stools were negative for pathogens both microscopically and on culture the urine was free from protein, sugar, or significant deposits A gruel test-meal showed complete achlorhydria, and the gastric contents were sterile on culture Blood urea 28 mg per 100 ml A glucose tolerance curve was within normal limits, with a renal threshold of 108 mg per 100 ml

Barium meal and enema excluded gastrocolic fistula, and showed none of the fragmentation of the opaque medium reported in sprue There was considerable dilatation of the small intestine Sigmoidoscopy showed a moderate granularity of the mucosa only Urinary diastase in a 24 hour specimen was 8 units per ml of urine, with a daily output of 7360 units

Fæcal fats on a low fat diet were neutral fat 5 5% fatty acids 6 9%, soaps 24 2%, total fat 36 6% of dried weight, split fat 85% of total fat

Course

The four months' battle against increasing inanition is illustrated as well by the serum protein estimations as by any other figures

Date	Treatment (intravenous)	Serum albumin (g per 100 ml)	Serum globulin (g per 100 ml)
March 11	—	2 3	3 4
13	1200 ml casydrol	—	—
20	—	2 5	2 9
21	1800 ml casydrol	—	—
24	—	3 9	3 0
April 6	—	1 7	4 3
May 17	—	2 2	3 2
18	1200 ml blood	—	—
June 3	—	1 9	2 3
17	—	1 6	2 7
July 7	—	1 4	2 7
" 8	1200 ml blood	—	—
	1200 ml plasma	—	—

The level of proteinæmia seemed to us to be centre of the battle The patient was kept strictly on Hamilton Fairley's graded diets, which are high in protein and low in fat and carbohydrate contents Starting with diet I, he proceeded steadily up to diet V, which he was taking within a fortnight of his death Through almost the whole period, folic acid and ferrous sulphate were given in orthodox dosage, though the amount of the former was increased to 200 mg per day from July 1 It may be that parenteral folic acid, which was only then becoming available, might have had some effect

The slow downward progress was punctuated by two untoward episodes (1) a right middle lobe pneumonia, developing on March 16 and responding well to 'Sulphamezathine,' and (2) on April 12, typical hypocalcæmic tetany requiring 54 ml of 10% calcium gluconate intravenously to abort it The usual measures were adopted to raise the serum calcium, and though on April 20 the level was only 4 9 mg per 100 ml no further attacks occurred

In mid April, a three-day fat balance test was done and showed that *all* the ingested fat (40 g daily) was being excreted in the fæces 59% of it was split

On July 8, the patient was noted to be looking even paler than usual, and though he apparently was not feeling unwell his blood pressure was imperceptible and his pulse rate 50 per min The transfusions and infusions shown above were given, and there was marked improvement Next day he was sitting up enjoying his breakfast when he suddenly became cyanosed and passed into coma, and he died within two hours

Necropsy

Dr P Kidd, of Worcester Royal Infirmary, reported as follows "Gross wasting of subcutaneous tissues, with signs of dehydration Tongue smooth and atrophic *Lungs* partial collapse of both lower lobes with some purulent bronchitis *Heart* myocardium flabby, valves and chambers normal *Stomach* mucous membrane smooth and atrophic *Small intestine* paper thin wall, almost complete absence of normal mucosal folds, atrophy of Peyer's patches *Large intestine* similar changes but in lesser degree *Mesenteric glands* a few calcified, no evidence of active tuberculosis *Liver* normal *Spleen* atrophic (weight 2½ oz) No other abnormalities *Cause of death* inanition tropical sprue"

COMMENT

Though the frequently watery and very foul stools which were a feature of this case have been observed in sprue, they were very different from the bulky, greasy, pale, and gassy stools usually described It was surprising to find a normal glucose tolerance curve with such gross hypoproteinæmia Also one would have expected a greater degree of anæmia, and this was not markedly macrocytic Finally, such extreme impairment of fat absorption as was evident here is very rarely seen it suggested revision of our diagnosis in favour of a lymphosarcomatous or other lacteal destroying lesion

Up to the time of necropsy, we often discussed the possibility of a gastrocolic fistula, despite the negative X ray findings and sterile culture of gastric juice The lack of response to "specific" measures kept us doubtful until the end

Our thanks are due to the Director General of Medical Services of the Ministry of Pensions for permission to publish this case

Preliminary Communication

COMPOSITION OF LIQUOR AMNII IN HÆMOLYTIC DISEASE OF NEWBORN

THE antenatal prediction of hæmolytic disease in the children of immunised Rh negative mothers being notoriously unreliable, attempts have been made to obtain assistance from examination of the liquor amnii

If the liquor amnii in late pregnancy is a mixture of fœtal urine and the secretion of the amnion, in hæmolytic disease bile pigments, amino acids, or iron might possibly be found in the liquor Liquor amnii has been obtained from cases of pre eclampsia and postmaturity as well as from suspected cases of hæmolytic disease, high rupture of the membranes being used in St Mary s Hospitals, Manchester, as a method of inducing labour Care has been taken to avoid contamination of the liquor with maternal blood, and investigations have been made within twenty four hours of obtaining the samples All tests have been made on centrifuged liquor

METHODS AND RESULTS

Bile pigments—Attempts to demonstrate the presence of bile pigments with Fouchet's reagent and the van den Bergh reaction proved negative in all cases, including two in which the liquor had the characteristic golden colour seen in severe hæmolytic disease

Urobilinogen—Tests for urobilinogen (Watson 1937) have also been negative This does not exclude the presence of urobilinogen, since protein is thought to inhibit Erhlich's reagent (Wilson and Davidson 1949)

Urobilin—Schlesinger's test for urobilin has also been negative in all cases

Amino-acids—Tests for amino acids by paper chromatography have proved disappointing, because the liquor seems to contain very little amino acid. No difference has been discovered between affected and unaffected babies

Iron—The presence of iron was first sought with the prussian blue reaction Macroscopically this has always been negative, but the Gomori technique on dried "smears" of liquor shows that iron is always present In cases of rhesus incompatibility the amount of iron is always increased, and the relative increase is a fairly reliable guide to prognosis The method is, however, somewhat troublesome, and the results are not always easy to interpret Simpler methods have therefore been sought, and the "spot reagents" produced and described by the British Drug Houses (1949) have been studied.

Tests with 'Ferron' (7-iodo 8 hydroxyquinoline 5-sulphonic acid) have been uniformly negative, indicating that the iron is present in the ferrous state.

αα'-Dipyridyl has been tried but has not proved so satisfactory as thioglycollic acid (mercaptoacetic acid) To 5 0 ml. of liquor amnii containing 1 drop of thioglycollic acid (B.D H) is added 0 5 ml. of ammonia (0 880), a change to purple indicates the presence of iron

The following conclusions have been drawn from the results of 30 determinations (1) if there is no purple, the child will be unaffected at birth but may become anæmic after the end of the first week of life, (2) if there is a faint purple, the child will be unaffected at birth but may soon become jaundiced and is almost always anæmic by the end of the first week and (3) if there is a well marked purple, the child will be affected at birth, and the prognosis is not good

The colour seems to be due to ionised iron in the liquor amnii because the amount of iron obtained after incineration of the liquor is appreciably greater No purple is given by meconium in solution, although this too has been shown to contain iron on incineration No false negative reactions have been obtained, but one false positive was found in an abortion at 16 weeks and the cause of the error is unknown

SUMMARY

The precise origin of liquor amnii is doubtful, but it certainly seems to contain some fœtal urine

A test for iron in liquor amnii is described which seems to have some prognostic value, but often the hæmolytic processes are found to be too far advanced when labour is induced Possibly, if the test were applied to liquor obtained by paracentesis in the antenatal period, the induction of labour could be timed more accurately

Thanks are due to Prof W I C Morris for suggesting that the presence of iron should be sought and for much help in the preparation of the paper

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D C A BEVIS
M.B Manc, M R C O G
Senior Registrar St. Mary s Hospitals
Manchester

Reviews of Books

Modern Trends in Obstetrics and Gynæcology

KENNETH BOWES M D, M S, F.R C.S, obstetric physician St Thomas s Hospital, London Butterworth 1950 Pp 300 60*s*

A SERIES of books on Modern Trends is clearly justified, and the publishers are to be congratulated on their production of this one, which has good binding, paper, type, and illustrations Mr Bowes points out that the diverse researches of the past fifteen years which bear on fundamental problems of gynæcology and obstetrics make it necessary to include chapters from contributors not engaged in clinical work in this branch of medicine He deserves much praise for the labours which have resulted in the collection of some fifty articles They all have the same arrangement, and the main divisions and sections are prefaced by comparable type The material, on the other hand, is varied in the extreme, and the value of a particular chapter depends largely on the particular reader

Some can be assessed on the excellence of their subject matter among these are those dealing with anatomy, pituitary trophins and steroid hormones, fœtal physiology, lactation, cytology, and tuberculosis of the pelvic organs Others will be of the greatest help to those engaged in clinical work in this category are the chapters on the rhesus factor, disproportion, anuria, hæmorrhage in pregnancy and labour, pregnancy and diabetes mellitus, tuberculosis and pregnancy, endocrine therapy, venous thrombosis, and the law in relation to obstetrics and gynæcology This last, by Karminski and Trevor Reeve could usefully be read by all who practise, or hope to practise, medicine

Many of the remaining articles evoke more mixed feelings Those on endometriosis, abortion, radiotherapy, prolapse, toxæmias, and surgical shock are accurate and orthodox accounts which might be included in any textbook Others deal with highly specialised and varied topics such as radio isotopes, sex and intersexuality, statistical and genetical problems, social factors and tubal motility. A few hardly seem to merit publication at all—either because the information they contain does not support the book title or because it is not generally accepted, or because it is difficult to discover Lastly there are several articles whose value is seriously limited by their brevity More could well be written in those concerned with psychology, heart-disease, anæmia radiology, and urology A new chapter on diet in pregnancy is suggested

Naturally it is impossible that nearly fifty authors should contribute articles of equal merit, and without doubt this is a valuable first edition. The editor will presently have an opportunity to cut away some dead wood and to stimulate the growth of promising yet hesitant shoots

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COMMENT

Though the frequently watery and very foul stools which were a feature of this case have been observed in sprue, they were very different from the bulky, greasy, pale, and gassy stools usually described It was surprising to find a normal glucose tolerance curve with such gross hypoproteinæmia Also one would have expected a greater degree of anæmia, and this was not markedly macrocytic Finally, such extreme impairment of fat absorption as was evident here is very rarely seen it suggested revision of our diagnosis in favour of a lymphosarcomatous or other lacteal destroying lesion

Up to the time of necropsy, we often discussed the possibility of a gastrocolic fistula, despite the negative X ray findings and sterile culture of gastric juice The lack of response to "specific" measures kept us doubtful until the end

Our thanks are due to the Director General of Medical Services of the Ministry of Pensions for permission to publish this case

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Hazards of the Aged Hip

As the average age of our population increases, so does the number of fractures of the neck of the femur and the number of senile osteoarthritic hips Moreover, thanks to chemotherapy and better technique, the old person with a damaged hip survives operation and may occupy a hospital bed for many months, thus perhaps blocking the admission of several younger patients whose restoration to full working capacity calls only for some minor surgical procedure The result is a problem of administration as well as of surgery

Fractured neck of femur is far commoner in women than men There is no mystery about this their wider pelves expose women more to traumatic coxa vara, they are less active, they are more subject for endocrine reasons to senile osteoporosis, and above all many more reach old age (by an American estimate, the expectation of life for a woman of 60 is five times that of a man of the same age[1]) Because these women usually live either alone or with a husband no longer able to care for an invalid wife, they can seldom return home until their activity is restored Hence, as they certainly ought not to occupy surgical beds a day longer than is necessary, the obvious need is for intermediate establishments—staffed by assistant nurses or even by sensible "helpers" with a sister for stiffening—to which they can be sent soon after operation There they could be visited regularly by the orthopædic consultant, and they could be recalled at once to the parent centre if need arose If operation has been performed as soon as possible after the fracture, the patient's condition is less likely to have deteriorated, with untoward developments in lungs, skin, veins, or mental state But at present, unfortunately these cases are commonly dealt with on a weekly operating-list, for no real reason other than that most consultants live away from hospital. Where there is a resident whole time staff, as in large ex municipal hospitals, standards of treatment are apt to be higher, and improvement could be expected from an increase in the number of specialised traumatic centres, where skilled surgery and radiography are always on hand and where the fracture can be treated as the emergency it is We need to regard these cases as we do those of perforated ulcer, so that by next morning the patient is sitting out by her bed with the whole of the primary treatment over

The controversy over the advisability of operating on every intracapsular fracture is settled everyone now agrees that operation is necessary As BOYD and GEORGE[1] remark, surveys of operative results are often somewhat discouraging, but "this does not alter the fact that internal fixation is the treatment of choice The mortality is lower, the patient more comfortable, medical complications less frequent, senile psychosis greatly reduced, the cost of hospitalisation diminished and the percentage of bony union greater than with any other method" Controversy now centres rather on the treatment of trochanteric fractures, on which the debate continues because both sides can cite statistics that suit them Thus EVANS,[2] comparing the results of conservative treatment with the results of fixation with a Capener Neufeld nail, concludes that routine operation has great advantages in comfort and mobility, lowered mortality, and economy in hospital beds Reviewing 1648 reported cases he shows a mortality of 33 7% with conservative treatment against 18 3% with operation The opposite view is taken by MURRAY and FREW,[3] who plead strongly for conservative management and make the telling point that any kind of selection for operation automatically deducts the corresponding mortality from the surgical figures and adds it to the conservative total, so that a grossly unfair comparison results They feel that "broadly speaking, any condition which can be treated equally well by operative or conservative methods should not be treated by operation" But this ignores hospital logistics Though intrinsically, shortage of beds is no argument for operating on a case which can be dealt with just as well otherwise, it is clear that the quicker form of treatment represents a saving in hospital days which can be used to good purpose by younger members of the community

Concerning the purely technical aspects of inserting a Smith-Petersen pin across the intracapsular fracture, one of the best simple descriptions remains that of BANKART[4] VAN GORDER[5] has reminded us that the method of reduction should be suited to the individual fracture A routine Leadbetter or Whitman reduction is not always needed, simple traction and internal rotation by hand may be sufficient, and the powerful pull obtainable with a modern orthopædic table may produce actual distraction which is maintained by the subsequent pinning especially when the pin is too horizontal. To disengage the awkward small head fragment with a projecting spur on its inferior aspect, preliminary traction in adduction may be necessary Late necrosis is especially liable to follow high fractures An immediate osteotomy of the McMurray type—the management and mechanics of which have been well described by OSBORNE and FAHRNI[6]—would be more attractive if a really reliable method of internal fixation after osteotomy made it possible to dispense with three months in a long hip spica Perhaps something on the lines of the 'geometric osteotomy" of DICKSON,[7] with its blade-plate fixation, might supply the answer

In the past great respect has been paid to PAUWELS's[8] dictum on the influence of the angle of the fracture-line on the probability of union, with its implication that in the more vertical type-III fracture bone-grafting is needed as well as pinning Perhaps we have been too much influenced by this teaching After all, as BANKART[4] points out the pin's function is to convert all forces at the fracture site into vertical ones, and he aims at this by placing the pin as nearly vertical as possible and allowing early weight-bearing to compress the fragments along the pin and not in relation to the fracture-axis BOYD and GEORGE[1] found that non union was actually rarer in type-III than in type-II cases and they point out that when the adverse shearing force has been eliminated by internal fixation there is in fact a considerably greater area of bony contact in these cases, which are usually regarded as having the worst prognosis However this may be, it is clearly desirable to obtain as much valgus as possible by over-reduction of the fracture—the prognosis is vastly improved if the inner edge of the lower fragment can be made to project in beyond

1 Boyd H B George I L *J Amer med Ass* 1948 137 1196
2 Evans E M *J Bone Jt Surg* 1949 31B 190
3 Murray R C Frew J F M *Ibid* p 204
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5 Van Gorder G W *J Amer med Ass* 1948 137 1181
6 Osborne G V Fahrni W H *J Bone Jt Surg* 1950 32B 148
7 Dickson J A *J Amer med Ass* 1948 137 1199
8 Pauwels, F Der Schenkelhalsbruch ein mechanisches Problem Stuttgart, 1935

Communicable Diseases

Editor ROSCOE L PULLEN, M D, F.A C P, professor of graduate medicine, Tulane University of Louisiana London Henry Kimpton 1950 Pp 1035 £7

Professor Pullen and some fifty contributors, most of whom are attached to Tulane University and the Charity Hospital of Louisiana, New Orleans, have produced a comprehensive and significant work on modern methods of diagnosis, management, treatment, and prevention of the wide range of diseases, acute and chronic, endemic and exotic, officially accepted as communicable, and usually "reportable," in the United States, the only major disease omitted deliberately is trypanosomiasis, so far not recorded in America

Though epidemiology is discussed, especially in the accounts of the diseases which we distinguish as "tropical," the book is written primarily from the clinical standpoint In an introductory chapter the editor deals with every aspect of the communicable diseases in general and lays stress on the changes in the management of many but by no means all of them that have been made possible by chemotherapy provided that diagnosis and the use of the appropriate chemotherapeutic agent are prompt, the period of infectivity and the duration of the illness may often be so curtailed as to permit of the patient being nursed with safety in a general ward or at home The keynote of the book is therefore "early diagnosis," and to this end the diseases are grouped according to the main presenting symptoms and signs at the time of the initial examination. Except in the group characterised by "widespread systemic manifestations," which includes diseases as diverse as rheumatic fever and plague, this arrangement results in surprisingly little ætiological dislocation and is certainly a convenience to the practitioner However this may be, the accounts of individual diseases are set out in orthodox textbook fashion and usually attain a high level of teaching Outstanding is the hundred page chapter on the rickettsial diseases contributed by ten authorities including the editor

Children, as Professor Pullen remarks, comprise the majority of patients with communicable diseases, and therefore Dr W S Sako has provided a compendious section on medical pædiatric procedures, which, apart from its intrinsic value, serves to emphasise the fact that the fields of clinical epidemiology and pædiatrics to a great extent march with each other

This admirable work more than maintains the standards of illustration and production customary in American medical textbooks

Supervoltage Roentgentherapy

FRANZ BUSCHKE, M.D; SIMEON T CANTRIL, M D, HERBERT M PARKER, M SC, from the tumor institute, Swedish Hospital, Seattle Springfield, Ill C C Thomas Oxford Blackwell Scientific Publications 1950 Pp 297 77s 6d

THIS book records the experiences of the authors since 1938, using an apparatus (installed in 1932) which was designed to operate at 800 kV, and which, though the system applied is now obsolete, has continued to provide a satisfactory radiation beam The chapters on physical considerations show the care with which dosage was measured in pressed wood models, for the evaluation of combined depth dose in multiple-field therapy, and make it possible to relate the results obtained to the doses actually delivered to the tumours

In cancer of the mouth, lesions which were regarded as too extensive for local radium therapy could be treated with single fields because of the high depth dose and the skin tolerance at 800 kV, and the proportion of good results is satisfactory With cervical lymphadenopathy the authors' experience was not more promising than when other forms of external irradiation were used In the treatment of malignant tumours of the pharynx their best results have been obtained in cancer of the base of the tongue, and in other sites supervoltage was found to give no obvious advantage It was for deep lesions, such as cancer of the œsophagus, that the high depth dose was expected to be particularly valuable, and good palliative results and an occasional cure were obtained For the treatment of cancer of the larynx a single field approach was found to be convenient, but the results were similar to those of the usual types of treatment Other sites dealt with are cancer of the bladder, where genuine advantages were found, and cancer of the breast, where the use of supervoltage did not appear to be of major importance A useful and frank chapter on cancer of the uterine cervix explains the dangers of raising large volumes of pelvic tissue to high dosage

The conclusions reached about the use of supervoltage may seem rather pessimistic, especially in view of the comparatively small number of cases treated in each of the many sites, but the authors deserve gratitude for their objective approach and unbiased observation which must help all those at present engaged in developing supervoltage techniques

The Hinge Graft or Ginglymus Implant

ARNOLD K HENRY, M.B Dubl, F.R.C S I., emeritus professor of clinical surgery, University of Egypt, professor of anatomy, Royal College of Surgeons in Ireland Edinburgh E & S Livingstone 1950 Pp 64 15s

THIS is an account, written in Mr Henry's familiar style of his experiences with a novel method of bone-grafting used in the first place for the stabilisation of paralytic deformities of joints The purpose of the hinge graft is to "guard and canalise the movements they allow" The grafts consist of "pliable strips of periosteum encrusted with bone" which are taken from the tibia and implanted in bony grooves alongside the joint It is found that a hinge forms near the centre of movement of the joint, thus giving stability by permitting movement in one plane only

The number of cases reviewed is small. The author describes the use of the graft in two patients with paralytic deformities of the feet, and in one with genu recurvatum In two patients with forearm stumps an attempt was made to use a hinge graft to form a digit In another case a hinge graft was used to replace the skeleton of a finger which had to be removed on account of bony disease

The illustrations show that in the three patients with paralytic deformities the procedure was successful in improving stability, though deformity was not fully corrected The hinge graft may find a place in the operative treatment of unstable joints, but in the foot a well planned and carefully executed arthrodesis should give a more satisfactory result. The attempts to form new digits or to replace the skeleton of a diseased digit were successful, though not always in the way intended

No attempt is made to draw any conclusions, nor does Mr Henry urge the use of the hinge graft His purpose is to describe a surgical procedure which may prove of value

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Medicine and Mankind (London Staples Press 1950 Pp 232 12s 6d)—This book was first published in 1941 and was reproduced in shorter form in 1944. It is written, it seems, for the general reader and the medical student and includes a helpful glossary of technical terms In his preface Prof Arnold Sorsby explains that any understanding of health and disease is possible only through an approach 'which visualizes the body in unstable physico chemical equilibrium, with man, nature and the social milieu as the trinity of modern medicine" His ten chapters amplifying these views end on a note of glory in the last chapter (entitled "On the Horizon of Time"), in which man is shown to be no longer the helpless plaything of the gods but to be becoming a legislator of the universe

Akute Infektionskrankheiten und Hochdruck (Stuttgart Thieme 1949 Pp 130 DM 9 60)—In this book Dr Otto Arnold, of Heidelberg propounds the thesis that both acute and chronic arterial disease may follow the acute infectious fevers which are often the precipitating factor of essential hypertension. He produces a series of case reports of patients who showed transitory hypertension during convalescence, emphasises that the blood pressure may be raised after scarlet fever without other evidence of nephritis and reports one or two cases in which progressive hypertension appeared to date from an acute infection. This view clearly does not explain the majority of cases of hypertension and tends to minimise the factor of heredity Dr Arnold believes that the organism possesses certain groups of reactions to stimuli, and, while often mixing fact and theory, he appears to be striving after the conception of stress and adaptation. In linking hypertension with stress, he is now in good company

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Fractured neck of femur is far commoner in women than men There is no mystery about this their wider pelves expose women more to traumatic coxa vara, they are less active, they are more subject for endocrine reasons to senile osteoporosis, and above all many more reach old age (by an American estimate, the expectation of life for a woman of 60 is five times that of a man of the same age[1]) Because these women usually live either alone or with a husband no longer able to care for an invalid wife, they can seldom return home until their activity is restored Hence, as they certainly ought not to occupy surgical beds a day longer than is necessary, the obvious need is for intermediate establishments—staffed by assistant nurses or even by sensible "helpers" with a sister for stiffening—to which they can be sent soon after operation There they could be visited regularly by the orthopædic consultant, and they could be recalled at once to the parent centre if need arose If operation has been performed as soon as possible after the fracture, the patient's condition is less likely to have deteriorated, with untoward developments in lungs, skin, veins, or mental state But at present, unfortunately these cases are commonly dealt with on a weekly operating list, for no real reason other than that most consultants live away from hospital. Where there is a resident whole-time staff, as in large ex-municipal hospitals, standards of treatment are apt to be higher, and improvement could be expected from an increase in the number of specialised traumatic centres, where skilled surgery and radiography are always on hand and where the fracture can be treated as the emergency it is We need to regard these cases as we do those of perforated ulcer, so that by next morning the patient is sitting out by her bed with the whole of the primary treatment over

The controversy over the advisability of operating on every intracapsular fracture is settled everyone now agrees that operation is necessary As BOYD and GEORGE[1] remark, surveys of operative results are often somewhat discouraging, but "this does not alter the fact that internal fixation is the treatment of choice The mortality is lower, the patient more comfortable, medical complications less frequent, senile psychosis greatly reduced, the cost of hospitalisation diminished and the percentage of bony union greater than with any other method" Controversy now centres rather on the treatment of trochanteric fractures, on which the debate continues because both sides can cite statistics that suit them Thus EVANS,[2] comparing the results of conservative treatment with the results of fixation with a Capener-Neufeld nail, concludes that routine operation has great advantages in comfort and mobility, lowered mortality, and economy in hospital beds Reviewing 1648 reported cases he shows a mortality of 33 7% with conservative treatment against 18 3% with operation The opposite view is taken by MURRAY and FREW,[3] who plead strongly for conservative management and make the telling point that any kind of selection for operation automatically deducts the corresponding mortality from the surgical figures and adds it to the conservative total, so that a grossly unfair comparison results They feel that "broadly speaking, any condition which can be treated equally well by operative or conservative methods should not be treated by operation" But this ignores hospital logistics Though intrinsically, shortage of beds is no argument for operating on a case which can be dealt with just as well otherwise, it is clear that the quicker form of treatment represents a saving in hospital days which can be used to good purpose by younger members of the community

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the head and support it—and DEPALMA[9] reports encouraging results with removal of bone from the upper and outer aspect of the shaft fragment by a wedge osteotomy at open operation, so that the head can be reduced into a valgus position before pinning Among 40 cases treated in this way there was no operative mortality, bony union followed in 90%, and necrosis in only 18%

The problem of cancellous bone destruction on the back of the femoral neck remains as with the Colles fracture, reduction sometimes leaves a gap due to trabecular destruction which makes for redisplacement, and it might sometimes be wiser to pin the fracture in some permanent external rotation In the light of what we now know about the influence of steroid hormones on osteogenesis and epiphyseal fusion, it would be reasonable to try more extensively the effects of these substances on bony union

We may hope, with BOYD and GEORGE,[1] that the fractured femoral neck is no longer the "unsolved fracture", and the difficulty now is not so much to obtain union as to deal with the subsequent osteo arthritis, whether or not this develops on a basis of gross necrosis of the head Here we touch on the problem—too often considered quite separate—of the senile osteoarthritic hip A well-performed pseud arthrosis is excellent treatment for osteoarthritis of the hip[10], yet, though fractures of the femoral neck are a far greater menace to functional recovery, we rarely see them treated in the first place by pseud arthrosis There is, of course, reluctance to perform major open hip operations on the aged, but skilled anæsthesia, chemotherapy, and judicious transfusion nowadays enable these patients to withstand such intervention surprisingly well The unspoken objection is to performing for a fresh fracture an operation which does not restore the anatomical status quo and which was designed to relieve a different pathological entity of slower evolution We should, however, weigh the arthroplastic procedure, whatever it may be, not against the patient's condition before fracture (for who can guarantee to restore that ?) but against the possible complications in the form of non union, arthritis, and necrosis If this view is taken, more value may be attached to the primary treatment of suitable intracapsular fractures by some kind of arthroplasty, whether this takes the form of a pseudarthrosis—possibly stabilised by an abduction osteotomy—or of the resection reconstruction practised by the brothers JUDET,[11] who remove the head of the femur and replace it with an acrylic prosthesis

Population and Food-supply

AT the end of the 18th century a Surrey squire, impressed no doubt by the recent improvements in agriculture and the earliest signs of that wealth which the Industrial Revolution was later to unfold, became a disciple of GODWIN and a firm believer in the perfectibility of human society He was wont to discuss his views with his son, and the son, with a proper suspicion of paternal opinion, examined them and came to the reverse conclusion For, as the son argued, any temporary or local improvement in human living conditions will increase a population faster than corresponding agricultural developments can increase their food supply Hunger and starvation, with their concomitant war and pestilence, will then automatically set back the advance and check the population growth these disasters are inescapable features of human society which, by its very nature, can never become stable This argument, started in the MALTHUS family (in 1798 the son published his views in a brilliant essay),[1] continues today and is still hotly debated

The Food and Agriculture Organisation (F.A O) of the United Nations attempts regularly to collect data necessary to assess the complex relations between contemporary population changes and agricultural production CHATFIELD, SCOTT, and MAYER,[2] three members of the Nutrition Division of F A O, have set out the changes in each over the last decade, drawing their data largely from an official United Nations survey[3] It was estimated that between 1938 and 1948 the world population had gone up from 2174 to 2354 million—an increase of 8 3% For agricultural statistics, most of Africa and the U S S R do not provide data suitable for analysis In the remainder of the world the population, now 1777 million, has increased by 8 4%, but the figures for agricultural production, when translated into nutrients, show a corresponding increase in available calories of only 0 7% and in proteins of but 1 4% The aggregate daily supply of available calories has fallen from 2390 per caput before the war to 2220 in 1948 The difficulties in collecting international statistics are so great that individual figures must be taken with caution, but beyond reasonable doubt there has been a fall off in the average amount of food available per head throughout the world

In the United Kingdom the available calories have changed little, from 3000 in 1938 to 2980 in 1948 Within our country the main alteration has been in the distribution of food It is certain that the economically unfavoured are eating more and the wealthy less today than in 1938 This levelling is a factor which leads to social stability and prevents unrest Unfortunately in the international field there is no sign of a corresponding levelling At the top, the U S A, Canada, and one or two other countries, well supplied in 1938, have more calories available per head for home consumption now At the bottom, more and more peoples have sunk to the level of semi starvation Whereas formerly 22% of the total world population lived at or below the level of 2000 calories, this proportion has now risen to 35% The increase in the inequality of distribution is the most disturbing feature of the world food picture and presents a fundamental problem in international politics, for all experience shows that in any country whose population is subsisting at the 2000 calorie level or lower political unrest is certain and civil war and disturbance an ever present threat

CHATFIELD, SCOTT, and MAYER refuse to take sides either with the optimists or with the prophets of doom They point out that the last decade was an abnormal one, and rightly state that it cannot be taken as a certain index of future trends Fortunately for our temporary peace of mind, most of us are optimists and refuse to believe that periods of war are "normal"

9 DePalma A F J Bone Jt Surg 1950 32B 653
10 Taylor R G Ibid 1950 32B 161
11 Judet, J Judet R Ibid p 166

1 Malthus T R An Essay on the Principles of Population as it affects the Future Improvement of Society with Remarks on the Speculations of Mr Godwin M. Condorcet and other Writers 1798
2 Chatfield C Scott, M. L Mayer J Milbank mem. Fd Quart 1950 28 103
3 The State of Food and Agriculture a Survey of World Conditions and Prospects Washington 1949 Pp 138 Obtainable from H.M. Stationery Office. 10s 6d

We might, however, have difficulty in convincing MALTHUS *fils* that peace was the normal state of human society Certainly, unless we contrive to manage international affairs in such a way that both agricultural production and food distribution are greatly improved, we shall be face to face with war, pestilence, and famine on the grand scale again, as he predicted Meanwhile we can at least be grateful to the F.A O workers for putting the facts so concisely before us

Gas in the Alimentary Tract

As might be expected, the distressing symptom of flatulence engaged the attention of the ancients, and HIPPOCRATES is said to have written at length on the "winds" Today we know quite a lot about the composition of gases in the stomach and intestine, but less about their source The main constituents of gas in the stomach are carbon dioxide, oxygen, and nitrogen As the gas passes down the intestinal tract the nitrogen remains unabsorbed, and other substances, such as methane and hydrogen sulphide, are added The average volume of flatus normally passed each day has been estimated at about 0 5–1 litre,[1] with a postprandial evacuation of about 100 c cm [2], and in one test the flatus was composed of carbon dioxide 10 3%, oxygen 0 7%, methane 29 6%, and nitrogen 59 4% [3]

Gas in the intestine has been variously explained as due to fermentation of intestinal contents, diffusion of blood gases into the lumen, interference with absorption by the blood, and swallowing of atmospheric air MADDOCK and his co-workers [4] are convinced that the main source is ingested air Normally the superior œsophageal sphincter is closed except during swallowing, but it may be relaxed consciously (by "air suckers") or unconsciously (by aerophagics), who, breathing against a closed glottis, produce a negative pressure of up to 30 cm in the œsophagus and stomach [5] Diliberate repeated belching depends on knowing how to relax the superior œsophageal sphincter and then trying to breathe in with the glottis closed, the unintentional frequent belcher probably does much the same MADDOCK and his associates have found that with deliberate belching the amount of air aspirated into the œsophagus was greater than the amount eructated, and so some air probably passed into the stomach A somewhat similar mechanism accounts, they suggest, for the gastric distension sometimes accompanying the early stages of anæsthetisation This has sometimes been attributed to repeated swallowing [6], but in MADDOCK's series of 23 cases submitted to inhalation anæsthesia for laparatomy, swallowing movements during induction averaged only 1 5 These investigators believe that relaxation of the superior œsophageal sphincter with respiratory aspiration is the cause, and they indict curare, positive-pressure anæsthesia, and obstruction of the airway as aggravating factors. They cite the case of a patient who, under sodium thiopentone anæsthesia for a minor operation, developed an enormous pneumoperitoneum following spontaneous rupture of the stomach This had been distended by air heard by those in the operating-theatre as it entered the œsophagus with each inspiration As regards postoperative distension, unlike BEGG,[7] who has postulated derivation of gas from the blood by "intestinal respiration," MADDOCK and his colleagues insist that this is traceable once again to ingested air, and they are satisfied that the colonic meteorism that may come on rapidly with retrograde pyelography is due to the same mechanism In support of this they have confirmed MAGNUSSON's [8] observation that air may pass rapidly through the small intestine In normal subjects ingested air was found to reach the cæcum in an average of 14 6 minutes and to be passed as flatus in 24 1 minutes In patients undergoing pyelography who were submitted to continuous gastric suction considerable volumes of air were aspirated from the stomach, and when this was kept empty, intestinal gas did not increase Moreover, nervous patients had three times as much air aspirated from their stomachs as calm patients These nervous patients breathed more deeply at painful stimuli, and the gas return was greatest during these periods A previous study of normal subjects had proved that, as the depth of respiration increased, so did negative intra-œsophageal pressure and consequently the rate of aspiration of air into the œsophagus

There is a good deal of outside evidence to support these views Thus the efficacy of continuous gastric suction in preventing postoperative distension [9] is most easily explained in the light of MADDOCK's argument, gas appearing speedily in the upper alimentary tract of newborn infants—sometimes within 15 minutes of birth [10] is most probably ingested air, and the inconspicuousness with which the laryngectomised patient collects air in his œsophagus before articulating reflects the ease with which the "air-sucker" may escape detection A slightly different mechanism, may, however, sometimes operate GATCH [11] has pointed out that with contraction of the abdominal muscles, relaxation of the diaphragm, elevation of the ribs, and relaxation of the superior œsophageal sphincter, a great quantity of air can rush into the stomach, and these acts, which may be performed voluntarily, explain, in his view, the ability of some to down a bottle of beer at one gulp All the same, ingestion of air, by whatever means, does not seem to account for the excessive flatus associated with eating certain foods HURST [12] maintained that in half the cases of excessive gas in the intestine the cause was fermentation due to carbohydrate dyspepsia, and that the other important cause was interference with absorption of gas by the veins of the bowel, and ALVAREZ [13] asserts that sometimes gas may be excreted from the blood into the intestine All these mechanisms may sometimes operate, but their importance in particular cases is often uncertain

1 Beazell J M. Ivy A C *J Amer digest Dis* 1941 8 128
2 Alstead S Patterson J F *Lancet*, 1948 1 437
3 Fries J A. *Amer J Physiol* 1906 16 468
4 Maddock W G Bell J L Tremaine M. J *Ann. Surg* 1949 130, 512
5 Morris C R Ivy A. C Maddock W G *Arch Surg* 1947 55 101
6 McIver M. A. Benedict, E B Cline J W jun. *Ibid* 1926, 13 588
7 Begg R C *J Urol.* 1948 59, 358
8 Magnusson W *Acta radiol Stockh* 1931 12 552
9 Singleton A O, Rogers F Houston, F G *Ann Surg* 1942 115 921
10 Paine J R Nessa C B *Surgery* 1942 11, 281
11 Gatch W D *Ann Surg* 1950 130, 535
12 Hurst A *Lancet* 1942 1 223
13 Alvarez, W C. *J Amer med Ass* 1942 120 21

the head and support it—and DEPALMA[9] reports encouraging results with removal of bone from the upper and outer aspect of the shaft fragment by a wedge osteotomy at open operation, so that the head can be reduced into a valgus position before pinning Among 40 cases treated in this way there was no operative mortality, bony union followed in 90%, and necrosis in only 18%

The problem of cancellous bone destruction on the back of the femoral neck remains as with the Colles fracture, reduction sometimes leaves a gap due to trabecular destruction which makes for redisplacement, and it might sometimes be wiser to pin the fracture in some permanent external rotation In the light of what we now know about the influence of steroid hormones on osteogenesis and epiphyseal fusion, it would be reasonable to try more extensively the effects of these substances on bony union

We may hope, with BOYD and GEORGE,[1] that the fractured femoral neck is no longer the "unsolved fracture", and the difficulty now is not so much to obtain union as to deal with the subsequent osteo arthritis, whether or not this develops on a basis of gross necrosis of the head Here we touch on the problem—too often considered quite separate—of the senile osteoarthritic hip A well-performed pseudarthrosis is excellent treatment for osteoarthritis of the hip[10], yet, though fractures of the femoral neck are a far greater menace to functional recovery, we rarely see them treated in the first place by pseud arthrosis There is, of course, reluctance to perform major open hip operations on the aged, but skilled anæsthesia, chemotherapy, and judicious transfusion nowadays enable these patients to withstand such intervention surprisingly well The unspoken objection is to performing for a fresh fracture an operation which does not restore the anatomical status quo and which was designed to relieve a different pathological entity of slower evolution We should, however, weigh the arthroplastic procedure, whatever it may be, not against the patient's condition before fracture (for who can guarantee to restore that ?) but against the possible complications in the form of non-union, arthritis, and necrosis If this view is taken, more value may be attached to the primary treatment of suitable intracapsular fractures by some kind of arthroplasty, whether this takes the form of a pseudarthrosis—possibly stabilised by an abduction osteotomy—or of the resection reconstruction practised by the brothers JUDET,[11] who remove the head of the femur and replace it with an acrylic prosthesis.

Population and Food-supply

AT the end of the 18th century a Surrey squire, impressed no doubt by the recent improvements in agriculture and the earliest signs of that wealth which the Industrial Revolution was later to unfold, became a disciple of GODWIN and a firm believer in the perfectibility of human society He was wont to discuss his views with his son, and the son, with a proper suspicion of paternal opinion, examined them and came to the reverse conclusion For as the son argued, any temporary or local improvement in human living conditions will increase a population faster than corresponding agricultural developments can increase their food supply Hunger and starvation, with their concomitant war and pestilence, will then automatically set back the advance and check the population growth these disasters are inescapable features of human society which, by its very nature, can never become stable This argument, started in the MALTHUS family (in 1798 the son published his views in a brilliant essay),[1] continues today and is still hotly debated

The Food and Agriculture Organisation (F.A O) of the United Nations attempts regularly to collect data necessary to assess the complex relations between contemporary population changes and agricultural production CHATFIELD, SCOTT, and MAYER,[2] three members of the Nutrition Division of F A O, have set out the changes in each over the last decade, drawing their data largely from an official United Nations survey[3] It was estimated that between 1938 and 1948 the world population had gone up from 2174 to 2354 million—an increase of 8 3% For agricultural statistics, most of Africa and the U S S R do not provide data suitable for analysis In the remainder of the world the population, now 1777 million, has increased by 8 4%, but the figures for agricultural production, when translated into nutrients, show a corresponding increase in available calories of only 0 7% and in proteins of but 1 4% The aggregate daily supply of available calories has fallen from 2390 per caput before the war to 2220 in 1948 The difficulties in collecting international statistics are so great that individual figures must be taken with caution, but beyond reasonable doubt there has been a fall off in the average amount of food available per head throughout the world.

In the United Kingdom the available calories have changed little, from 3000 in 1938 to 2980 in 1948 Within our country the main alteration has been in the distribution of food It is certain that the economically unfavoured are eating more and the wealthy less today than in 1938 This levelling is a factor which leads to social stability and prevents unrest Unfortunately in the international field there is no sign of a corresponding levelling At the top, the U S A, Canada, and one or two other countries, well supplied in 1938, have more calories available per head for home consumption now At the bottom, more and more peoples have sunk to the level of semi starvation Whereas formerly 22% of the total world population lived at or below the level of 2000 calories, this proportion has now risen to 35% The increase in the inequality of distribution is the most disturbing feature of the world food picture and presents a fundamental problem in international politics, for all experience shows that in any country whose population is subsisting at the 2000 calorie level or lower political unrest is certain and civil war and disturbance an ever present threat

CHATFIELD, SCOTT, and MAYER refuse to take sides either with the optimists or with the prophets of doom They point out that the last decade was an abnormal one, and rightly state that it cannot be taken as a certain index of future trends Fortunately for our temporary peace of mind, most of us are optimists and refuse to believe that periods of war are "normal"

9 DePalma A F J Bone Jt Surg 1950 32B 653
10 Taylor R G Ibid 1950 32B 161
11 Judet, J Judet, R Ibid p 166

1 Malthus T R An Essay on the Principles of Population as it affects the Future Improvement of Society with Remarks on the Speculations of Mr Godwin M Condorcet and other Writers 1798
2 Chatfield C Scott, M. L Mayer J Milbank mem. Fd Quart 1950 28 103
3 The State of Food and Agriculture a Survey of World Conditions and Prospects Washington 1949 Pp 138 Obtainable from H.M. Stationery Office. 10s 6d

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the professional workers as much as possible of non-professional and non-technical duties; to provide, then, the facilities and machinery by which the fullest expression of functions may most easily be obtained."

4. *The administrative authority was normally vested in the governing body, which would meet perhaps quarterly, and between meetings a very large measure of that authority would be delegated to a smaller body and to certain officers*

The fact that these officers—usually the chairman (or treasurer) and the "clerk" or latterly the house-governor—were entrusted with considerable power to act in the name of the governing body greatly facilitated the smooth running of the institution.

The part played by the committee is largely traditional, and scarcely admits of precise definition A good description is that contained in an American textbook in 1913

" . The best conducted institution of whatever kind will be that in which the members of a board of directors are large and broad men and women, or both, who will insist upon the selection of the right sort of executives a board that can and will encourage all of its officers to do their utmost for the common good that will encourage all the facts in the institution to work in harmony with a common helpfulness. . The crying need is for men and women who will take a personal interest This does not mean that a board of directors should divide itself up into committees to look after the janitors and housework, or to run the training school, or to tell the members of the medical staff how to treat their patients, too many boards of directors contain just such members members who have plenty of time on their hands, but very little else to give to the institution, who have little influence in the community who have less judgment, and who eventually earn the wholesome contempt of those who have to do the real work in the institution—that is, the salaried employees. "

5. *A most important modification of the tradition was effected by Florence Nightingale when she got it established that hospitals were in fact better run if the matron were admitted as a third party to the partnership between lay authority and medical staff, and if the nursing of the patients and the domestic arrangements most closely connected therewith were entrusted to her care*

Having appointed a matron, the lay administration may no more give direction affecting matters entrusted to her care than they may interfere in the medical treatment of a patient by a member of the medical staff Other departments have since grown up and matrons have been relieved of some of the responsibility—notably catering—which they inherited from the Nightingale era but these changes scarcely affect the central issue. The newer departments can be grouped under one or other of the three heads

Current British practice offers examples of all degrees of responsibility ranging from something very like the pre-Nightingale, where the matron is subordinate to the medical officers, to the full Nightingale conception wherein the matron is "mistress of the household", and back again to a more recent phase in which the matron has discarded some of her less strictly nursing responsibilities At the same time her responsibilities in other directions—particularly recruitment—have become much heavier

Lay committees are apt to assume that because the matron is appointed by them it is proper for them to expect her to be answerable to them on all sorts of matters. This is certainly contrary to the central tradition once having appointed the matron the governing body leaves it to her to exercise her judgment in much the same sense as they leave the medical care of the patients to the medical staff.

6. *Since Florence Nightingale's time the hospital in the central tradition has been essentially a tripartite organisation—administration (with which financial control is inextricably bound up) acting in concert with the medical staff and with the matron and nursing staff Harmony depends on a recognition by all parties of the extent and limits of their respective responsibilities*

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A clear understanding of functions will often enable a comparative novice to see what is wrong when a hospital is in trouble Sometimes it is that the medical staff have allowed themselves to become confused as to their advisory status in regard to the management, or about the right way of making their influence felt, sometimes it is that the governing body do not appreciate the underlying contract into which they enter when they appoint a matron

A proper appreciation of the tensions and strains involved will help the administrator to know what to expect It is obvious that it is not to be expected that the day will pass without someone being upset about something when human frailty is superadded to an already complicated pattern of relationship Very much depends therefore on the way in which this stress is absorbed by the administration

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The pattern has been adopted, often very successfully, for certain special types of institution—mental hospitals, sanatoria for tuberculosis, and so on. By reason of the circumstances of its origin it has many affinities in Continental hospital systems maintained at the public expense A similar system has also been developed in America in the publicly provided hospitals

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Now mental pictures of this kind may be fairly accurate as far as they go, but they are wholly inadequate as a basis for discussions, the object of which is to settle the pattern of hospital administration for the next generation They fail to make clear what is the function of the administrative authority, and what is its relationship with the professional medical and nursing staff and how the main components fit together It was a partial failure of this kind which led to lapses in the Ministry's early hospital management committee circulars which have caused anxiety and difficulty, and if it is repeated again in the discussions now being undertaken the danger will be equally serious

It is necessary to get a clear grasp of the *principles* of hospital administration, and to understand the relationship of the governing body and the medical and nursing staff This relationship is traditional, it is nowhere defined in the Act or elsewhere, and a faulty appreciation of what is involved is by far the commonest source of friction in hospital affairs It is therefore most important to get a clear grasp of the central pattern and the variants upon it The subject has never been adequately handled, apart from the hints contained in Florence Nightingale's brief but famous appendix to her *Notes on Hospitals*

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The medical committee is (in words borrowed from a speech by Lord Moran in the House of Lords) as a general rule composed of all the senior staff In a large hospital, some thirty, forty, or fifty men may sit on this committee It is their duty to keep their colleagues informed of any new equipment or development of knowledge wherever it may occur all over the world, and some of them sit on the management committee and try to convince the committee that this or that should be done The arrangement serves a double purpose It is a guarantee that new projects (and they are legion) before reaching the governing body have first run the gauntlet of criticism and discussion in the medical committee and it sets the governing body itself free from the futility of spending its time listening to endless debates among the medical men Even in the older hospitals where the tradition is clearest, there were many different ways of achieving the general result above described For example, in some hospitals no members of the medical staff sat upon the governing body and consultation was achieved by means of a small joint subcommittee In others, too many of the medical staff were given seats on the governing body, and the balance was thereby upset

3 *The main function of the administration has been the enlightened pursuit of economy, "so far as it is consistent with the requirements of the sick"*

It is not too much to say that in hospital terminology that is what is meant by administration "Administration," wrote Florence Nightingale, "is intended to *enforce* economy as far as it is consistent with the requirements of the sick", elsewhere she speaks of the function of the administration as the "general discipline and control of expenditure" It is true that the words have a negative, discouraging ring and that since her day the range of interests required of a hospital administrator have been widened out of all recognition They are, nevertheless, a corrective to the now popular idea that the administrator can relegate the pursuit of economy to the finance officer and concern himself with the rest of the work

If administration is the pursuit of economy, what does economy mean ? The word has a wide range of meaning and is the source of much confusion in the hospital world In its true original sense it means the best working of the hospital within the limits of its resources—"value for money", in its other, and perhaps more common usage, it is twin sister to "cheese paring" The outsider who is little instructed in hospital affairs is very ready to invoke the need for economy, and to believe that the efficiency of the hospital can best be tested by little matters—the care taken about the pig-swill is a favourite example It is, of course, important to be careful about the pig swill, but it is more important to realise that economy goes much deeper than this and affects the whole range of hospital administration "The chief function of administration," wrote Dean Rappleye in a report to the Rockefeller Foundation in 1922, "is to create an environment conducive to the spontaneous, creative expressions of the groups working within the organisation and to relieve

the professional workers as much as possible of non-professional and non-technical duties, to provide, then, the facilities and machinery by which the fullest expression of functions may most easily be obtained"

4 *The administrative authority was normally vested in the governing body, which would meet perhaps quarterly, and between meetings a very large measure of that authority would be delegated to a smaller body and to certain officers*

The fact that these officers—usually the chairman (or treasurer) and the "clerk" or latterly the house governor—were entrusted with considerable power to act in the name of the governing body greatly facilitated the smooth running of the institution

The part played by the committee is largely traditional, and scarcely admits of precise definition A good description is that contained in an American textbook in 1913

"The best conducted institution of whatever kind will be that in which the members of a board of directors are large and broad men and women, or both, who will insist upon the selection of the right sort of executives a board that can and will encourage all of its officers to do their utmost for the common good that will encourage all the facts in the institution to work in harmony with a common helpfulness The crying need is for men and women who will take a personal interest This does not mean that a board of directors should divide itself up into committees to look after the janitors and housework, or to run the training school, or to tell the members of the medical staff how to treat their patients, too many boards of directors contain just such members members who have plenty of time on their hands but very little else to give to the institution who have little influence in the community, who have less judgment, and who eventually earn the wholesome contempt of those who have to do the real work in the institution—that is, the salaried employees"

5 *A most important modification of the tradition was effected by Florence Nightingale when she got it established that hospitals were in fact better run if the matron were admitted as a third party to the partnership between lay authority and medical staff, and if the nursing of the patients and the domestic arrangements most closely connected therewith were entrusted to her care*

Having appointed a matron, the lay administration may no more give direction affecting matters entrusted to her care than they may interfere in the medical treatment of a patient by a member of the medical staff Other departments have since grown up and matrons have been relieved of some of the responsibility—notably catering—which they inherited from the Nightingale era but these changes scarcely affect the central issue The newer departments can be grouped under one or other of the three heads

Current British practice offers examples of all degrees of responsibility, ranging from something very like the pre Nightingale, where the matron is subordinate to the medical officers, to the full Nightingale conception wherein the matron is "mistress of the household", and back again to a more recent phase, in which the matron has discarded some of her less strictly nursing responsibilities At the same time her responsibilities in other directions—particularly recruitment—have become much heavier

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In England Now

A Running Commentary by Peripatetic Correspondents

My shaggy blue roan cocker bitch (who is not so damn' shaggy as all that) did not display her usual enthusiasm when invited to come and walk partridges with me on Saturday "Of course, I'd *love* to come," she cooed in her mincing Cambridge accent, "but *actually* I've got the most *fearful* rheumatism in my off hind"—and she limped around on three legs wagging the rest of herself, a well known technique employed to excite sympathy I examined the limb but was unable to elicit any abnormal physical signs "You'd better come," I suggested, "you ll enjoy the ride and you needn't hunt if you don't want to" Protesting genteelly she allowed herself to be lumped into the car Arrived at the farm where we shoot, I helped her out and started to walk across a rough field Looking like a martyr, she limped dutifully behind Presently we put up a rabbit "Look, look, look!" she screamed and gave chase, as she always does, despite all my rating and whistling As usual the rabbit made the hedge safely with a dozen yards to spare and she came bounding back "What about that rheumatism?" I asked She made no reply but proceeded to quarter the field on four legs as thoroughly as ever We've heard no more about it Functional, you see

* * *

The Peripatetic Pathologist from Portsmouth, who ministered to the needs of the lady in the train soon after it left Grand Central Station, had a much easier time than I did on my way to Rome just after the war The Paris–Milan–Rome express was not yet restored to its pre-war comfort and "Mussolinian efficiency" and I had spent the last few hours wondering how late we would arrive in Rome—would we be 16 or 20 hours behind schedule?

My companion, who believed in comfort at all times, was in a foul temper, and trying hard to get some much needed beauty-sleep, when the guard came down the corridor, asking if there was a doctor on the train Once before, in my early enthusiastic days, I had got into an unfortunate position by bounding forward when such a cry was raised, so I cringed back in the darkest corner of the compartment When the guard had gone by, my companion rounded on me and scornfully demanded why I didn't help I was trying to explain when the guard returned up the crowded corridor asking for help in a more insistent tone. Somehow the other six of my fellow travellers had realised I was an English doctor, and now one of them dashed out, gesticulating furiously, and brought the guard to me I was feeling extremely un-English and un-medical My tweed jacket and corduroy trousers were not the most professional of garments, and I had just cut myself a large piece of Bologna sausage with my massive penknife Driven more by the contemptuous glances of my companion than any love for my fellow men, I allowed myself to be led away, leaving my companion telling the others that I was not a fair sample of the English medical profession, who, as a whole, were a fine upstanding body of well dressed men and only too ready to help

As I passed down the train, people standing in the corridor patted me on the back and hoped I would find the patient not too bad Arriving at the scene of the turmoil I found a young Italian woman stretched out on the seat, covered with coats and blankets, shivering violently She had a baby of six months with her and a little girl who was staring out of the window The baby was being looked after by an admirable body from Manchester, whose husband was doing his best to keep the compartment in order and prevent innumerable curious Italian males from coming in to look at the attractive victim The guard announced that he had brought a doctor, the woman moaned, opened her eyes to look at me, and gave a tremendous howl It was then that I realised I was bending over her with my penknife still open

My questioning of the patient was not at all successful, so the lady from Manchester told me that the woman had joined the train at the Italo Swiss frontier some 15 hours earlier and had been vomiting or retching for the past 12 I immediately thought of some abdominal crisis and tried to examine the appropriate part, but this led to more howls and protestations, in which the baby joined I realised we were getting nowhere fast, so I sat down and attended to the baby, on the principle that it's easier to think in peace than in a noise The Englishman produced his hip flask and I still had some barbiturate from the previous night, so I made a brew and gave the baby a few sips of it when the train conveniently stopped before crossing a newly repaired bridge The concoction worked admirably I then went all the way back for my companion—past all the back-slapping well-wishers who were now keen to know the diagnosis—and persuaded her to act as interpreter This proved unexpectedly difficult because the woman spoke a peculiar dialect and was having a violent rigor I decided it was imperative to palpate her abdomen, and eventually managed to get my left hand somewhere under her left costal margin N A D Further questions Had she had any food today? No Had she ever had a similar attack? Yes, the only time she had been on a train journey before Train-sickness, that was it I gave her the remainder of the baby's mixture Soon she was fast asleep, and the train obligingly moved forward

The daughter, aged about 7, now took an interest in the proceedings, and asked in very matter-of-fact tones, "Will she wake up in time to get out at Rome?" The question seemed to indicate a practical mind, so we began to question her Her name was Maria and they were going to Rome to stay with her uncle, whom she had met once and was sure she would recognise again At last we reached Rome, where my companion and Maria went off to look for Uncle, and also for my companion's friend whom she had not seen for some years Neither was there We stayed on the train until the cleaners turned us out, and then a rather bedraggled group set off to find accommodation for the night

Just as we left the station, the friend arrived His face, when he saw my companion holding a baby, accompanied by a rough-looking stranger leading a small girl and supporting a semicomatose Italian, made up for everything

* * *

Just before I left America, I optimistically sent off one of those postcards that one gets saying "Dear Dr Pedantic, I should appreciate a copy of your article, *Melons as a cure for gout*, which appeared in *J contemp Idiocrac* for June, p 12345" Optimistically because it was to China, and those of us who have never been further East than Marseilles often look on China as backward in modern things, though of course we know all about the Chinese having aeroplanes (or was it wireless?) in 2000 B C So judge my surprise when I received an envelope covered with the most fascinating ideographs and containing not a reprint but a microfilm strip of the article Now I am looking for a "reader" Perhaps if someone in China sees this ?

* * *

I see that the virus of poliomyelitis (Brunhilde strain) is described as "slightly spherical" Is this the new geometry or a misplaced comment on a Wagnerian soprano?

* * *

It will be universally agreed,
I think, that goats
Aren't difficult to feed
They do not need
The choicer fruits,
Nor roots,
Nor oats,
Nor succulent veg
Indeed,
The parings from the hedge
Slip down their throats
With ease and speed
Uncomplaining and unbleating,
They ask no better eating
—Except, perhaps, the minutes of the
last meeting

kinds were thrown together into a single system by the National Health Service Act for reasons almost wholly unconnected with the principles of their internal management The old dual system of hospitals was abandoned because of the lack of planning of the service as a whole, poor distribution of consultants, and so on Nobody ever argued that it would be a good thing to pool the two principles of administration and hope for the best, but that is what happened when the Act provided for setting up hospital management committees without prior consideration of how they were to be expected to exercise the functions we have been discussing Since the Act was passed the tendency of the Ministry of Health has been, on the whole, towards the central or voluntary pattern described above, stressing in particular consultant staffing with lay administration, though the principles lying behind these arrangements have often not been understood

The departures from the older central pattern discernible in the present conception of the "hospital management committee" are indeed worth drawing out in order

1 The distinction between the administrative responsibility of the committee and the advisory status of the medical staff has been blurred by the appointment of members of the medical staff of the hospitals concerned to the hospital management committee otherwise than on the nomination of the medical committee

2 The medical staff of the hospital management committee, though they are its own "better half," owe less than complete allegiance to it, since they are appointed and paid by the regional hospital board Moreover, the medical staff has become too numerous to act as a medical staff committee in direct relationship with the hospital management committee, and a small medical advisory committee has been called into being to discharge this function

3 The primary administrative function—the enlightened pursuit of economy—has been blunted in three ways First, by the failure to give the committee full financial responsibility within its total allocation Though it prepares its own estimates and thereby possesses a great power to influence the direction of expenditure, it is denied the power to "save" for its own purposes Secondly, the chief administrative officer, though automatically responsible for economy by reason of the nature of hospital administration, is required to share his responsibility with his finance officer, whose very title is an importation from the other tradition where finance is regarded as a separate function Thirdly, a new doctrine has been loosely imported, probably from industry, that it is the function of members of the hospital management committee to represent—even to protect—the consumer Sometimes indeed they seem to be appointed to protect the interests of particular categories of hospital worker This is very far from the true tradition, which regards their function as the wise spending of the limited resources at their disposal in accordance with the guidance of the medical and nursing staff

4 The old pattern whereby the administrative authority of the hospital was vested in a relatively small and compact house committee and in the chairman and chief administrative officer, finds only a feeble counterpart in a hospital management committee Responsibility tends to be regarded as vesting solely in the committee, which itself meets monthly, and the principal officers—the chairman and the secretary—are often reluctant to claim authority to act Their authority to take action is rarely specified in standing orders

5 The full professional responsibility entrusted to the matron by the Florence Nightingale tradition is inevitably distributed among the various matrons in the different hospitals, whether or not arrangements are made for a "group matron" with some supervisory responsibility. This may be no disadvantage, having regard to the growth in size of the nursing responsibilities, but again it tends to disrupt the old tripartite arrangement Often no matron is present at the meetings of the hospital management committee

Some Principles

From such a background as this, is it possible to draw out any principles for guidance in the future, or must we settle down simply to make the best of the muddle that results?

Well, let us try, partly by way of eludication and partly recapitulation

The *first principle* is that the administration not only entrusts the medical care of the patients to the medical staff, but also looks to the medical staff for advice in regard to the management of the hospital And from this there follows the corollary that in matters that affect the administration of the hospital, as distinct from the medical care of the individual patients admitted to their care, the medical staff must invariably act through the medical committee (or "medical advisory committee") and refrain from exerting pressure on the administration save through the recognised channel

(We may remark in parentheses that these objectives are best furthered if medical men sit on the governing body as chosen representatives of the medical committee, and not otherwise)

The *second principle* is that the administration entrusts the nursing care of the patients and the control of the nursing staff to the matron, and in dealing with questions that may affect the nursing of the patients, looks to its matron for advice The committee must recognise her professional responsibility for her arrangements—except indeed in so far as she may be acting, as she often does for convenience, as an administrative officer of the hospital

(We may remark in parentheses that if a "nursing committee" is set up alongside the matron its scope and functions need to be clearly defined, for there are certain matters which cannot be thus delegated without destroying the matron's proper professional responsibility It should probably be regarded as advisory to the matron, not as a subcommittee of the board carrying executive powers If it is argued that the calibre of those seeking the position is too often unequal to the responsibility, it may fairly be asked if women of ability will be attracted to matrons' posts unless they offer ample scope of a true professional kind)

The *third principle* is that the administrative authority, being concerned with the enlightened pursuit of economy, endeavours so to dispose of the resources of the hospital as best to meet the needs of the patients and with due regard to the advice of the medical and nursing staff And from this it follows as a corollary that the administrative authority should be composed of men and women of the right sort, chosen for their experience of affairs, including financial affairs, and proved ability to choose staff of the right kind, and not because they "represent" particular aspects of "consumer interest"

(Again we may remark in parentheses that if the local administration is deprived of the power to dispose of the resources of the institution as it deems best in accordance with the advice of its medical and nursing staff, it might as well be dissolved forthwith and the hospital handed over to the Assistance Publique de Paris)

> "If we were perfect, no doubt an absolute hierarchy would be the best kind of government for all institutions But in our imperfect state of conscience and enlightenment, publicity and the collision resulting from publicity, are the best guardians of the interests of the sick
>
> FLORENCE NIGHTINGALE, *Notes on Hospitals*

In England Now

A Running Commentary by Peripatetic Correspondents

My shaggy blue roan cocker bitch (who is not so damn' shaggy as all that) did not display her usual enthusiasm when invited to come and walk partridges with me on Saturday "Of course, I'd *love* to come," she cooed in her mincing Cambridge accent, "but *actually* I've got the most *fearful* rheumatism in my off hind"—and she limped around on three legs wagging the rest of herself, a well known technique employed to excite sympathy I examined the limb but was unable to elicit any abnormal physical signs "You'd better come," I suggested 'you ll enjoy the ride and you needn't hunt if you don't want to" Protesting genteelly she allowed herself to be lumped into the car Arrived at the farm where we shoot, I helped her out and started to walk across a rough field Looking like a martyr, she limped dutifully behind Presently we put up a rabbit 'Look, look look!" she screamed and gave chase, as she always does, despite all my rating and whistling As usual the rabbit made the hedge safely with a dozen yards to spare and she came bounding back. "What about that rheumatism?" I asked She made no reply but proceeded to quarter the field on four legs as thoroughly as ever We've heard no more about it Functional, you see

* * *

The Peripatetic Pathologist from Portsmouth, who ministered to the needs of the lady in the train soon after it left Grand Central Station, had a much easier time than I did on my way to Rome just after the war The Paris–Milan–Rome express was not yet restored to its pre-war comfort and 'Mussolinian efficiency" and I had spent the last few hours wondering how late we would arrive in Rome—would we be 16 or 20 hours behind schedule?

My companion, who believed in comfort at all times, was in a foul temper, and trying hard to get some much needed beauty-sleep when the guard came down the corridor, asking if there was a doctor on the train Once before, in my early enthusiastic days, I had got into an unfortunate position by bounding forward when such a cry was raised, so I cringed back in the darkest corner of the compartment When the guard had gone by, my companion rounded on me and scornfully demanded why I didn't help I was trying to explain when the guard returned up the crowded corridor asking for help in a more insistent tone Somehow the other six of my fellow travellers had realised I was an English doctor, and now one of them dashed out, gesticulating furiously, and brought the guard to me I was feeling extremely un-English and un-medical. My tweed jacket and corduroy trousers were not the most professional of garments, and I had just cut myself a large piece of Bologna sausage with my massive penknife. Driven more by the contemptuous glances of my companion than any love for my fellow men, I allowed myself to be led away, leaving my companion telling the others that I was not a fair sample of the English medical profession, who, as a whole, were a fine upstanding body of well-dressed men and only too ready to help

As I passed down the train, people standing in the corridor patted me on the back and hoped I would find the patient not too bad. Arriving at the scene of the turmoil I found a young Italian woman stretched out on the seat, covered with coats and blankets, shivering violently She had a baby of six months with her and a little girl who was staring out of the window The baby was being looked after by an admirable body from Manchester, whose husband was doing his best to keep the compartment in order and prevent innumerable curious Italian males from coming in to look at the attractive victim. The guard announced that he had brought a doctor, the woman moaned opened her eyes to look at me, and gave a tremendous howl. It was then that I realised I was bending over her with my penknife still open

My questioning of the patient was not at all successful, so the lady from Manchester told me that the woman had joined the train at the Italo Swiss frontier some 15 hours earlier and had been vomiting or retching for the past 12 I immediately thought of some abdominal crisis and tried to examine the appropriate part, but this led to more howls and protestations, in which the baby joined I realised we were getting nowhere fast, so I sat down and attended to the baby, on the principle that it's easier to think in peace than in a noise The Englishman produced his hip flask and I still had some barbiturate from the previous night, so I made a brew and gave the baby a few sips of it when the train conveniently stopped before crossing a newly repaired bridge The concoction worked admirably I then went all the way back for my companion—past all the back-slapping well-wishers who were now keen to know the diagnosis—and persuaded her to act as interpreter This proved unexpectedly difficult because the woman spoke a peculiar dialect and was having a violent rigor I decided it was imperative to palpate her abdomen, and eventually managed to get my left hand somewhere under her left costal margin N.A D Further questions Had she had any food today? No Had she ever had a similar attack? Yes, the only time she had been on a train journey before Train-sickness that was it I gave her the remainder of the baby's mixture Soon she was fast asleep, and the train obligingly moved forward

The daughter, aged about 7, now took an interest in the proceedings, and asked in very matter-of-fact tones, 'Will she wake up in time to get out at Rome?" The question seemed to indicate a practical mind, so we began to question her Her name was Maria and they were going to Rome to stay with her uncle, whom she had met once and was sure she would recognise again At last we reached Rome, where my companion and Maria went off to look for Uncle, and also for my companion's friend whom she had not seen for some years Neither was there We stayed on the train until the cleaners turned us out, and then a rather bedraggled group set off to find accommodation for the night

Just as we left the station, the friend arrived His face, when he saw my companion holding a baby accompanied by a rough-looking stranger leading a small girl and supporting a semicomatose Italian, made up for everything

* * *

Just before I left America, I optimistically sent off one of those postcards that one gets saying "Dear Dr Pedantic, I should appreciate a copy of your article, *Melons as a cure for gout*, which appeared in *J contemp Idiocrac* for June, p 12345" Optimistically because it was to China, and those of us who have never been further East than Marseilles often look on China as backward in modern things, though of course we know all about the Chinese having aeroplanes (or was it wireless?) in 2000 B C So judge my surprise when I received an envelope covered with the most fascinating ideographs and containing not a reprint but a microfilm strip of the article Now I am looking for a "reader" Perhaps if someone in China sees this ?

* * *

I see that the virus of poliomyelitis (Brunhilde strain) is described as "slightly spherical" Is this the new geometry or a misplaced comment on a Wagnerian soprano?

* * *

It will be universally agreed,
I think, that goats
Aren t difficult to feed
They do not need
The choicer fruits,
Nor roots,
Nor oats
Nor succulent veg
Indeed,
The parings from the hedge
Slip down their throats
With ease and speed
Uncomplaining and unbleating,
They ask no better eating
—Except, perhaps, the minutes of the
last meeting

Letters to the Editor

DISEASES OF THE CENTRAL ADAPTATION SYNDROME IN AFRICANS

SIR,—I have only lately been able to read the Heberden oration delivered by Professor Selye on June 2[1] Previously I had paid but little attention to his work because he appeared to be working with diseases uncommon among Africans in this part of the continent

The almost complete absence of some diseases, such as disseminated sclerosis, in most of Africa, including South Africa, may reflect the absence of an infection, or the presence or absence of some trace element in the local soils and foodstuffs But neither the absence of an infection, nor climatic factors, by themselves, will explain the fact that a great number of diseases common in Europeans and Asians are quite uncommon among the local inhabitants, although apparently present in almost their normal distribution among the descendants of the negro race in the warmer parts of the U S.A. and Central America Doubtless a genetic factor can be invoked in certain conditions, this may operate in the very low incidence of pernicious anæmia, of which I have seen only quite recently my first typical case in an African

It would be wrong to suggest that diseases of stress do not occur among Africans in Uganda, but it is almost certainly true that many of these diseases are far less common among them than among Asians and Europeans living under similar climatic environment but having a different genetic background, a different incidence of tropical and other infections, and a different diet The following diseases are far less common in Africans rheumatoid arthritis, psoriasis, essential hypertension, coronary artery disease, hypertensive cerebral hæmorrhage, thyrotoxicosis, and peptic ulcer The following diseases are probably less common, though it is difficult to collect accurate data atopic dermatitis and eczema, gout, hay-fever, and Hodgkin's disease Upon many of the so called diseases of stress it is difficult to offer any definite opinion Rheumatic fever is uncommon, on the other hand, some would say that streptococcal sore throat is not so common in these parts, and true acute hæmorrhagic nephritis (Ellis type-I) is very rare Keloids, and hepatitis and cirrhosis of the liver—diseases which may, it is suggested, respond to adrenocorticotropic hormone or 'Cortisone'—are extremely common

Professor Selye seems to have grouped together under his title of "diseases of the general adaptation syndrome" the large majority, but not all, of the diseases which are uncommon among Africans *This is more than a coincidence it is a fact of overwhelming importance* Probably, however, none of these diseases is totally absent, and my clinical impression is that they are commoner among upper class Africans, who are better fed and less exposed to certain infections At present the African appears able to prevent these diseases to an extent which those who regard themselves as advanced can only envy

May I, in conclusion, express my personal debt to Prof Joseph Gillman, who introduced me to the relation between chronic malnutrition and the endocrine glands, the latter being often abnormal in Africans

Thanks are due to the Director of Medical Services Uganda, for permission to publish this communication

Department of Medicine
Mulago Hospital and Makerere College University College of East Africa.

H C TROWELL
Specialist Physician
Uganda Medical Service

1 Selye, H *Brit med J* 1950 i, 1383

POSTURE

SIR,—Dr Lise Gellner (July 15) and Dr Mungo Douglas (July 29) raise important points in connection with the "primary control" described by F M Alexander and mentioned in my article on his work (July 1)

I think there is no reason now to doubt the prevalence of "head retraction" under civilised conditions, and undoubtedly this defect has an important influence on the "manner of use" of the rest of the body There are at least three schools of thought on this question of what constitutes the primary defect in conditions of faulty body mechanics One school blames the pelvis, another the head, and a third the foot, and accordingly one of these three is singled out as the primary subject for re education

Most orthopædic and physical medicine authorities follow Wiles in stressing the importance of the pelvis[1] Mr Alexander, Prof Raymond Dart, and a few others stress the importance of the head neck relationship Both on theoretical and practical grounds, I am convinced that this last view is the right one The head, after all, carries the balancing apparatus—the labyrinth—and in addition it carries the eyes, which have an important reflex influence on posture. Added to this, there are the attitudinal reflexes of Magnus, which are evoked from the cervical musculature The pelvis carries no organs which have any particular relevance to the reflex control of posture

Dr Gellner asks *why* the head should so often be retracted, and blames the heel on the infant's shoe for this defect, in fact, she makes the foot "primary" to the head My own view is that the number of such harmful influences which may encourage head retraction, must be legion I have in front of me a beautiful series of photographs which illustrate the harmful effect of encouraging infants to sit up too soon, before there has been adequate neuromuscular maturation Likewise, one can blame faulty maternal handling, faulty school furniture, faulty shoes, unenlightened physical exercise programmes which encourage too rapid and too tense muscular responses—and so on

In dealing with this question of what is the "primary" cause of faulty body mechanics, it is helpful to consult philosophers, and to find out exactly what is meant by "causation" and "explanation" Gilbert Ryle,[2] in a book which ought to be compulsory reading for writers on medical subjects, points out that there are at least two quite different senses in which an occurrence is said to be explained There are accordingly at least two quite different senses in which we ask "why" it occurred and two quite different senses in which we say that it happened "because" so and so was the case The first sense is the causal sense Consider the simple example of a stone striking a piece of glass and breaking it To ask why the glass broke is to ask what caused it to break, and we explain, in this sense, the breaking of the glass when we report that a stone hit it But very frequently we look for and get explanations of occurrences in another sense of "explanation" *We ask why the glass broke,* and we get the answer that it was because the glass was brittle "Brittle" is a dispositional adjective, that is to say, to describe the glass as brittle is to assert a general hypothetical proposition about the glass

In answering this question of "why" the head is retracted, I prefer to stick to a "dispositional" account, rather than to look for extraneous "stones" like the heel on the infant's shoe An anatomical account is a satisfactory approach, and the following account is taken from Professor Dart[3]

1 Wiles P Essentials of Orthopædics London 1949
2 Ryle G The Concept of Mind. London, 1949
3 Dart, Raymond. *S Afr med J* 1947 21 7[illegible]

The muscles which look after the relationship of the head with the vertebral column in man (and other primates) have cranial insertions mainly confined to the occipital bone but there is a great disparity in number, strength, and size between the anterior (or flexor) group of muscles and the posterior (or extensor) group The force of gravity compensates for the relatively few weak and small flexors in pronograde animals, but in a creature such as man this disparity between strong head extensors and weak head flexors is accentuated by the orthograde posture

The spinal accessory nerve supply of the trapezius further complicates this business of "head retraction," because of the entirely reflex or automatic functions in which it participates The spinal half of the accessory nucleus is intimately concerned with all movements and postural adjustments of the head via the trapezius and sternomastoid, meanwhile the cranial portion of the nerve is inextricably associated with all of the movements of the pharynx in swallowing and of the larynx in respiration and vocalisation Arising coterminously from the same four medulla oblongata neuromeres as give origin to the glossopharyngeal, vagus, and accessory nerves, the hypoglossal nucleus controls the movements of the tongue in mastication and swallowing To carry out these almost automatic or reflex functions at the same time as the body is being held erect is a complex task, calling for a high degree of coördination, and for an adequate kinæsthetic appreciation of the head neck relationship The kinæsthetic appreciation of this region is almost always defective [4] but the defect can be put right by suitable re-education, with a resultant improvement in the management of the rest of the body

In his achievement of the erect posture, man has had to over-emphasise the extensor mechanism at the expense of the flexor "Conditions of civilisation"—I doubt if one can be more specific than this—make more difficult the maintenance of what is already a complex anatomical arrangement in the head neck region From a practical point of view, the focusing of re-educational work on the head neck relationship as a "primary control" is most effective I personally am convinced by practical experience that this "primary control" is a reality, and that its presence cannot be ignored when we are carrying out re-educational work

London, S W 7 WILFRED BARLOW

MENINGITIS LEPTOSPIROSA

SIR,—The report of a further case of meningitis leptospirosa by Dr Geffen and Dr Tinker (Aug 5) is to be welcomed during the present epidemic season of poliomyelitis A similar case has recently been seen at this hospital. Alston and Broom [5] at this time last year drew attention to the difficulty of differentiating between leptospirosis and non paralytic poliomyelitis

On Aug 12, 1950, a boy, aged 7 years, was transferred to the tuberculous meningitis unit of this hospital from an isolation hospital in an area where poliomyelitis has recently occurred He had a history of headache, vomiting, abdominal pain, and fever for three days On admission to the isolation hospital (under the care of Dr A. D C S Cameron) on Aug 9, he had neck stiffness but no other abnormal signs in the nervous system. Examination of the cerebrospinal fluid (C S.F) showed 4 cells per c.mm., protein 40 mg per 100 ml chlorides 710 mg per 100 ml, and sugar normal Three days later the fluid contained 252 cells per c.mm (60% lymphocytes, 40% polymorphs), protein 40 mg per 100 ml, chlorides 710 mg per 100 ml., and sugar normal

On admission to this hospital he had a temperature of 100°F and neck stiffness. He was fully conscious No conjunctivitis, muscle tenderness, or paralysis was noted On Aug 13 the C S.F contained 200 cells per c.mm. (90% lymphocytes) protein 30 mg per 100 ml., chlorides 700 mg per 100 ml, and sugar 98 mg per 100 ml No tubercle bacilli were seen The Mantoux reaction was negative (1 in 1000) and radiological examination of the chest revealed no abnormality Two days later conjunctivitis was noticed in the morning but was absent in the afternoon.

On Aug 15 agglutinins were present in the serum against *Leptospira canicola* up to 1 in 300, and against *L icterohæmorrhagiæ* up to 1 in 300 with a trace at 1 in 1000 On Aug 22 the titre for *L canicola* had risen to 1 in 1000, and for *L icterohæmorrhagiæ* it was 1 in 300 (Archway group laboratory)

Conjunctivitis or suffusion of the eyes, which may be mild and transient, is an important clinical sign in leptospirosis The level of urea in the blood is usually raised,[6] and the C S F glucose level is within normal limits It is the practice in our tuberculous meningitis unit to carry out serological investigations for leptospirosis and infectious mononucleosis in all patients with lymphocytic non tuberculous meningitis in whom an alternative ætiology is not readily apparent

A diagnosis of infantile paralysis not unnaturally causes considerable anxiety at the present time, and it is therefore important to distinguish patients who have leptospirosis, because of the difference in prognosis

Whittington Hospital London, N 19 W L CALNAN

MEIGS'S SYNDROME

SIR,—In your issue of Aug 5, Dr Beresford and Dr Aidin point out that cases of Meigs's syndrome are often admitted to a medical ward with a diagnosis of congestive heart failure or of cirrhosis of the liver, both of which can be associated with ascites and hydrothorax. This is undoubtedly so It is possible that in some instances of cirrhosis of the liver (and perhaps of heart-failure, polyserositis, or multiple tuberculous effusions) the mechanism of production of hydrothorax associated with ascites is similar to that in Meigs's syndrome

The following fatal case of cirrhosis of the liver illustrates this possibility

A boy, aged 11 years, was admitted to the General Infirmary at Leeds on Sept 23 1949, with a history of malaise and cough starting three weeks previously Slight jaundice was noticed twelve days after the onset On admission there was gross ascites, œdema of the ankles smooth enlargement of the liver to the umbilicus, a palpable spleen, and a massive right hydrothorax with no evidence of effusion on the left side Serum proteins were 5 5 g per 100 ml, with albumin 2 2 g and globulin 3 3 g per 100 ml His condition remained little altered and fluid re accumulated in the right chest in spite of repeated aspiration, until Oct 10 when he developed severe right-sided abdominal pain and fever This became worse after abdominal paracentesis, and it was thought that peritonitis had developed There was little response to penicillin and sulphamezathine, and he gradually became confused and died in coma on Oct 19

Post-mortem examination (Dr D H. Collins) showed a coarse cirrhosis with postnecrotic scarring, and confirmed the presence of ascites and massive right hydrothorax. The left pleural sac showed no abnormality beyond interlobar adhesions The pericardium contained a small amount of clear fluid. The omentum and the surface of the peritoneal cavity was congested, and similar changes were seen in the right pleura particularly over the diaphragm. The left pleural surface and diaphragm were normal apart from several small petechial hæmorrhages Histological examination of the omentum showed dilatation of capillaries and veins which were engorged with blood and a light infiltration of lymphocytes with a much smaller number of neutrophils and eosinophils The right diaphragm showed similar changes on its peritoneal surface, but the inflammatory reaction was much more intense on the pleural surface and there were small pockets of pus cells

Though the serum proteins were much reduced, and this reduction might account for the ascites and œdema of the ankles, it is difficult to explain the massive right hydrothorax on this basis alone, particularly in the absence of any fluid in the left pleura It seems possible that its mechanism of production might be similar to that of the pleural effusion (commonly on the right) which occurs in Meigs's syndrome The distribution of the changes in the acute inflammatory episode affecting the peritoneum and the right diaphragm and pleura

4 Barlow W *Med. Pr* 1946 215 60
5 Alston, J M. Broom J C *Lancet* 1949 ii, 306
6 Robertson, K M *Ibid*, 1947, ii, 695

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It would be wrong to suggest that diseases of stress do not occur among Africans in Uganda, but it is almost certainly true that many of these diseases are far less common among them than among Asians and Europeans living under similar climatic environment but having a different genetic background, a different incidence of tropical and other infections, and a different diet The following diseases are far less common in Africans rheumatoid arthritis, psoriasis, essential hypertension, coronary-artery disease, hypertensive cerebral hæmorrhage, thyrotoxicosis, and peptic ulcer The following diseases are probably less common, though it is difficult to collect accurate data atopic dermatitis and eczema, gout, hay-fever, and Hodgkin's disease Upon many of the so-called diseases of stress it is difficult to offer any definite opinion Rheumatic fever is uncommon, on the other hand, some would say that streptococcal sore throat is not so common in these parts, and true acute hæmorrhagic nephritis (Ellis type-I) is very rare Keloids, and hepatitis and cirrhosis of the liver—diseases which may, it is suggested, respond to adrenocorticotropic hormone or 'Cortisone'—are extremely common

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Department of Medicine
Mulago Hospital and Makerere College University College of East Africa

H C TROWELL
Specialist Physician, Uganda Medical Service

1 Selye, H *Brit med J* 1950 1 1383

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2 Ryle G The Concept of Mind London 1949
3 Dart Raymond. *S Afr med J* 1947 21 74

sponding with date of onset, (2) typical allergic picture, (3) definite leucocytosis, (4) painlessly enlarged liver, (5) positive patch tests, and (6) the recent description of similar cases occurring during P.A.S therapy, it seems that this is a case of toxic hepatitis due to P.A S

EVELYN HESS
D G ISMAY

Tuberculosis Unit
West Middlesex Hospital,
Isleworth.

SIR,—The following case is essentially similar to those described by Dr Cuthbert and correspondents who have written since his letter appeared

The patient was a youth, aged 19, with fairly long standing productive tuberculosis in the left upper lobe The lesion was cavitated, and there was evidence of localised endobronchitis with slight recent deterioration. He had been afebrile for some months and was in good general condition.

On July 15 1950, streptomycin 1 g daily and P.A.S 15 g daily was begun. There was no diarrhœa vomiting or anorexia but on the 20th day of treatment the patient complained of lassitude and was found to have a temperature of 100 F The next day he became more ill and towards the evening complained of frontal headache, shivering, and a hot skin. The temperature rose to 103 5°F and the pulse rate to 120 per min., but there were no other physical signs On the 23rd day the temperature rose to 104 5°F, and simultaneously the patient developed a generalised papulo-erythematous rash, which began on the backs of the hands and spread from the extremities to the trunk and face The palms and soles escaped, and itching was confined to the latter He also complained of a severe sore throat with difficulty in swallowing the throat was very red and slightly œdematous The tongue was heavily coated. His face was flushed and looked puffy, and there was well marked injection of the conjunctivæ No enlarged glands were felt

The next day he appeared extremely ill, with malaise and prostration, in the evening the temperature again reached 104 5°F and the rash had become more noticeable Up to this time blood-counts had shown 8–12% monocytes but were otherwise normal throat swabs had shown no pathogens and three specimens of urine had shown no albumin, cells or casts No icterus developed

On the 25th day P.A.S and streptomycin were discontinued The temperature promptly fell to normal and the rash faded within 48 hours without subsequent desquamation Patch tests on Aug 12 with 20% P.A.S 20% sodium salicylate, and 20% streptomycin were all negative There were no further developments and the patient seemed quite well. The Paul Bunnell reaction was negative

On Aug 21, 0·5 g P.A.S was given. Within 3 hours the patient complained of generalised itching and shortly afterwards of sore throat, and the rash began to recur There was no fever headache or malaise The symptoms subsided within 9 hours

Desensitisation to P.A.S was begun on Aug 23 with a daily dose of 100 mg which has been gradually increased. This has so far been carried out uneventfully No anti histamine drugs have been used.

Twenty six other patients have been treated with similar doses of the same preparation of P.A.S, and other than diarrhœa and anorexia in three cases there have been no toxic reactions

Military Hospital Cowglen
Glasgow

R G GIBBS

PROPHYLACTIC INOCULATION AND POLIOMYELITIS

SIR,—The present anxiety in regard to a possible connection between inoculation against diphtheria and the occurrence of poliomyelitis raises many questions One of these concerns the method of inoculation.

Practically all authorities have advocated the intramuscular route. Many years ago, when we were working with the original A.P T preparations of the Wellcome laboratories, we encountered sterile abscesses from time to time These still occur, though in an insignificant proportion of cases It has always seemed to me that while the occurrence of such abscesses remained a possibility, it was better that they should be superficial than deep and, accordingly, we have invariably administered these antigens by the subcutaneous route

As I understand it, the present view appears to be that the injection of a foreign material into the substance of a muscle may have an irritant effect on nerve-endings and predispose them to the lodgement of poliomyelitis virus This is, of course, hypothesis only, but it may be worth investigating The main difficulty in this will, I think, be that in practically all cases previously inoculated the injection will have been made by the intramuscular route

We have been fortunate in escaping poliomyelitis in this area In the past three years only five cases have come to our notice, and in only one of these was there a history of immunisation. The child concerned had received a single injection of P T.A.P five months before the onset of the disease, and in his case the right leg was affected, the arms having completely escaped.

J C SAUNDERS
City Medical Officer

Cork.

PSEUDOMONAS AERUGINOSA

SIR —We wish to appeal for strains of *Pseudomonas aeruginosa* We have carried out, with some measure of success, work with a view to producing type specific bacteriophages capable of lysing *Ps aeruginosa* We have, however been able to deal only with strains obtained from the West of Scotland and we should like, if possible, to get strains from other parts of the country

Any cultures sent to Professor Todd at the address given below will be gratefully acknowledged, and, if desired, the results of our findings will be communicated to the centre concerned. Cultures should be accompanied by a note giving details of source and date of isolation

School of Pharmacy
Royal Technical College
George Street Glasgow C 1

JAMES P TODD
CHARLES S TERRY

SALICYLATES IN ACUTE OSTEOMYELITIS

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We have shown in animals and in man that the effect of large doses of salicylate differs essentially from the effect of smaller doses With large doses the body's non-specific defence mechanism is remarkably stimulated For this reaction adrenal activity is indispensable, both adrenaline and the cortical hormones seem to take part in it Sodium gentisate is less effective than sodium salicylate in evoking the reaction.

Our results shed new light on Coburn's [2] observations on the therapeutic significance of heavy doses of salicylate, and they again underline the importance of what has been termed the "alarm reaction" [3]—namely, the non-specific reaction mediated by the A.C T.H. glucocorticoid mechanism The therapeutic significance of these substances is well known [4]

In some of our animal experiments salicylate was more effective than 4 mg A.C T.H. or Cortisone per 100 g body-weight Perhaps salicylate causes the release from the adrenal cortex of a different hormone The beneficial effect of large doses of salicylate in several diseases—which so far has not been explained satisfactorily—may be also accounted for in this way

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Szeged University Hungary

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Leeds IAN MACPHERSON

A LARGE BENIGN GASTRIC ULCER

SIR,—Though large gastric ulcers are often seen in every general hospital, the case described here is notable for the absence of any clinical indication of the site or the size of the ulcer and for the associated arterial calcification, the significance of which was not realised

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On examination his abdomen was slightly distended and there was some visible peristalsis No mass was palpable, and there were no other significant findings After repeated washouts a barium enema gave a normal result, but considerable calcification in the abdominal aorta and other vessels was found A barium meal revealed a huge ulcer occupying almost the whole of the lesser curvature (see figure) The ulcer was so large that its true nature was only shown by a bubble of air which was retained at the apex when the patient was standing In the prone position it was more clearly outlined and the stomach was seen to be relatively immobile There was very little opposing spasm and no peristalsis, and the pyloric antrum was narrowed, also showing poor peristalsis Radiologically it was felt that the ulcer was probably malignant, and that the pylorus was probably also involved A fractional test-meal was completely normal, and gastroscopy showed that the ulcer had a smooth grey floor with a nodular margin The mucosa in the pyloric antrum appeared normal, but the ulcer as seen gastroscopically was thought to be malignant

Radiogram after barium meal with patient erect showing large ulcer (between arrows) on lesser curvature

Operation—The abdomen was opened through a right paramedian incision, and the ulcer was found to be adherent to the pancreas An almost total gastrectomy was performed, and a posterior anastomosis with a valve completed the operation

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The discovery of the ulcer was a complete surprise, for there was no indication in the history or clinical examination that the stomach was the cause of the pain, much of which must have been referred from the pancreas According to Elkeles,[1] a diagnosis of simple rather than malignant ulceration is supported by the well marked arterial calcification, although not all surgeons with experience of gastric surgery would subscribe to this view

However, as this case demonstrates, the presence of advanced calcification in the gastric vessels is clearly an indication for laparotomy—even though the size and history of the ulcer, and other findings, are in favour of malignancy nor does this calcification necessarily increase the risk of the operative removal of such an ulcer, provided the patient's general condition offers no contra indication

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SIR,—The jaundice during P.A.S treatment described by Dr Cuthbert on Aug 5 and by correspondents since then prompts us to report a further case

The patient is a married woman, aged 33, with acute exudative tuberculous infiltration of the right upper lobe On admission to hospital on July 19, 1950, she was pyrexial, and on July 24 a course of streptomycin (1 g daily) and P.A.S (3 g four times daily) was commenced The patient tolerated the drugs well and became apyrexial

On Aug 19 a fine erythematous eruption appeared on the legs Both drugs were immediately stopped, but the rash became generalised, intensely irritating, and maculopapular in character There was conjunctivitis and rhinitis, and the temperature rose to 100°F 'Thephorin' was now administered, but the temperature rose further to 103°F, and at this stage the patient felt very ill with nausea and anorexia The white cell count was 19,000 per c mm with 86% polymorphs, 13% lymphocytes, and no eosinophils

By Aug 25 the temperature had settled, and the rash had lessened and was beginning to desquamate On Sept 1, when only desquamation remained and thephorin had been discontinued, an icteric tinge was observed in conjunctivæ and skin, the patient continued to feel well By Sept 5 she was deeply jaundiced, the stools were clay coloured, and the urine was dark and contained bile pigments, the liver was easily palpable but not tender The patient had no gastric symptoms and still had a good appetite The white-cell count had fallen to 7000 per c mm (polymorphs 49%, lymphocytes 37%, and for the first time an eosinophilia of 11%) The blood urea was 26 mg per 100 ml, and all the empirical liver function tests were indicative of toxic hepatitis The jaundice has persisted and the liver remains enlarged

Before the onset of jaundice a series of patch tests were carried out with P.A.S, methaminophenol, streptomycin, and salicylic acid There was a positive reaction to P A S and methaminophenol

The diagnoses of acute infective hepatitis and homologous serum jaundice were considered, but in view of (1) absence of history of contact or venipuncture corre

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sponding with date of onset (2) typical allergic picture, (3) definite leucocytosis, (4) painlessly enlarged liver, (5) positive patch tests, and (6) the recent description of similar cases occurring during P A S therapy, it seems that this is a case of toxic hepatitis due to P A S

EVELYN HESS
D G ISMAY

Tuberculosis Unit
West Middlesex Hospital
Isleworth.

SIR,—The following case is essentially similar to those described by Dr Cuthbert and correspondents who have written since his letter appeared

The patient was a youth, aged 19, with fairly long standing productive tuberculosis in the left upper lobe The lesion was cavitated, and there was evidence of localised endobronchitis with slight recent deterioration. He had been afebrile for some months and was in good general condition.

On July 15 1950, streptomycin 1 g daily and P.A.S 15 g daily was begun There was no diarrhœa, vomiting or anorexia, but on the 20th day of treatment the patient complained of lassitude and was found to have a temperature of 100°F The next day he became more ill and towards the evening complained of frontal headache, shivering, and a hot skin. The temperature rose to 103 5°F and the pulse rate to 120 per min., but there were no other physical signs On the 23rd day the temperature rose to 104 5°F, and simultaneously the patient developed a generalised papulo-erythematous rash, which began on the backs of the hands and spread from the extremities to the trunk and face The palms and soles escaped, and itching was confined to the latter He also complained of a severe sore throat with difficulty in swallowing the throat was very red and slightly œdematous The tongue was heavily coated His face was flushed and looked puffy, and there was well marked injection of the conjunctivæ No enlarged glands were felt

The next day he appeared extremely ill, with malaise and prostration, in the evening the temperature again reached 104 5°F, and the rash had become more noticeable Up to this time blood-counts had shown 8–12% monocytes but were otherwise normal, throat-swabs had shown no pathogens and three specimens of urine had shown no albumin, cells, or casts No icterus developed

On the 25th day P.A.S and streptomycin were discontinued The temperature promptly fell to normal and the rash faded within 48 hours without subsequent desquamation. Patch tests on Aug 12 with 20% P.A.S 20% sodium salicylate and 20% streptomycin were all negative There were no further developments and the patient seemed quite well The Paul Bunnell reaction was negative

On Aug 21, 0·5 g P.A.S was given. Within 3 hours the patient complained of generalised itching and shortly afterwards of sore throat and the rash began to recur There was no fever headache or malaise The symptoms subsided within 9 hours

Desensitisation to P.A S was begun on Aug 23 with a daily dose of 100 mg which has been gradually increased. This has so far been carried out uneventfully No anti histamine drugs have been used

Twenty six other patients have been treated with similar doses of the same preparation of P.A.S, and other than diarrhœa and anorexia in three cases there have been no toxic reactions

Military Hospital Cowglen
Glasgow R G GIBBS

PROPHYLACTIC INOCULATION AND POLIOMYELITIS

SIR,—The present anxiety in regard to a possible connection between inoculation against diphtheria and the occurrence of poliomyelitis raises many questions One of these concerns the method of inoculation

Practically all authorities have advocated the intramuscular route Many years ago, when we were working with the original A P T preparations of the Wellcome laboratories, we encountered sterile abscesses from time to time These still occur, though in an insignificant proportion of cases It has always seemed to me that while the occurrence of such abscesses remained a possibility, it was better that they should be superficial than deep, and, accordingly, we have invariably administered these antigens by the subcutaneous route

As I understand it, the present view appears to be that the injection of a foreign material into the substance of a muscle may have an irritant effect on nerve endings and predispose them to the lodgement of poliomyelitis virus This is, of course, hypothesis only, but it may be worth investigating The main difficulty in this will, I think, be that in practically all cases previously inoculated the injection will have been made by the intramuscular route

We have been fortunate in escaping poliomyelitis in this area In the past three years only five cases have come to our notice, and in only one of these was there a history of immunisation The child concerned had received a single injection of P T.A.P five months before the onset of the disease, and in his case the right leg was affected, the arms having completely escaped

J C SAUNDERS
City Medical Officer
Cork

PSEUDOMONAS AERUGINOSA

SIR,—We wish to appeal for strains of *Pseudomonas aeruginosa* We have carried out, with some measure of success, work with a view to producing type specific bacteriophages capable of lysing *Ps aeruginosa* We have, however, been able to deal only with strains obtained from the West of Scotland, and we should like, if possible, to get strains from other parts of the country

Any cultures sent to Professor Todd at the address given below will be gratefully acknowledged, and, if desired, the results of our findings will be communicated to the centre concerned. Cultures should be accompanied by a note giving details of source and date of isolation

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not seem to give much weight to this objection, since she uses the cases as arguments against the traction theory She concludes that this theory cannot be maintained pointing out, however, that at present there is "no alternative theory to offer, it appears probable that the Arnold Chiari malformation takes place at an early stage of embryonic development, perhaps at the stage of closure of the medullary canal, as suggested by Schwalbe Gredig"

In 1941[2] and 1946[4] I described two fœtal cases of spina bifida with hydrocephalus internus and the Arnold Chiari malformation

CASE 1—A fœtus of 63 mm Spina bifida partim aperta et partim subcutanea, diastematomyelia thoracica et lumbo sacralis, myelocele thoracolumbale The tip of the conus medullaris behind the body of the 3rd sacral vertebra—i e at a level normal for the fœtal stage, the medullary 2nd cervical segment on a normal level behind dens epistrophei Hydrocephalus internus Stenosis of the mesencephalic aqueduct Malformation of the rhombencephalon with plunging and deformity of the vermis cerebelli (evidently an Arnold malformation at an early stage of development)

CASE 2—A fœtus of 115 mm Spina bifida subcutanea, myelocystocele in the lower part of the back Accurate calculation of the vertebræ not possible owing to pronounced segmental anomalies Obviously, however, the ascensus medullæ spinalis had been obstructed since the tip of the conus medullaris was on a level with the 3rd vertebra from the caudal end of the spinal column The medullary 2nd cervical segment on a normal level behind dens epistrophei Hydrocephalus internus Deformity of the rhombencephalon with plunging of the cerebellum in much the same way as in case 1

In each of these two cases we evidently have the initial stage of an Arnold malformation In one case the ascensus medullæ spinalis had not yet asserted itself, and in the other it had not yet appeared in the upper cervical region Thus, as I pointed out in 1946,[4] van Houweninge Graftdijk's traction theory cannot be applied to these two cases I concluded that the primary cause of the malformation is unknown but is the same factor that causes spina bifida It is possible that in both my cases an interaction arose at an early fœtal stage between hydrocephalus internus and the cerebellum rapidly growing in the posterior fossa But it is impossible to say which was the earlier abnormality—the hydrocephalus or the cerebellar malformation It may be supposed that in case 1 the stenosis of the aqueduct first caused the hydrocephalus, but this is, of course, by no means certain

It should perhaps be emphasised that in these two cases we are dealing with an Arnold but not with a Chiari deformity Really there is no reason to assume that these two components of the Arnold Chiari malformation must have a common origin In these two cases, further development traction by the spinal cord (as suggested by van Houweninge Graftdijk) might perhaps finally have completed the picture by giving rise to a Chiari malformation

One cannot always dismiss van Houweninge Graftdijk's traction theory merely because it cannot be applied to *some* cases In case 1 the aqueduct stenosis may have been the first visible cause of the deformity of the rest of the hind-brain The origin of a deformity which eventually seems homogeneous may, I believe, vary from case to case within certain limits One must also take care not to consider the morphogenesis of these malformations simply from a mechanical point of view The normally growing organism tends, irrespective of accidental external influences, to attain a certain functional form (the "Gestaltungsfunktion" of Roux 1895) This function may be disturbed in case of malformation so that the initially abnormal organism has a propensity towards an anomalous form This form it endeavours to attain by all available means

Lund Sweden OLOF ASK

[4] Ask, O *Ibid*, 1946 51 259

EDUCATION FOR GENERAL PRACTICE

SIR,—May I supplement Dr Naish's excellent letter last week from the point of view of coöperation between the local authority and the general practitioner?

Her statement "I have proved that local authorities can take children away from the G P only if he is willing" may, I think, be a little misleading The local authority in York have done everything in their power to assist Dr Naish in establishing her own infant welfare clinic One of our health visitors attends her clinics and plays the same rôle as a health visitor in a local authority clinic, seeing a large proportion of the patients, weighing babies, and giving advice where necessary Our aim in this city is to interest general practitioners in preventive medicine and to assist them where possible to undertake this work for their own patients It is only fair, therefore, to point out that the infant welfare clinic cited by Dr Naish is a joint local authority and general practitioner clinic

C B CRANE
Medical Officer of Health

York.

ENURESIS AND HYPERSOMNIA

SIR,—I was very interested in Dr Meyer's letter of Sept 16 and the description of his two cases I must point out, however, that my article (July 22) dealt with *adults only*, hence Dr Meyer's remarks are not relevant to my observations

There is today much disagreement among child psychiatrists, pædiatricians, and urologists on the ætiology of enuresis in childhood Thus to be dogmatic on this subject is to ask for trouble This was one of the reasons why I did not consider enuretic children in my series of cases Dr Meyer quotes only two cases, but I would refer him to the letter from Dr Lewsen, in your issue of Aug 12 where there would appear to be evidence that my theory could apply to children as well I have made no claim that it does Child psychiatrists will agree, I am sure, that a large number of enuretic children do not respond to psychological treatment in spite of ingenious (and often specious) arguments that are put forward to support a psychogenic basis in the various cases The difficulty is that these theories cannot be proved or disproved and therefore involve a large element of faith

Finally, it was certainly not my intention to convey that enuresis in adults is secondary to deep sleep I was at pains to show that the two symptoms were part of a syndrome which is central in origin

Runwell Hospital
nr Wickford Essex R STRÖM-OLSEN

THE PSYCHIATRIC SOCIAL WORKER

SIR,—I should like to endorse Dr Creak's statement last week that the contribution made by psychiatric social workers to mental health is invaluable

Yet another aspect of their plight has not so far become generally known I refer to the recent ruling of the Ministry of Health on the classification of these workers for superannuation purposes

Before the appointed day psychiatric social workers in mental hospitals were classified as class I asylum officers with a retiring age of 55 and a contribution to the superannuation fund of 3% of their salaries After the health service started they were given the option of remaining in the old asylum officers' scheme or joining the National Health Service superannuation scheme, to which they would contribute 6% of their salaries

No indication was given that the pension would be less, and nothing was said to suggest that the retiring age was to be raised In the event it appears that this is the case The Ministry of Health has refused to classify psychiatric social workers as mental health officers, which means that many in mental hospitals who decided

A C T H IN PURPURA ANNULARIS TELANGIECTODES

SIR,—I have studied the effect of adrenocorticotropic hormone (A C T H) in a case of purpura annularis telangiectodes (Majocchi's disease)

The patient had numerous typical lesions, the nature of which was proved histologically, on the lower extremities, and in the suprapubic and gluteal regions The lesions started to regress from the 4th or 5th day of treatment, with profound improvement after 12 days The total quantity of A C T.H * administered in this period was approximately 50 mg

Dermatological Clinic
University of Bologna, Italy G BORELLI

SPINA BIFIDA, INTERNAL HYDROCEPHALUS, AND THE ARNOLD-CHIARI MALFORMATION

SIR,—Prof Dorothy Russell has recently given a comprehensive account of the pathology of internal hydrocephalus [1]—an account distinguished by profound personal experience, wide reading, and accurate post-mortem analysis

Professor Russell devotes one of her chapters to the connection between spina bifida, internal hydrocephalus, and the Arnold Chiari malformation A few years ago I published some investigations on this subject, which do not seem to have come to Professor Russell's notice (This is quite natural since at that time the war interfered with communications) I should therefore like to comment on Professor Russell's work

Professor Russell gives the following classification of spina bifida (1) meningomyelocele, (2) meningocele, and (3) spina bifida occulta In 1925 Holmdahl gave the generally accepted definition of spina bifida as a malformation originating from disturbances of three roughly simultaneous, yet fundamentally different, processes of development, which are all essential to the normal evolution of the spinal cord from its open to its closed state These processes are (1) the final closing of the neural tube in the caudal neuropore, (2) the plunging of the embryonic spinal cord into the mass of undifferentiated cells forming the trunk-tailbud, (3) the final detachment of the superficial epithelium from the embryonic spinal cord and from these undifferentiated cells From Holmdahl's and from my own investigations, I have found the best classification of spina bifida to be (1) spina bifida aperta, where the embryonic neural tube remains open, (2) spina bifida subcutanea, where the embryonic neural tube has developed into one (or more) tubes The first class comprises rachischisis and myelocele or meningomyelocele, and the second class all other forms of spina bifida Whether the deformity is cystic or not is of secondary importance in this connection

Professor Russell's classification is not adequate Meningocele is a disputed form of spina bifida Even Denucé (1907) maintained that "la méningocèle pure n'existe pas," and, as far as I know, there has never been described an unequivocal case of pure meningocele —i e, cystic hernia like bulging of the spinal meninges without spinal cord deformity It is, in fact, difficult to find a place for such a deformity in Holmdahl's outline of the morphogenesis of spina bifida malformations It is true that a bulging of the meninges—a meningocele—may be supposed to arise as a later complication of spina bifida, but this is another matter None of the cases in Professor Russell's record fulfils the criteria of a pure meningocele

The conception of spina bifida occulta is also vague Some cases really deserve this name—i e, cases of a non cystic subcutaneous spina bifida—but these are comparatively rare The term has also, and incorrectly, been applied where a simple dehiscence of one or more vertebral laminæ has been misinterpreted as a pathological phenomenon These cases have nothing to do with real spina bifida but are normal variants Throughout infancy—and indeed later—unclosed laminæ in the lumbosacral region are the rule rather than the exception (Hintze 1922, and others) Professor Russell's case 22 seems to be a misinterpreted normal case, so far as the lumbosacral area is concerned, with dehiscence in the sacral laminæ inside a foveola coccygica

Professor Russell's classification does not allow for von Recklinghausen's myelocystocele—a form of spina bifida whose existence was doubted (Leveuf Foulon 1930, Leveuf 1936) but has been proved [2]

With most spinæ bifidæ the embryonic spinal cord does not become detached from the superficial cover at the site of the deformity To the cranial side of the malformation the ascensus medullæ spinalis is obstructed during the continued development of the fœtus, but this obstruction may not arise until after the ascensus medullæ spinalis should normally have begun This, according to Holmdahl (1918), is the 23 mm stage

The ascensus medullæ spinalis is not only a passive cranial dislocation of the medullæ caused by the columna growing away, as it were, from the medulla Comparative anatomy shows that the ascensus, to all appearances, is a teleological phenomenon, intended to provide the spinal cord with a better protection in the flexible vertebral canal.[3]

Around the central malformation in spina bifida are grouped other deformities in varying combinations anomalies of the spinal ganglia and of the vertebræ, incomplete *differentiation of the meninges, and deformities* in more remote organs (polycystic kidneys, double thumbs, &c) These are parallel phenomena—the expression of a general tendency towards abnormal growth The question is what is the genetic connection between, on the one hand, the Arnold Chiari malformation and, on the other hand, spina bifida and hydrocephalus internus ?

Arnold (1894) explained the cerebellar malformation as a *deformity sui generis*, appearing collaterally to spina bifida and caused by a transposition of tissue-elements Chiari (1895) interpreted the malformation of medulla oblongata as the consequence of congenital hydrocephalus internus in the developing brain Schwalbe Gredig (1907) declared that the genesis of the *Arnold Chiari malformation had not yet been established* and that either the deformity may arise independently of spina bifida, or else a causal connection exists so that the spina bifida may (though it need not) cause the Arnold Chiari malformation van Houweninge Graftdijk (1932) suggested that the *Arnold Chiari malformation* is caused through traction on the rhombencephalon by the caudally tethered spinal cord, and this causes the hydrocephalus by a valvular action in the foramen occipitale magnum Russell Donald (1935), too, suggested a valvular action by the *deformed rhombencephalon*, though with a different mechanism Lichtenstein (1942) attributed to tethering of the spinal cord the Arnold Chiari malformation and stenosis of the mesencephalic aqueduct, and thus, indirectly, internal hydrocephalus

Professor Russell emphasises that the Arnold Chiari malformation is often found with spina bifida since 1935 "no example of meningomyelocele has been examined without finding an associated Arnold Chiari malformation" (How many examples of meningomyelocele and of other forms of spina bifida have been examined ?) Professor Russell s experience may be summarised as follows (1) in cases of spina bifida with an obstruction of the ascensus medullæ spinalis and with hydrocephalus internus, an Arnold Chiari malformation is found often, though not always, (2) in other conditions the Arnold Chiari malformation is found not at all or only very occasionally Furthermore these rare cases are not unexceptionable, according to Professor Russell, since the spinal cord was not examined Professor Russell herself, however, does

* From the Farmigea Laboratories, Pisa.

1 Russell D S Observations on the Pathology of Hydrocephalus. *Spec Rep Ser med. Res Coun. Lond.* no 265 H.M. Stationery Office See *Lancet* 1949, 1, 920

2 Ask O *Upsala Läkaren Förh* 1941 46 243

3 Ask O *Ibid* 1944 50 81

not seem to give much weight to this objection, since she uses the cases as arguments against the traction theory She concludes that this theory cannot be maintained, pointing out, however that at present there is "no alternative theory to offer, it appears probable that the Arnold Chiari malformation takes place at an early stage of embryonic development, perhaps at the stage of closure of the medullary canal, as suggested by Schwalbe Gredig"

In 1941[3] and 1946[4] I described two fœtal cases of spina bifida with hydrocephalus internus and the Arnold Chiari malformation

CASE 1—A fœtus of 63 mm Spina bifida partim aperta et partim subcutanea, diastematomyelia thoracica et lumbo sacralis, myelocele thoracolumbale The tip of the conus medullaris behind the body of the 3rd sacral vertebra—i.e at a level normal for the fœtal stage, the medullary 2nd cervical segment on a normal level behind dens epistrophei. Hydrocephalus internus Stenosis of the mesencephalic aqueduct. Malformation of the rhombencephalon with plunging and deformity of the vermis cerebelli (evidently an Arnold malformation at an early stage of development)

CASE 2—A fœtus of 115 mm. Spina bifida subcutanea, myelocystocele in the lower part of the back Accurate calculation of the vertebræ not possible owing to pronounced segmental anomalies Obviously, however, the ascensus medullæ spinalis had been obstructed since the tip of the conus medullaris was on a level with the 3rd vertebra from the caudal end of the spinal column. The medullary 2nd cervical segment on a normal level behind dens epistrophei Hydrocephalus internus Deformity of the rhombencephalon with plunging of the cerebellum in much the same way as in case 1

In each of these two cases we evidently have the initial stage of an Arnold malformation. In one case the ascensus medullæ spinalis had not yet asserted itself, and in the other it had not yet appeared in the upper cervical region Thus, as I pointed out in 1946,[4] van Houweninge Graftdijk's traction theory cannot be applied to these two cases I concluded that the primary cause of the malformation is unknown but is the same factor that causes spina bifida It is possible that in both my cases an interaction arose at an early fœtal stage between hydrocephalus internus and the cerebellum rapidly growing in the posterior fossa But it is impossible to say which was the earlier abnormality—the hydrocephalus or the cerebellar malformation It may be supposed that in case 1 the stenosis of the aqueduct first caused the hydrocephalus, but this is, of course, by no means certain

It should perhaps be emphasised that in these two cases we are dealing with an Arnold but not with a Chiari deformity Really there is no reason to assume that these two components of the Arnold Chiari malformation must have a common origin In these two cases, further development traction by the spinal cord (as suggested by van Houweninge Graftdijk) might perhaps finally have completed the picture by giving rise to a Chiari malformation

One cannot always dismiss van Houweninge Graftdijk's traction theory merely because it cannot be applied to *some* cases In case 1 the aqueduct stenosis may have been the first visible cause of the deformity of the rest of the hind brain. The origin of a deformity which eventually seems homogeneous may, I believe, vary from case to case within certain limits One must also take care not to consider the morphogenesis of these malformations simply from a mechanical point of view The normally growing organism tends, irrespective of accidental external influences, to attain a certain functional form (the "Gestaltungsfunktion" of Roux 1895) This function may be disturbed in case of malformation so that the initially abnormal organism has a propensity towards an anomalous form This form it endeavours to attain by all available means

Lund, Sweden OLOF ASK.

[4] Ask, O *Ibid* 1946 51 259

EDUCATION FOR GENERAL PRACTICE

SIR,—May I supplement Dr Naish's excellent letter last week from the point of view of coöperation between the local authority and the general practitioner?

Her statement "I have proved that local authorities can take children away from the G P only if he is willing" may, I think, be a little misleading The local authority in York have done everything in their power to assist Dr Naish in establishing her own infant-welfare clinic One of our health visitors attends her clinics and plays the same rôle as a health visitor in a local authority clinic, seeing a large proportion of the patients, weighing babies, and giving advice where necessary Our aim in this city is to interest general practitioners in preventive medicine and to assist them where possible to undertake this work for their own patients It is only fair, therefore, to point out that the infant welfare clinic cited by Dr Naish is a joint local authority and general practitioner clinic

York. C B CRANE
Medical Officer of Health.

ENURESIS AND HYPERSOMNIA

SIR—I was very interested in Dr Meyer's letter of Sept 16 and the description of his two cases I must point out, however, that my article (July 22) dealt with *adults only*, hence Dr Meyer's remarks are not relevant to my observations

There is today much disagreement among child psychiatrists, pædiatricians, and urologists on the ætiology of enuresis in childhood Thus to be dogmatic on this subject is to ask for trouble This was one of the reasons why I did not consider enuretic children in my series of cases. Dr Meyer quotes only two cases, but I would refer him to the letter from Dr Lewsen, in your issue of Aug 12 where there would appear to be evidence that my theory could apply to children as well. I have made no claim that it does Child psychiatrists will agree, I am sure, that a large number of enuretic children do not respond to psychological treatment in spite of ingenious (and often specious) arguments that are put forward to support a psychogenic basis in the various cases The difficulty is that these theories cannot be proved or disproved and therefore involve a large element of faith

Finally, it was certainly not my intention to convey that enuresis in adults is secondary to deep sleep I was at pains to show that the two symptoms were part of a syndrome which is central in origin

Runwell Hospital, nr Wickford Essex. R STRÖM-OLSEN

THE PSYCHIATRIC SOCIAL WORKER

SIR,—I should like to endorse Dr Creak's statement last week that the contribution made by psychiatric social workers to mental health is invaluable

Yet another aspect of their plight has not so far become generally known I refer to the recent ruling of the Ministry of Health on the classification of these workers for superannuation purposes

Before the appointed day psychiatric social workers in mental hospitals were classified as class I asylum officers with a retiring age of 55 and a contribution to the superannuation fund of 3% of their salaries After the health service started they were given the option of remaining in the old asylum officers scheme or joining the National Health Service superannuation scheme, to which they would contribute 6% of their salaries

No indication was given that the pension would be less and nothing was said to suggest that the retiring age was to be raised. In the event it appears that this is the case The Ministry of Health has refused to classify psychiatric social workers as mental health officers, which means that many in mental hospitals who decided

to enter the new National Health superannuation scheme will now receive considerably smaller pensions than under the asylum officers' scheme, and at a retiring age of 60 Not only that, but the refusal to classify these workers as mental health officers has at one clean administrative stroke reduced their status to that of the mental hospital clerical worker

It would seem that the position in the health service of small groups of ancillary workers, possessing no strong political lobby, is sorry indeed

London S W 5 M POTT

PROTHROMBIN CONSUMPTION DURING MENSES

SIR—Impairment of blood coagulation in women during menses has often been suspected By means of Quick's[1] consumption test, which has enabled us to detect some latent deficiencies of blood coagulation in various disorders, such as thrombocytopenia,[2] we have found quite constantly that, in normal women with normal menses, during the menstrual period and especially at its beginning there is a slight but significant reduction of prothrombin consumption, compared with inter menstrual intervals In many cases the percentage of residual prothrombin 3 hours after coagulation has been about twice as great on the 28th day as on the 14th day The number of platelets varies inversely with the residual prothrombin

Slight thrombocytopenia immediately before and at the beginning of the menses has often been described[3], this was accurately demonstrated by our co worker, Rovatti,[4] and was confirmed by us The decrease of prothrombin consumption during the menses is, however, greater than would be expected from a simple pre menstrual and menstrual diminution in the number of platelets, and this leads us to suspect a functional, transitory insufficiency of platelets (their agglutinability and adhesiveness are diminished during menses), but perhaps during menses there is also deficiency of other coagulation factors

A BASERGA
P ROSTI
R FURIAN

Department of Internal Medicine
University of Pavia

PSYCHOSOMATIC MEDICINE

SIR,—Professor Pickering's somewhat disingenuous reference to psychosomatic medicine (July 15) has evoked a spate of trenchant replies, of which Dr Halliday's (Sept 2) stands out But while any physician aware of the interrelationship of mind and body cannot fail to agree with Dr Ellis (Sept 23) that the earliest phase of clinical teaching should emphasise, for example, the importance of anxiety no less than of cancer in the production of anorexia, can such initial emphasis satisfy the student even in his first week of clinical medicine unless it attempts to include some reference to the causes of this anxiety ?

It is surely here that a confident working liaison between the teacher who is a general physician and the teacher who is a psychiatrist is indispensable to sound or stimulating teaching For lack of it may still lead the student to regard anorexia or any other syndrome based on anxiety as a comparatively trivial or even contemptible complaint in contrast to the same condition when due to cancer or some other "real" cause Encouragement of this attitude of mind by a few general physicians who hold it themselves only aggravates the problem Yet it is precisely the patient whose basic anxiety is neither superficially reasonable nor capable of resolution by purely common sense measures who most needs skilled help and understanding, and whose case most needs adequate demonstration and elucidation for the benefit of future practitioners

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4 Rovatti B Ottolenghi Preti C *Fol ginec Pavia* 1948 43 331

Obituary

ERNEST BOSDIN LEECH

M A, M.D CAMB, HON M A MANC, F R C P, D P H

Dr E Bosdin Leech, consulting physician to the Manchester Royal Infirmary, was the son of Sir Bosdin Leech, a mayor of Manchester who was one of the main promoters of the ship canal and wrote its history, and a nephew of Daniel John Leech, the first professor of pharmacology in the university He went to school at Cheltenham College, and in 1891 he entered Christ's College, Cambridge At that time he had thoughts of reading for the Church, but soon he turned to medicine, and four years later he went to the Manchester Royal Infirmary where his uncle was a physician Qualifying in 1901 he held the usual resident appointments at the infirmary before he set up as a consultant, and when an emergency arose in the resident staff of the infirmary he felt it his duty to give up his consulting rooms and to return as resident medical officer In this post he gave valuable service in the removal of the infirmary from Piccadilly to the new site in Oxford Road Shortly after wards he was appointed to the honorary staff on which he continued to serve until he reached the retiring age in 1938 He was also physician to the Christie Hospital, and he was for many years a most conscientious and respected medical referee under the Workmen's Compensation Act At the medical school he was an enthusiastic teacher, who knew how to share his enthusiasm with his students In 1937 the university awarded him the honorary degree of M A

[F H Schmidt

Leech was president of the Manchester Medical Society in its centenary year Although his antiquarian knowledge was wide, Manchester, and above all Manchester medical history, was his specialty His gift to the university medical library of his collection of books and papers on this subject, including his own monographs on Medicine in the Provinces in England, Picturesque Episodes of Manchester Medical History, and Early Medicine and Quackery in Lancashire, was an important and generous contribution A former president of the Manchester Ancient Monuments Society, he was also a mainstay of the Lancashire Parish Register Society

E T writes "Bosdin Leech was much more than a good physician He came of a family which, on both sides, had a great tradition of public service, and this tradition inspired his work and outlook to the end of his life The social and cultural life of medicine in Manchester owes much to his devoted work He founded the Cambridge Medical Graduates' Club and the very popular Old Infirmary Residents' Club He took his full share in the activities of the various medical societies in the town, and whenever a dinner or anniversary or presentation had to be arranged it was always Leech who did the work He may well be remembered chiefly for his services to the University Medical Library to which he gave many years of devoted work It is due to Leech that we have so fine an instrument of research in all branches of medicine His interests were not exclusively medical, and his days of retirement were made happy by a study of the personal and place names of Lancashire and Cheshire and by the publication of parish registers His motives were ever selfless and without thought of rewards, and he has left his friends many pleasant memories"

Dr Leech married Miss Mary Walder and they had two daughters He died at his home in Manchester on Sept 19 at the age of 75

JOHN CALDERWOOD STRATHEARN

KT, C.B.E, M.D GLASG, F R C.S.E.

Sir John Strathearn, who was for many years warden and chief surgeon of the St John Ophthalmic Hospital in Jerusalem, died at his home near Wimborne on Aug 15, at the age of 71

Graduating at Glasgow in 1901, he spent some time in postgraduate study of his chosen specialty in Edinburgh and Berlin. In 1908 he was appointed assistant surgeon at the British Ophthalmic Hospital in Jerusalem, and in 1911 he returned to this country to settle in ophthalmic practice in Dundee where he had been appointed ophthalmic surgeon to the school board and to the education committee of the Fife County Council In the same year he also took his F.R C.S.E

During the 1914–18 war, service with the R.A.M C took him once more to the Levant, and for his work there he was appointed O B.E. in 1918 During the war the old eye hospital in Jerusalem had been destroyed, and Strathearn was chosen as the man to organise the new one It was a good choice, for he proved an able administrator as well as an excellent surgeon, and the new hospital became his life s work For many years he was also consultant ophthalmologist to the government of Palestine, and he was promoted C B.E in 1928 and knighted in 1936 In a country beset by trachoma his skill as a surgeon was put to good use, and his monograph on the Problem of Blindness in Palestine, published in the *Folia Ophthalmologica Orientalia* in 1933, was both cogent and comprehensive Though he returned to England in 1940 because of ill health, he continued to work at Goodmayes Emergency Hospital until he retired to Dorset in 1946

Lord Webb-Johnson, hospitaller of the Order of St John writes "Sir John Strathearn will always hold an honoured place in the history of the Order of St John. His long devoted, and distinguished services as warden of the Ophthalmic Hospital in Jerusalem added lustre to its annals The hospital had a tradition of service of over eight centuries before Strathearn joined the staff, but he raised its prestige so that it became a household word throughout the Middle East The fame of the hospital and its warden spread not only through the Holy Land but through the wider areas of the surrounding countries—into Syria and Transjordan and even across Arabia for the Bedouins also sought advice and treatment Strathearn s quiet efficiency and operative skill attracted many pupils and secured the adherence of competent assistants while his courtesy modesty patience, sympathy and understanding endeared him to those with whom and for whom he worked A great citizen of his country, Strathearn was one of whom Britain may well be proud He was an idealist and he had the urge to serve his fellow men, which his mission in Palestine satisfied The fame and honour that came to him were fully earned and richly deserved.

GILBERT SMITH

M.D DURH., F.R C.S

Dr Gilbert Smith, who died at Hindhead on June 22, was the second son of Sir Thomas Smith, sometime surgeon extraordinary to Queen Victoria and honorary serjeant surgeon to King Edward VII He was educated at Marlborough and St Bartholomew's Hospital, where he qualified in 1896 at the age of 19 He obtained the F R C.S in 1899, and a year later the M.D Durh with a gold medal for his thesis on actinomycosis He was house-surgeon at Barts to Mr Walsham and clinical assistant in the children s department of the Middlesex Hospital before, in 1900, he joined the late Dr Arnold Lyndon in general practice at Hindhead The neighbourhood was then coming to be recognised as a health resort and by 1912 the work had so increased that two additional partners had to be taken into the firm. In the first world war Gilbert Smith went to France with the Red Cross and later, in 1917 he joined the R.A M C and worked as a surgical specialist at a base hospital in Rouen

Gilbert Smith was one of the earliest car owners in Hindhead and a friend recalls the Maberley car which he drove in 1902 It had one wheel in front, one wheel on each side and one wheel behind. The body was S shaped the driver facing one side of the road his passenger the other There was no protection of any kind from the weather The car was belt-driven and the engine being only 2½ h p necessitated the passenger always and the driver often having to dismount on a hill and, walking beside the car, steer it by means of a tiller" A keen sportsman, in his early days at Hindhead he was captain of the golf club He took his holidays in Scotland and Yorkshire, fishing and shooting

He married in 1900 Elizabeth Adelaide Carson, who, with four sons and two daughters, survives him.

FRANCIS JAMES STRONG HEANEY

M.A., M D DUBL., F.R C S.I

Mr F J Strong Heaney, consulting surgeon to the Royal Liverpool United Hospital, died at Christleton, near Chester, on Aug 26, at the age of 76

He was educated at Dundalk School and Trinity College Dublin, where he gained the Stewart medical scholarship and graduated B CH. in 1901 with honours After obtaining the higher qualifications of M.D and F R C.S.I., he continued his studies in New York and Paris, and his enthusiasm for the language and literature of France never flagged through a long and busy life.

Strong Heaney joined the R.N V R shortly after he started practice in Liverpool, and he hurried home from his honeymoon in France to join his ship two days before the outbreak of the 1914–18 war After serving for over two years in H.M.S *Plassey* he was appointed Admiralty surgeon and agent in Liverpool and on reaching the age-limit he was retired with the rank of surgeon captain

After the war, he joined the staff of the Liverpool Stanley Hospital and the Liverpool Radium Institute as surgeon Later he gave his services to the Providence Hospital, St Helens, the Lourdes Hospital, the County Hospital, Ormskirk, and the Queen Victoria Hospital, Morecambe The University of Liverpool appointed him a clinical lecturer in the early '20s and prolonged his appointment as did the Royal Liverpool United Hospital, until 1946 some ten years after the usual retiring age

Much of his tireless energy was expended in furthering the interests of his professional brothers For many years he acted as local secretary of the Royal Medical Benevolent Fund In the Liverpool Medical Institution he held several time-consuming offices and he was a regular contributor to the scientific discussions As chairman of the Liverpool Hospital Staffs Association for many years, he proved a persuasive and persevering committee-man and negotiator, and he did much to protect and further the interests of consultants

To students (writes A K. W) Strong Heaney was a patient and kind teacher approachable and very understanding of their difficulties His massive figure with dangling monocle and enthusiastic shining eye will not easily be forgotten by more than a generation of them. No outpatient clinic was dull when enlivened with his ready wit and his appropriate biblical and classical allusions

His appointment to the Radium Institute and Cancer Hospital brought many advanced and almost hopeless cases from a wide area under his care The challenge from these he could not resist and he performed many heroic operations a quarter of a century ago when anæsthesia and resuscitation had not made such procedures commonplace Regard for personal reputation and criticism from his more conservative colleagues never made him refuse a bad surgical risk, if he saw a possible chance of curing or alleviating a desperately ill patient Probably no surgeon in the North of England successfully excised more superior maxillæ and tongues in the pre radium era and later for cases in which radiation had failed

During the early years of the late war when the docks of Liverpool were often a nightly target for the bombers Strong Heaney was a tower of strength in the Stanley Hospital He never failed to appear shortly after an alert was sounded and with no regard to his age he would operate throughout the night and instil courage and calm into a staff which had every reason to be shaken

Strong Heaney married Miss Anne McBurney of

to enter the new National Health superannuation scheme will now receive considerably smaller pensions than under the asylum officers' scheme, and at a retiring age of 60 Not only that, but the refusal to classify these workers as mental health officers has at one clean administrative stroke reduced their status to that of the mental hospital clerical worker

It would seem that the position in the health service of small groups of ancillary workers, possessing no strong political lobby, is sorry indeed

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Notes and News

RESEARCH DEFENCE SOCIETY

IN 1913 this society began publishing an 8-page quarterly report which in 1921 became its official journal with the name of *The Fight Against Disease* Since then great advances have been made in the control of disease and the committee of the society have decided that in future their journal shall be known as *Conquest* Its first issue under this new title has appeared, and in his editorial Dr J D Robertson holds out the hope that the journal will now be printed quarterly, as before the war, or even every two months The striking new cover has been designed by Mr R S Sheriffs and the first issue contains an article on the Conquest of Pain—the Story of Anæsthesia by Dr C J Massey Dawkins and one by Dr E S Duthie on Chemotherapy and Antibiotics in the Control of Disease The journal which is free to members of the society, may be obtained (2s 6d) from the office of the society, 11, Chandos Street, London, W.1

ALCOHOLISM IN FRANCE

EVER since the reign of Louis XIV the French have had the reputation of appreciating quality rather than quantity in eating and drinking Prof Paul Perrin,[1] however, gives a different picture French doctors, it seems are perturbed by the increase in drinking since the war, and Dr Perrin, who is professor of medicine at Nantes and heads the Groupement Médicale d'Études Anti alcooliques has investigated this. He wrote to 1667 medical colleagues 93% of whom agreed that the problem was grave The Frenchman, it is estimated drinks 6 times as much alcohol yearly as the Englishman and nearly 15 times as much as the Norwegian. Before the war he was drinking nearly 3 times as much wine as he did in 1880 and in the intervening period the number of licences had doubled. Though France produces nearly half the wine in the world, she imports 3½ times as much alcohol as she exports In Lyons, according to Professor Perrin, 47% of hospital admissions are attributable to alcoholism 75% of venereal-disease infections occur under the influence of drink and in the west of France alcoholism was thought to be a cause of 30–50% of admissions to mental hospitals.

The theme of Professor Perrin s book, then, is that alcoholism contributes largely to venereal disease tuberculosis mental disorders and road deaths and that it is a greater scourge than cancer Yet the ordinary man is still complacent about it; he believes that wine and beer coming from good grapes or barley, are good foods In Great Britain, as in France, enormous sums are spent in persuading us that it is manly to drink and that alcohol makes us more efficient Social prejudices too encourage drinking many believing that it is bad manners to refuse a drink in company and that wine is indispensable for any celebration.

Professor Perrin shows that during the occupation of France the fall in the consumption of alcohol produced a vast amelioration of evils due to alcoholism. One of his chief points is that alcoholism is not as suggested by some eminent psychiatrists merely a symptom of a psychopathic disposition which would find expression in some other way even if the patient did not drink. There are French villages where 70–90% of the male population is alcoholic and one can hardly suppose that so high a proportion would be psychopathic Psychiatrists have paid too little attention to the environmental factor there are too many social milieus in which people feel compelled for social reasons to drink habitually to excess Professor Perrin therefore urges those who occupy positions of prestige to remain abstinent as long as alcoholism remains the scourge which it is at present

His other suggestions for combating the evil include instruction of the young reduction of licences withdrawal of licences from general stores abolition of slums and the encouragement of sports as well as the manufacture of agreeable soft drinks His hope is that more Frenchmen will follow the example of Pasteur, who preferred to drink his wine while it was still in the grape" He is on less sure ground and much less convincing when he describes a "plot" in Washington to prevent the Prohibition laws from being enforced thus causing them to fail when he insists that the sperm is injured by alcohol so that the children of alcoholics are degenerate - and when he advocates Lecoq s treatment of alcoholism with intravenous alcohol, which has not found favour outside France But these are the pyrotechnics of the enthusiast and do not detract from the importance of his main theme

1 L'alcoolisme problèmes médico-sociaux problèmes économiques Paris L'Expansion Scientifique Française 1950 Pp 420 Fr 1300

THE DOCTOR AND THE LIBRARY

THE library as the tool of medicine—and its possible misuse—was the theme of a symposium held by the medical section of the Library Association in London on Sept 20, with Mr W. R LE FANU president of the section and librarian of the Royal College of Surgeons of England, in the chair Sir CECIL WAKELEY F.R.C.S., said many attempts had been made to coördinate the work of medical libraries Sir William Osler had founded a short-lived association of medical libraries Years later in his turn Sir D Arcy Power promoted a measure of coöperation among the larger medical libraries in London. The Royal Society of Medicine had also made its contribution through the Central Medical Library Bureau which it organised with the help of the Rockefeller Foundation and which served among its other duties, as a clearing house for readers' inquiries The usefulness of the medical section of the Library Association had also proved itself. Its membership now ran into hundreds it had produced a scheme for medical libraries in hospitals and it had a pool for journals "But the real need, Sir Cecil declared, "is for the medical profession to decide what it wants from its libraries.'

Dr C H. KELLAWAY, F.R.S, director of the Wellcome Research Institution, pointed out that in a research institution the library performed a valuable service by providing a survey of the literature for the worker, but care should be taken that the young worker was not overwhelmed with too great a mass

Dr HUGH CLEGG editor of the *British Medical Journal*, was sure that the medical librarian must be more than a mere cataloguer He must have a wide knowledge of medical literature and a trustworthy appreciation of sources—in fact he must be an information officer In a warning reference to "sheets of bibliographies' attached to papers Dr Clegg remarked "In my innocence I once believed that every paper in these bibliographies had at least been dipped into by the author The librarian must have the courage to say 'Is your bibliography really necessary' Mr L T Morton had prepared for UNESCO a world list of journals, abbreviations and abstracting services which, when published, would be invaluable

Mr V ZACHARY COPE agreed that trained medical librarians were essential But use of the library was accompanied by abuse and he often felt sad when he heard young men asking for bibliographies Many people were losing a valuable part of their education in not looking up their own references

MR. GEOFFREY STEPHENS explained that each London borough specialised in one branch of knowledge so that over the whole area no book of importance however expensive, would not be available in one of the public libraries His own library of St Marylebone had been chosen for the medical section. Mr A. J FIELDER, chairman of the Staines group hospital management committee felt that the regional board should coördinate any special library provision. Mr W J BISHOP, secretary of the section and librarian of the Wellcome Historical Library, also supported the view that a public library while it might carry literature for students, could not properly provide a general medical library

1949 IN REVIEW

SOME will remember 1949 as the year in which Middlesex and Yorkshire tied for the county cricket championship, some because for a few short weeks sweets were freed from rationing and still others for the 30% devaluation of sterling on Sept 18 These and a host of other events domestic and foreign, grave and gay are faithfully recorded in the latest *Britannica Book of the Year*[1] Into just over 700 pages 492 authors have crammed well-documented accounts of what passed. Of the 752 entries, one of the most depressing is that concerned with new words for in this company we find bonusable disincentive" dis-saver, down turn (for reduction or falling off in amount &c) 'intervention and redundantize" yet perhaps one day even these will be embraced by the Oxford editors. The volume which is well printed and amply illustrated, would be welcomed at Christmas by anyone who likes to be sure of his recent history

1 Britannica Book of the Year 1950 Events of 1949 Published by Encyclopædia Britannica Ltd. 102 Dean Street, Soho Square, London, W 1 Pp 718 50s

Philadelphia She survives him, with three daughters, one of whom graduated in medicine, and a son, now serving as a Regular in the Army in Malaya

Dr MORLEY FLETCHER

D H writes "A memorial service was held in the fine old church of Petworth on Sept 13, when the Bishop of Rochester delivered a remarkable address He said 'All who knew Dr Fletcher (and to know him was to love him) drew strength and confidence from his serene yet dynamic vitality He so enjoyed life—every moment of it, and God blessed him with a long life, crammed with service and lived with zest'

"By some unknown magic Morley Fletcher never became old When he was over 80, his motor insurance company questioned whether they could cover him any longer, and the young man that came to interview him, after listening for some time to his arguments, said 'It is not you I came to interview, I hoped to see your father'! Fletcher was singularly fortunate and had innumerable friends At Barts he was popular with all Everyone recognised his rare gifts He was always ready to give good advice not only in medicine but also on a wide range of other subjects Nothing was too much trouble Thus he once went all the way to Norfolk to see a colleague's child, who was not so very ill, and refused to accept any kind of reward, not even his travelling expenses There must be many old students who can remember similar kindnesses given without any thoughts of himself He had a grand personality, a great life—every minute of which he enjoyed May God bless him"

Public Health

Poliomyelitis

IN the week ended Sept 16 notifications of poliomyelitis in England and Wales were paralytic 291 (327), non-paralytic 187 (186), total 478 (513) The figures for the previous week are shown in parentheses The total decrease compared with the preceding week was 35, all but one of which represented paralytic cases Non-paralytic cases in the week under review comprised 39 1% of the total The uncorrected notifications for the corresponding week in 1947, 1948, and 1949 were 614, 74, and 342

The counties showing the most significant decreases were the West Riding of Yorkshire, Warwick, and Stafford with 16, 10, and 10 fewer cases Maternal increases were recorded in Worcester (12) and Dorset (6) No county area has been free of infection during the six weeks up to and including Sept 16, but only 1 case has been notified in Anglesey and Cambridge, and there have been only 2 cases in the Isle of Ely and Radnor

The total of notifications for 1950 up to and including the week under review was 5604 The corresponding figures for 1947, 1948, and 1949 were 5598, 1288, and 2989

Diary of the Week

OCT 1 TO 7

Monday, 2nd

INSTITUTE OF OPHTHALMOLOGY Judd Street, W C 1
5 30 P.M Mr R C Davenport Retinal Vasculitis

Tuesday, 3rd

INSTITUTE OF DERMATOLOGY Lisle Street, W C 2
5 P M Dr R M B MacKenna The History of Dermatology

Wednesday, 4th

INSTITUTE OF DERMATOLOGY
5 P.M Dr C W McKenny X ray Techniques

Thursday, 5th

LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE, Keppel Street, W C 1
5 15 P.M. Sir Philip Manson Bahr Patrick Manson—the Father of Tropical Medicine (First Manson lecture)

INSTITUTE OF DERMATOLOGY
5 P M Dr R T Brain Physiotherapy and Electrotherapy

Saturday, 7th

BRITISH ASSOCIATION OF ALLERGISTS
11 A.M (York County Hospital) Dr H F West 'Allergy in Rheumatism Dr H Royle X ray Appearances in Asthma
2 15 P.M Dr L M. Rosa The Human Bronchus a New Test in Experimental Physiology Dr C A Clarke Asthma Treatments Old and New Dr H R Vickers The Rôle of Allergy in Dermatitis

Appointments

BEALES P H M B Lond, F R.C.S E consultant ear, nose, and throat surgeon, Montagu Hospital, Mexborough with duties at Doncaster Royal Infirmary, Victoria Hospital, Worksop and certain school clinics
BOWERS, R E, M D Lond, M R.C P consultant dermatologist, North Gloucestershire clinical area
CHAMBERLAIN ROMA M B Brist. D C.H, D OBST asst. M O.H. and asst school M O Reading
CHANCE PHOEBE, M R C.S asst county M O, Notts
CLARK, D H, M.A., M.B Edin, M R C.P E, D P.M registrar, Maudsley Hospital London
GIBB G M, M B St And, D P M physician in psychiatry, Bristol Mental Hospital.
JACKSON, DANIEL M A, M B Glasg, D P M county psychiatrist, Cornwall
MACLACHLAN, JAMES, M B Glasg D P.H deputy M O H., Walsall.
PHILLIPS, J B M D Lond, D P M physician in psychiatry Bristol Mental Hospital
ROBSON, T W M B Edin, D P H M O.H. and senior M O, Dewsbury
WILLIAMS, R S, M B Lpool. senior registrar, Broadmoor Institution Crowthorne, Berks

Colonial Service

ALLAN, A M M.B Edin M O, Tanganyika
ALLAN, W G L M B Aberd M O Tanganyika
BLAIKIE, K W M B Edin M O Uganda
BURY, E J M R C.S, D T.M & H., D P H director of medical services Gambia
COOPER, S G PH.D Lond., B SC Reading, M R C.S, D T.M & H pathologist Mauritius
GORROD, C E, M B Aberd D.P H M O.H, Kenya
SHAW, G I M B Glasg D T M & H D.P.H deputy director of health services, Hong Kong
SMART G B M B. Calcutta F.R F P.S D.P H, D T.M & H patholo gist Hong Kong
SUBRYAN C R M B N U I, D.P H deputy director of medical services (health) British Guiana
UTTLEY, K. H M.A M D Camb D T.M & H deputy director of medical services Hong Kong
YEO K C M.D Hong Kong D P H D T.M & H deputy director of medical and health services Hong Kong

Births, Marriages, and Deaths

BIRTHS

ALLEN —On Sept 18 the wife of Dr H W Allen—a daughter
BARWELL —On Sept 20 at St. Ives Cornwall the wife of Dr T E Barwell—a daughter
BOGDANOVITCH —On Sept. 22 the wife of Dr Andrew Bogdanovitch —a son
FINE —On Sept 13, in Sheffield the wife of Dr Gerald Fine—a son
HIRST —On Sept 9 in Leeds to Dr Stella Hirst (née Speight), wife of Dr John Hirst—a son
LEIGH —On Sept. 16 the wife of Dr P R W Leigh—a son
LEVINSON —On Sept 19 in London to Dr Frances Levinson (née Dove) wife of Mr Ellis Levinson—a son
LEWIN —On Sept. 17 at Hengoed Glam, the wife of Dr Denis Lewin—a daughter
MUSSELWHITE —On Sept 16, the wife of Dr D H Musselwhite—a son
O'BRIEN —On Sept 7 at Cowes, Isle of Wight, the wife of Dr Donal O Brien—a son.
RICHARDS —On Sept 18, at Llanelly, the wife of Dr T H Richards —a daughter
SILVER —On Sept. 16 the wife of Dr P S Silver—a daughter
WILKINSON —On Sept 18 the wife of Dr Ronald Wilkinson—a daughter
WILLIAMS —On Sept 18 at Southsea the wife of Mr Bernard Williams F R C S —a daughter

MARRIAGES

COKE—POOLE —On Sept 15 in London, Frank Coke, F.R C.S, to Elsie Poole
HOWARD—BENNETT —On Sept 16, James Brian Howard M B, to Mary Bennett
JENNINGS—BABER.—On Sept. 9 at Bushey Heath Geoffrey Hales Jennings F.R.C.P to Margaret Doreen Baber M.D
MOODY—LAVERS —On Sept. 16, in Hamburg, William Paul C R. Moody captain R A M.C to Marion Annetta Lavers lieutenant, Q.A R.A.N C

DEATHS

BRENNAN —On Sept. 12 at Killarney, Charles Henry Brennan, M C L.R C P.I D P H major, R.A.M C retd
BRODRIBB —On Sept 16 at St. Leonards Arthur Williamson Brodribb M.A. B M Oxfd
ELLIOTT —On Sept. 18 in London Patricia Ruth Elliott, M.B.E, M B Lond. aged 63
FIELDING —On Sept 15 Saville James Fielding M B Durh, aged 69
GARNER —On Sept. 16 at Flixton Lancs Charles Garner, M D Manc, aged 75
HARRIS —On Sept 16 in London, Charles Harris L.R C.P E D.P H aged 65
LEECH —On Sept. 19 in Manchester Ernest Bosdin Leech M.A, M D Camb, F R.C.P D P.H aged 75
LEYS —On Sept 15, at Grantown on Spey John Leys M.A, M D Aberd aged 85
MACLEOD —On Sept. 9, at Inverness Donald Macdonald MacLeod F R.C.S.E
PURSLOW —On Sept 20, in Birmingham Charles Edwin Purslow, M D Lond M R.C.P aged 89
RAWLENCE —On Sept. 17 Harold Ernest Rawlence O B.E, M D Edin F.R C.S E

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NOV 1950 P-135

As originally planned, this issue was to have 54 pages of text Their number was successively reduced to 40 and 36, and we now present a residual 8 Nor are all of them those we should have chosen had our choice been free We can only beg our readers to remain indulgent during the further weeks, months, or years required for settlement of the dispute that is again immobilising London printers

Hæmagglutination Test for Tuberculosis

A SEROLOGICAL test for tuberculous infection as reliable as the Wassermann reaction in syphilis would be of immense value to the clinician, but despite the multitude of agglutination, complement fixation, and precipitin methods devised in the last 50 years none has proved wholly satisfactory Two years ago MIDDLEBROOK and DUBOS[1] introduced a hæmagglutination test which they claimed could detect small amounts of antibody produced against one or more of the polysaccharide antigens in mammalian strains of the tubercle bacillus Washed red cells from the sheep are sensitised with an active antigenic fraction from an extract of the tubercle bacillus or from commercial preparations of old tuberculin The sensitised cells are then added to dilutions of inactivated serum from the patient, if the test is positive the sheep cells are agglutinated and when shaken appear as clumps in the supernatant fluid A complication is that all heterophile antibody must be removed from the serum before adding it to the sensitised cells

The Middlebrook Dubos test has been tried by several workers here and in France, and ROTHBARD[2] and associates in the United States obtained negative results in 203 of 216 non tuberculous patients, whereas 155 out of 168 cases of active tuberculosis gave positive hæm agglutination in titres of 1 8 to 1 512 Monthly tests on 120 tuberculous patients showed a gradual disappearance of antibodies with clinical improvement These findings suggest that the test would be highly valuable in active tuberculosis, but those of SMITH and SCOTT[3] are less encouraging They found agglutinins in 83 out of 104 sera from phthisical patients with tubercle bacilli in the sputum and in 6 whose sputum was clear, the negative sera mostly coming from patients with advanced disease and a poor prognosis Most of the few tests done on patients with arrested tuberculosis were negative, as were 18 out of 22 on syphilitic patients They have also investigated the relation of the test to tuberculin sensitivity Half of 70 healthy tuberculin positive people gave positive hæmagglutination reactions, and nearly a third of 68 healthy students developed hæmagglutinins after their first tuberculin test Similarly, out of 13 students inoculated with B C G, 10 developed hæmagglutinins though all 13 gave positive tuberculin reactions

The finding of hæmagglutinin clearly does not prove that active infection is present, though MIDDLEBROOK[4] suggests that with a reliable antigen a serum titre of 1 8 or higher is presumptive evidence of disease caused by the tubercle bacillus or an antigenically related mycobacterium Apparently the reaction does not measure either the patient's resistance to tuberculosis or the activity of the tuberculous process, and the possibility of false positive or false negative reactions has yet to be eliminated For the present, at least, the test will not take the place of isolation and identification of the infecting organism, which in tuberculosis, as in other infectious diseases, is by far the surest method of diagnosis

1 Middlebrook G Dubos R J exp Med 1948 88 521
2 Rothbard S Dooneiff A S Hite K E Proc Soc exp Biol N Y 1950 74 72
3 Smith D T, Scott A B Amer Rev Tuberc 1950 62 121
4 Middlebrook G Ibid p 223

Annotations

THE REPRESENTATIVE MEETING

TWO urgent problems facing the British Medical Association—first, the work and status of the general practitioner, and secondly the position of the association itself in these changed days—were brought into sharp relief last week when the annual meeting of representatives, adjourned from Southport[1] was completed in London.

The association will evidently have a stiff fight in its campaign to gain more beds for general practitioners A North Country representative reported continuing displacement of practitioners from hospital posts, while a London spokesman said that in his area, though the work of hospitals could not be carried through without the continuing help of G P clinical assistants, their future was still in doubt At the meeting the most stringent criticism was reserved, however, for the report on the G P's training[2] It was argued that the proposed three years postgraduate training would deter people from entering practice and might impose a heavy financial burden Furthermore, if he did study for these extra years, the practitioner should gain an income more in keeping with the specialist s Dr J C Arthur declared that what the young doctor needed was not more training but more confidence to apply the knowledge he had already gained, and if he was to enter practice with this added confidence his teachers must undergo a change of heart More than one representative feared that the Cohen report s insistence on these further years might become the basis of action by the Ministry of Health Let us not, ' as one put it "give the Minister another chain to fetter us ' Sir Henry Cohen retorted that the best practitioners already put in the extra period of study and the report was concerned not with politics but with education His answer did nothing to still the prevalent disquiet Alive to the Minister s enhanced powers, representatives are loth to give grounds for action which might in the end prove unwelcome to many in the profession With firm rooting of this fear, constructive endeavour might be brought almost to a halt

TRANSPOSING THE ULNAR NERVE

FROM a study of 46 cases treated at the Wingfield Morris Orthopædic Hospital, McGowan[3] confirms the impression that in cases of traumatic ulnar neuritis and late ulnar palsy one can safely promise that anterior transposition of the nerve will prevent any further sensory or motor deterioration in the hand but one cannot guarantee any actual recovery In 21 of her patients the symptoms had developed years after a fracture near the elbow in 10 they were associated with osteo arthritis of the joint (most of these patients were right-handed labourers affected on the right side), and in 3 there was recurrent dislocation of the nerve In 2 patients there was congenital cubitus valgus and dislocation of the head of the radius in another 3 there was local scarring after soft tissue laceration while in the remaining 7 no obvious primary abnormality could be found When the clinical features of ulnar neuritis were slight at the time of operation—i e, when there was no detectable motor weakness and only mild sensory disturbance—there was rapid complete functional recovery In the intermediate group, with intrinsic wasting and weakness and some anæsthesia or analgesia in the hand, though

1 See Lancet July 22 1950 pp 139 148
2 Ibid 1950 1 1001 1008
3 McGowan A J J Bone H Surg 1950 32B, 203

University of Oxford

On Oct 12 the Osler medal will be presented to Sir Ernest Kennaway, F.R S , for his work in cancer research

University of Sheffield

On Sept 23, the following degrees were conferred

M B B.S —Horace Bailey, Patricia T Ferraro W E Freeman, L G Gordon Shelagh Hannath, E A Johnson, F E Neal, N L Sarkar J D Warren.

Dr R F Crampton has been appointed assistant lecturer in physiology

Royal Medico-Psychological Association

Prof A J Lewis will deliver the 25th Maudsley lecture at 1, Wimpole Street, London, W 1, on Friday, Nov 17, at 2 15 P M He has chosen as his subject Henry Maudsley, His Work and Influence

W H O Mission to Korea

A W H O mission to Korea, under the direction of Colonel W H Crichton, is to help reorganise health services, and to assist in relief programmes and in the control and prevention of communicable diseases

Caldecote Hall

The Church of England Temperance Society and National Police Court Mission inform us that they are shortly appointing a resident medical superintendent, in succession to the late Dr A E Carver, at this home for nervous and addiction cases Meanwhile the hall remains open under the charge of a qualified sister and is regularly visited by a doctor

Friends of Vellore

To celebrate the golden jubilee of the Christian Medical College at Vellore, South India, a meeting is being held at the Caxton Hall, Westminster, London, S W 1, on Thursday, Oct 12, at 3 P M , when the speakers will include Dr Sarah Joseph of the Vellore staff The Vellore film will be shown at 5 P M At 5 30 P M Sir George McRobert, F.R C P , will take the chair at a medical meeting which will be addressed by Dr L Chacko, Dr J Donald Ball, and Sir Henry Holland, F R C S E Tickets may be had from Miss Marjorie Chapman, *secretary of the Friends of Vellore*, Annandale, North End Road, N W 11

A Recovery Home

The Birmingham Regional Hospital Board have been asked to approve the use of beds at Little Bromwich Hospital—a large and well equipped infectious-diseases hospital—for recovery cases In the region nearly 60,000 people are waiting for beds, and it is thought that some 20,000 who have only minor ailments could well be transferred, after a short period of intensive treatment at a parent hospital, to Little Bromwich Hospital The acute hospitals can provide medical and surgical facilities for these cases, but the pressure of urgent cases on their beds is so great that they cannot afford to block them with patients who are recovering from the treatment of minor ailments

Courses in the Management of Domestic Staff

The Ministry of Health, by arrangement with the council of Morley College and in coöperation with the Institute of Personnel Management and the Institutional Management Association, is organising at Morley College, London, S E 1, a series of 11 week non residential courses in staff management for those engaged in domestic administration During the present session courses will be held from Jan 1 to March 16 and from April 16 to June 29 Most of the places will be allocated to candidates from the hospital service nominated by their hospital management committee or board of governors Officers who are interested in the courses should consult their committee or board and not the Ministry of Health

"Vitamin P"

At a meeting of the Federation of American Societies for Experimental Biology in Atlantic City in April, the following recommendation of the joint committee on biochemical nomenclature of the American Society of Biological Chemists and the American Institute of Nutrition was adopted

The term vitamin P was first applied to a substance present in lemon juice It was said to be effective in reducing the extent of hemorrhages and extending the duration of life in scorbutic guinea pigs and was also proposed for the treatment of vascular purpura Subsequent studies have failed to substantiate these claims and the identity of a substance of a vitamin nature has not been established Continued application of the term vitamin P to one or another of a group of polyphenolic substances will lead only to confusion It is therefore recommended that the term vitamin P' should no longer be employed.

Sex-hormone Preparations

Manufacturers announce substantial reductions in the price of these products next week.

Charing Cross Hospital

Dr Gordon Holmes, F R.S , will give the inaugural address at this hospital on Thursday, Oct 5, at 4 P.M.

Welsh National School of Medicine

Prof A D Macdonald will give the opening sessional address of this school on Thursday, Oct 5

International Hospital Congress

The second post-war congress arranged by the International Hospital Federation will be held in Brussels from July 15 to 21 1951, on the Care of the Chronic Sick and the Aged

Royal Institute of Public Health and Hygiene

Popular lectures on subjects relating to the public health will be delivered at the institute, 28, Portland Place, London, W 1, at 3 30 P M on Wednesdays, from Oct 18 to Nov 29

Lloyd Roberts Lecture

Sir William Fletcher Shaw will give the 21st Lloyd Roberts lecture at St Mary's Hospital, Whitworth Street West, Manchester, on Tuesday, Oct 10, at 4 30 P.M He is to speak on the Birth of a College

Research Defence Society

Prof E D Adrian, O M , F.R S , will deliver the Stephen Paget lecture on Wednesday, Nov 22, at 5 30 P M , at University College, Gower Street, London, W C 1 He has chosen as his subject Experiments on the Nervous System

St Thomas's Hospital

The old students' dinner will take place at Claridges Hotel, Brook Street, London, W 1, on Friday, Oct 20, at 7 30 P M Dr J P Hedley will be in the chair Tickets (30s) may be had from the hon secretaries, St Thomas's Hospital, S.E 1

French Congress of Gynæcology

To celebrate its jubilee the Société Française de Gynécologie is holding an international conference at Paris from June 23 to 29 1951 Further particulars may be had from M Maurice Fabre, 1, rue Jules Lefebvre, Paris, 9

Hormone to Increase Lamb Production

Ewes receiving injections of gonadotropin have been found to lamb twice in a single year This, the *New York Times* (Sept 18) reports, has been established by a team sponsored by Armour & Co , of Chicago A representative of this firm has estimated that from 100 ewes an additional 65–85 lambs may be obtained in the extra "fall crop"

Isle of Man Health Service

The *Times* (Sept 20) reports that amendments to the National Health Act have been passed in the Manx legislature providing that patients in the Isle of Man in future will have to pay their doctor 6*d* for a form on which prescriptions are written They will also have to take their own container for medicine to the chemist, and pay a dentist a tenth of their account after the first pound The original estimates for the Manx service, which were sent back for revision, came to £800,000 A ceiling of £600,000 has now been placed on expenditure for this year, and the amendments have been made for economy

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The British Standards Institution has issued draft standards for rubber ward dressing gloves and porters gloves for hospital use, for rubber post-mortem gloves, for graduated beakers for injectable fluids in hospitals, and for stainless steel hospital operating theatre and ward holloware

Tropical Ulcer is dealt with in bulletin no 4 of the Ross Institute industrial advisory committee Copies of this and of earlier bulletins are obtainable from L G Ponsford, organising secretary, the Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, Keppel Street, London, W C 1

A brochure illustrating the equipment available from British sources for isotope techniques in medicine, research, and industry has been produced by the Scientific Instrument Manufacturers' Association in collaboration with the Atomic Energy Research Establishment, Harwell Copies may be had without charge, *from the association, 17, Princes Gate*, London, S W 7

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1 Middlebrook G Dubos R *J exp Med* 1948 88 521
2 Rothbard S Dooneiff A S Hite K E *Proc. Soc exp Biol N Y* 1950 74 72
3 Smith D T Scott A B *Amer Rev Tuberc* 1950 62 121
4 Middlebrook G *Ibid* p 223

Annotations

THE REPRESENTATIVE MEETING

TWO urgent problems facing the British Medical Association—first the work and status of the general practitioner and secondly the position of the association itself in these changed days—were brought into sharp relief last week when the annual meeting of representatives, adjourned from Southport,[1] was completed in London.

The association will evidently have a stiff fight in its campaign to gain more beds for general practitioners A North Country representative reported continuing displacement of practitioners from hospital posts, while a London spokesman said that in his area, though the work of hospitals could not be carried through without the continuing help of G P clinical assistants, their future was still in doubt At the meeting the most stringent criticism was reserved however, for the report on the G P's training[2] It was argued that the proposed three years postgraduate training would deter people from entering practice and might impose a heavy financial burden. Furthermore, if he did study for these extra years, the practitioner should gain an income more in keeping with the specialist s Dr J C Arthur declared that what the young doctor needed was not more training but more confidence to apply the knowledge he had already gained, and if he was to enter practice with this added confidence his teachers must undergo a change of heart More than one representative feared that the Cohen report s insistence on these further years might become the basis of action by the Ministry of Health Let us not ' as one put it, "give the Minister another chain to fetter us Sir Henry Cohen retorted that the best practitioners already put in the extra period of study and the report was concerned not with politics but with education His answer did nothing to still the prevalent disquiet Alive to the Minister s enhanced powers, representatives are loth to give grounds for action which might in the end prove unwelcome to many in the profession With firm rooting of this fear constructive endeavour might be brought almost to a halt

TRANSPOSING THE ULNAR NERVE

FROM a study of 46 cases treated at the Wingfield Morris Orthopædic Hospital McGowan[3] confirms the impression that in cases of traumatic ulnar neuritis and late ulnar palsy one can safely promise that anterior transposition of the nerve will prevent any further sensory or motor deterioration in the hand but one cannot guarantee any actual recovery In 21 of her patients the symptoms had developed years after a fracture near the elbow, in 10 they were associated with osteo arthritis of the joint (most of these patients were right handed labourers affected on the right side), and in 3 there was recurrent dislocation of the nerve In 2 patients there was congenital cubitus valgus and dislocation of the head of the radius in another 3 there was local scarring after soft tissue laceration, while in the remaining 7 no obvious primary abnormality could be found. When the clinical features of ulnar neuritis were slight at the time of operation—i e, when there was no detectable motor weakness and only mild sensory disturbance—there was rapid complete functional recovery In the intermediate group, with intrinsic wasting and weakness and some anæsthesia or analgesia in the hand, though

1 See *Lancet* July 22 1950 pp 139 148
2 *Ibid* 1950 1 1001 1008
3 McGowan A J *J Bone H Surg* 1950 32B 293

the hand became strong and useful and free from discomfort after the operation, slight residual weakness persisted in over half the cases and some sensory impairment in a quarter In the severe lesions with gross interosseous paralysis, full motor recovery was seldom obtained Nevertheless, the results fully justified operation, there was always some muscle improvement the function of the hand as a whole was much better, and sensation became more normal even when anæsthesia or analgesia had been conspicuous

Evidently the operation should not be delayed if adequate return of power is wished for, and even the most advanced cases can be confidently expected to gain considerably from operation It cannot be assumed that progressive deterioration is inevitable in the untreated case, for McGowan records that one patient, who refused operation, made a complete spontaneous recovery after 2½ years, but this is so unlikely that operation is always advisable As Brooks [4] says, there is no conservative treatment"

TREATMENT OF CEREBRAL PALSY

IN young people the relief of cerebral palsy depends mainly on re education For teacher and taught this is a heavy undertaking, but so far no other form of treatment has been of much help Sustained medication with the muscle relaxant, mephenesin ('Myanesin') has been tried by Frantz [5] Spasticity was relieved little if at all, but of 16 children with athetosis 14 were clearly benefited A surgical method of increasing cerebral circulation has been explored by McKhann and colleagues [6] in Cleveland In 125 cases they anastomosed the common or external carotid artery with the internal jugular vein, and they noted improvement in about 35% of children with cerebral palsy, mental retardation, or convulsive disorders, and in a small proportion of adults with cerebral vascular accidents and other complications of arteriosclerosis The procedure is reversible and seems to be relatively safe, but its initiators suggest that it deserves study as a new approach rather than as a satisfactory solution.

TOWARDS SAFER MILK

THE area eradication scheme, which began to operate at the beginning of this month, is designed to hasten reduction in the proportion of cattle infected with the tubercle bacillus, so that in fifteen years or so our dairy herds will include no reactors Immediate slaughter of all reactors is not feasible, because it would cause a disastrous fall in milk supplies and serious disturbance of farm economy, the cow plays an important part in maintaining soil fertility, and some replacement stock must be bred from the tuberculin positive [7] Instead, selected areas, beginning in October 1952, with two of the "cleanest"—in south west Scotland and in south west Wales—are to be declared eradication areas There reactors will be slaughtered and compensation paid, and movement of cattle into these areas will be controlled, meanwhile, testing of herds is being offered without charge In two further areas—the Scilly Isles and the Shetland Islands—all cattle are already attested Throughout the land only about 22% of all cattle are in attested herds

Reliable tuberculin testing will now be more than ever necessary, and there are indications that at present the results do not deserve implicit faith Disquiet has been caused because positive results are sometimes obtained in animals which belong to home-bred herds and which, on slaughter, show no signs of tuberculosis Misleading results may sometimes be due to a mild acid fast bacillary infection of the skin the pathology of which is uncertain. Obscure infection of this sort is apparently not confined to animals, for acid fast and alcohol fast bacilli, unidentifiable by ordinary methods, have been recovered from patients with urinary infection

As the eradication scheme develops, the effect on the incidence of pulmonary tuberculosis in man may prove unexpectedly striking, for studies in Scandinavia have shown that in rural areas as many as half the cases of phthisis may be due to the bovine organism [8]

4 Brooks D M *Ibid* p 291
5 Frantz C H *J Amer med Ass* 1950, **143** 424
6 McKhann C F Belnap W D Beck C S *Ann Surg* 1950 **132** 162
7 See *Lancet* 1949 ii 1089
8 See Francis J *Ibid* 1950 i 34

HOSPITALS AND THE PRESS

AT its annual conference in London last month the Institute of Journalists unanimously adopted a resolution deploring 'an increasing tendency for officialdom and 'red tape,' particularly in nationalised organisations, to impede the public services of the press", and almost every speaker spoke most harshly of the hospitals Mr V S Halton claimed that when these depended on the press for much of their income they always coöperated with newspapers, and it was possible at any time to go in and get the names of people involved in accidents 'Now, under nationalisation, there is no time for the press, and the normal avenues of information are closed' Mr S Wadlake agreed that the atmosphere previously cordial, had changed with the start of the National Health Service

Doctors are trained to shun personal publicity Moreover, they are constantly aware of their duty to preserve the confidential relation between themselves and their patients and they are sometimes in doubt of the use to which information they give will be put Hospitals, they rightly feel, exist to help and protect patients, whose misfortunes should not be regarded as 'news' On the other hand, sometimes they are clearly bound not to withhold the facts Thus the Minister of Health [1] has suggested that, when there is a big accident, the public is entitled to know its extent and—after the relatives have been notified—the names of the injured Otherwise, the Minister has wisely left hospitals to decide their own public relations policy Often, however, no policy exists, and the amount of information given depends on the doctor who receives the inquiry Hospitals might be wise therefore to invite local editors and their own staff to a meeting at which a policy could be worked out, and to appoint a public relations officer—perhaps the medical superintendent where there is one—to see that this is pursued. All will wish to preserve as much as possible of the local pride and local interest which newspapers can help to engender

MAKING THE MOST OF OUR CONGRESSES

THE Council for the Coördination of International Congresses of Medical Sciences, which is sponsored by W H O and UNESCO, have now completed their first year s work. With their comprehensive advance information and tactful synthesising powers, the council have been able to arrange for many related congresses to be held in the same town within a few days of each other Many workers have thus been able to make a fuller use of their visits abroad The council have also been able to help the organisers of related congresses to draw up programmes which did not cover the same ground, and to provide suitable background courses for those attending the congresses The council's *Bulletin* may be obtained from UNESCO House, 19, Avenue Kléber, Paris, XVI, and the April-July issue for this year contains a useful list of congresses which are to be held as far ahead as 1953

THE STATE AND MEDICINE

IN his inaugural address to King s College Hospital Medical School on Sept 28, Sir Lionel Whitby expressed his belief that as the cost of a serious illness is now beyond the purse of an ordinary person, all civilised nations will sooner or later be obliged to set up some form of subsidised medical service and experience seems to show that even a partial subsidy must be so large that in practice the scheme must be handled by the State In his view medical men should therefore not oppose a State service, for it is inevitable, but rather give their minds to ensuring that individualism, which has done so much for medicine in the past, is not extinguished by too much insistence on plans and planning

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Dr S ROODHOUSE GLOYNE pathologist to the London Chest Hospital from 1911 to 1948, died in London on Sept 25

THE INDEX and title page to Vol I, 1950, which was completed with THE LANCET of June 24, is published with our present issue A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street Adelphi, W C 2 Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now

1 See

Reviews of Books

British Encyclopædia of Medical Practice
(2nd ed) Editor Lord HORDER, F R C.P, consulting physician, St Bartholomew s Hospital London. London Butterworth 1950 Vols I and II Pp 719 711 £3 per volume

THE first edition of this work, in which diseases are considered alphabetically began to appear in 1936 and under the editorship of Sir Humphry Rolleston the end of the alphabet was reached at the start of the late war in 1939 In these four years the *Encyclopædia* gained a reputation for truly covering medical disorders from A to Z, and Lord Horder, who is now the general editor has wisely retained the same layout Nowadays those who contribute to or edit, such works as this often find to their chagrin that the information is partly outdated even before it is printed, but the collection from time to time of authoritative and comprehensive accounts provides a milestone by which to mark further progress and the popularity of this particular work reflects its daily usefulness to practitioners

Biological Actions of the Adenine Compounds
H N GREEN, M A, M.D, M.SC professor of pathology University of Sheffield H B STONER, M D B SC research assistant in the department London H K Lewis 1950 Pp 222 25s

Professor Green and Dr Stoner describe investigations undertaken to assess the significance of their original observation in 1943 that adenosine triphosphate (A T P) is responsible for nearly the whole of the 'shock' inducing effect of fresh skeletal muscle extract, when injected by routes other than the intravenous After reviewing the chemistry of the adenine nucleotides and the metabolism of A T P they describe in detail the effect of the purine derivatives on the cardiovascular and respiratory systems, the potentiating effect of magnesium ions, the relation between pulmonary embolism and the effect of A T.P, and the effect of certain therapeutic agents on A T.P shock. They conclude with a discussion of the possible rôle of nucleotides in various pathological states Their monograph is an impressive record of wide-ranging inquiries which (to quote Sir Edward Mellanby s foreword) should be of interest to biologists in general because it embraces most of our present knowledge of the effects produced by the presence of A T P and related compounds in extracellular sites. Though mainly an account of a particular series of experiments it surveys the relevant literature and is therefore a useful reference book

The Rheumatic Diseases
(3rd ed) G D KERSLEY, M.D Camb F.R C.P, physician with care of rheumatic diseases, Bristol Royal Hospital physician to the Royal National Hospital for Rheumatic Diseases Bath London Heinemann 1950 Pp 143 15s

THIS book now embraces the "new rheumatology", for, while it starts with conventional chapters introducing and classifying rheumatic conditions, it reaches endocrinology in the third chapter The first illustration is that of steroid formulæ and the second displays the action and uses of A C T H and 'Cortisone

A short chapter covers rheumatic fever The account of rheumatoid arthritis is well illustrated and up to date the value of various forms of treatment is discussed in a critical and constructive way, and though the use of cortical steroids is wisely omitted from the section on therapy the investigations now in progress are of course mentioned Specific infective arthritis is briefly but adequately described but osteoarthritis is dismissed surprisingly quickly Not all orthopædic surgeons would agree that where the hip is affected in ankylosing spondylitis, arthroplasty "is usually only temporarily satisfactory Gout is fully covered, and treatment including hydrotherapy is gone into in some detail Dr Kersley thinks that fibrositis does in fact exist in spite of its at present somewhat undefined pathology The mechanism of muscular pain and the various theories of its causation are described with copious reference to the literature It is somewhat surprising to see Bell s palsy included in the chapter on fibrositis and to find that the old fashioned wire splint extending from the ear to the corner of the mouth is still advocated. While sciatica receives a chapter of its own brachial neuritis gets only a paragraph in the one on fibrositis The last chapter covers special 'treatments, ranging from dietetics through hydrotherapy, X ray therapy, and physiotherapy to surgery While there is much good sense and a rational approach to all the methods included the subject cannot be satisfactorily presented in so small a space

Surgery of Repair
JOHN F PICK, S B, M M M D, F I C S clinical assistant professor of surgery, University of Illinois Philadelphia and London J B Lippincott 1949 Pp 828 £9 9s the set

THESE two volumes make a useful addition to the surgeon s library Perhaps rather too much (some 180 pages) of vol I is taken up with theoretical and philosophical considerations Next, the early treatment of a damaged part is considered, with due attention to repair of bones, blood-vessels, and nerves, and to early skin covering Then the varieties of skin transplantation are described not forgetting homografts in their restricted application tube pedicles and flaps are discussed in some detail The treatment of scars and burns is dealt with in a general way grafts of tissues other than skin are described, and a chapter on "surgical geometrics" is especially useful, though some of the diagrams must be interpreted with caution The second volume is regional, taking in turn the different parts of the body and the methods available for repair An extensive section covers mandibular injuries and deformities and there is a good section on the ear In fact few problems in reparative surgery escape mention As in most American books, the bibliography is enormous and the whole work is profusely illustrated

Letters to the Editor

TUBERCULIN SURVEYS

SIR,—In a recent tuberculin survey of a girls' grammar school in a London suburb conducted by one of us (A G H), the proportion of negative reactors was found to be 76%. The ages of the pupils ranged from 12 to 19 years and the level of tuberculinisation was remarkably uniform in each year—it was not significantly higher in the later age groups The flour paper jelly technique was employed, and possibly complete Mantoux testing up to 1 100, might have shown a slight increase in the proportion of positive reactors, but it would appear that between two thirds and three quarters of the girls have not as yet experienced their primary infection As it is probable that the majority of them will within the next few years be working or studying in the Metropolis, a significant proportion must shortly be exposed for the first time to direct attack by the tubercle bacillus In view of the fact that it is no longer seriously disputed that B C G vaccination confers a significant degree of protection against primary tuberculosis and its sequelæ, the question presents itself whether such groups of young people should any longer be left unprotected against random tuberculous infection

The argument against B C G vaccination in this country rests largely on the hypothesis that conditions here may differ from those in Scandinavia, and that experience there cannot be held to apply in Britain until proved by a series of pilot surveys conducted over a period of years Conditions it is true *are* different—there is a *greater* pool of infection in, for instance, London or Glasgow than in Oslo or Stockholm For the tuberculin-negative group therefore, the position is worse, the risk of infection is higher and the argument in favour of B C G vaccination correspondingly stronger, for does anyone seriously contend that if it is thought unsafe for young people to live and work in the Mantoux negative state in these two Scandinavian cities it can be anything otherwise in the conditions obtaining in most British cities?

It may be objected that in any event the majority of the inhabitants in really congested areas become Man

toux positive at an early age But does anyone know what proportion is negative in any area of any city in the country ? The truth is that we do not know at all accurately the level of tuberculinisation amongst our own population , and what we do know is far from reassuring It is clear, for instance, that there is a large influx of tuberculin negative individuals into our great cities year by year—the steady immigration from Ireland and rural Scotland into Glasgow comes particularly to mind to supplement the example of the " great wen " itself We know, too, that an increasing proportion even of those born and brought up in cities contrive to escape tuberculous infection till late adolescence, and that infection at this age is liable to have extremely serious consequences What we do not know is the extent of the problem, city by city, area by area, age group by age group Limited pilot surveys, including the one mentioned above, reveal only a small glimpse of a complex and varying situation, and the fact that some officially approved investigations are being conducted should not be allowed to obscure the necessity for large-scale surveys in *every* area We have now reached the stage where it should be incumbent on every health authority to ascertain the level of tuberculinisation of the population under its care There is no insuperable difficulty about this being done expeditiously in each major centre of population , in the survey quoted above the actual application of the tests on 495 girls was carried out in two hours by a team of six people (doctor, two nurses, two teachers, clerk) School leavers are the most obvious and probably the easiest group to start on , but clearly the factory population, the antenatal group, and others would require later investigation The opportunity, too, should be taken to Mantoux test all Army recruits , for that matter, there would appear to be no good reason why the negative reactors should be denied B C G since experience of the vaccine even in this country is sufficient at least to indicate its safety

We must, therefore, make a determined attempt to define the problem confronting us In so doing we shall gain much valuable information regarding the epidemiology and natural history of tuberculous infection When we know what proportion of our young people are at risk we shall be better able to estimate their danger and to consider the role of B C G in relation to existing facts There are now upwards of 43,000 pulmonary tuberculosis notifications per annum in this country, with no noticeable trend towards reduction A comprehensive effort on a national scale to reduce the figure is clearly indicated We cannot afford to pay mere lip service to prevention when there is available a possible preventive measure which is safe, scientific, capable of wide application, and even cheap In this connection the following report (not, be it noted, from Scandinavia) should give cause for reflection

> " A control program was inaugurated (in Japan) by the Supreme Command of the Allied Powers As a part of that program, approximately 31,000,000 persons had received B C G immunisation up to May, 1949 The control program has resulted in a reduction in the mean annual death rate from 280 per 100,000 population in 1945 to 181 1 in 1948 Analysis of the deaths by age groups indicates that the entire reduction has occurred in the age groups immunised with B C G The death rate in non immunised groups has not been appreciably reduced during this period Within the immunised groups the mortality has been reduced by 88% " [1]

In view of this and other evidence accumulating in different parts of the world, can there be any advantage in delaying further a major investigation into the level of tuberculinisation of our own population ?

A G HOUNSLOW
N MACDONALD
Clare Hall Hospital South Mimms Hertfordshire

1 Sams, C F J Amer med Ass 1949 141 527,

VITAMIN B_{12} IN PERNICIOUS ANÆMIA

SIR,—In your report (Sept 23) of the International Congress of Hæmatology I am quoted as saying that I now give " a minimum of 60μg [of vitamin B_{12}] weekly, increasing up to 200μg if there are neurological complications " The truth is that for *routine purposes*, now that cheap vitamin B_{12} concentrates are available, I usually give 60μg every *three* weeks, with more frequent and perhaps larger doses (*rarely more than 100μg a week*) for patients with subacute combined degeneration of the cord This does not mean that smaller amounts would necessarily be inadequate I have, in fact, some 40 or 50 patients who have been receiving much smaller maintenance doses—namely 10μg of vitamin B_{12} or B_{12c} every two weeks This is a special group in which the effects of vitamin B_{12} and vitamin B_{12c} are being compared , these patients have little or no neurological involvement and attend frequently so that the dose can be increased at once should the need arise Naturally one would not advise such low maintenance doses for routine use in patients not under close observation

Royal Victoria Infirmary Newcastle upon Tyne
C C UNGLEY

NO TOOLS

SIR,—Your leading article of Sept 23 has focused attention on the appalling inadequacies of some of the chest clinics in this country As you point out, comparison with well established and well staffed clinics only underlines these deficiencies The fact that some areas have been able to integrate a first class service is the result of satisfactory negotiations between chest physicians and their local boards Many of course have inherited well organised dispensaries but several efficient clinics have had to start pretty well from scratch since the inception of the National Health Service

It would appear that in many of the less satisfactory areas the lack of progress has been due, not to the absence of foresight or planning on the part of the chest physicians, but to the refusal of hospital and regional boards to allow more than token payments to the chest services It is surprising how many members of regional and hospital boards, both lay and medical, have an erroneous impression of the requirements and the work of an efficient chest clinic I feel that one of the best ways to get uniformity throughout the country would be for each regional board to appoint a tuberculosis subcommittee—many indeed have one already These committees could meet centrally and decide on the basic requirements and personnel

If the responsible authorities in backward areas will not take action to improve their services, they will eventually be forced to, by local agitation, with all the unpleasant publicity and recrimination that this would involve

M R C P

SIR,—The letter from "M D " and your leading article of Sept 23 are daggers turning in the hearts of those of us (and we are many) who lack the tools, and whose thoughts are bitter and angry at what has been for years the great betrayal—the betrayal of the tuberculous and of those who minister to them

Let it be noted that the Paddington and Kensington clinic was built by private enterprise, not by the municipalities it serves the blame for the inefficiency and inadequacy of tools and buildings (and oh, *what* buildings and *what* sanitation !) must lie squarely on the shoulders of medical officers of health, public health committees, and the Ministry of Health, who for thirty years or more turned a blind eye to the desperate needs of this specialty The new health service is in no wise to blame for the legacy it inherited—a monument to the

indifference, indolence, and parsimony of official medical and lay bureaucracies which spent money on this charge upon them on two counts only (1) pharisaically, to make clean the outside of the pot, (2) when "dispensary" buildings had become so decrepit that they were in danger of being condemned by the local sanitary inspectors

In some areas, however, staffs have succeeded in making bricks without straw In the Folkestone area, without adequate hospital facilities, but thanks to a helpful and loyal staff and coöperative colleagues in general practice, we have been able to maintain a service of operative or chemotherapeutic treatment or both, without recourse to sanatorium or pulmonary hospital beds for the past six years The results have amply repaid the heavy extra work involved

B G EDELSTON
Folkestone Chest Physician

SIR,—The readers of your leading article of Sept 23 might like to learn what can be accomplished where a regional hospital board has an adequate plan, and where a hospital management committee is prepared to coöperate wholeheartedly in putting this plan into operation

A little less than a year ago the East Anglian Regional Hospital Board accepted a report outlining a scheme for a comprehensive chest service for the whole region At that time in Ipswich and East Suffolk an area roughly forty miles square there was no chest clinic In one public health department two or sometimes three half-day sessions were held weekly at which old and new tuberculous patients were seen Radiological and pathological investigations could be arranged at a nearby general hospital For the rest of the area patients notified as suffering from tuberculosis were visited in their homes by the district medical officer of health

So much for things as they were During the past few months a brick built ward at the local isolation hospital has been adapted to serve as a central clinic It is equipped to undertake all normal outpatient investigations and radiological examinations Only patients requiring tomography have to visit one of three centres within a mile or two of the clinic Five subclinics housed in small hospitals or in premises provided by the local health authority have been established at the main centres of population in the area Each has an X ray machine adequate for standard radiography of the chest, and at some X ray screen examinations will be possible All but one of these subclinics will be in operation this month Each will be staffed from the main centre in Ipswich where there are one full time and one part time nurse one full time and one part-time radiographer a darkroom assistant and the necessary clerical staff There are as yet no full time tuberculosis health visitors but arrangements have been made so that the local health authority health visitor is able to attend the clinic session at which known tuberculous patients from her area attend

The physician has 80 hospital beds under his supervision The nearby sanatorium closed during the late war because of shortage of nursing staff is being opened as and when modernisation and staffing permit At the moment 60 beds are occupied, and it is hoped that there will eventually be 120 An almoner has been appointed to the "chest service She attends to the needs of all patients whether they be inpatients or outpatients

The local health authorities have at all times been very helpful and schemes are afoot to develop and extend the preventive and aftercare aspects of tuberculosis Regular contact examinations have been started and among the first 200 examined 8 new cases of active tuberculosis were discovered Although the main centre was opened only three months ago weekly attendance of patients now numbers 240 about one third of whom are referred for the first time for consultant opinion The waiting list of patients requiring sanatorium treatment is short, but this is due only to careful selection of patients and to undertaking where possible, treatment in the home Hostel accommodation for the ambulant and often homeless patient is urgently required, and if provided would free many hospital beds that are by comparison, expensive to maintain

Although we have had our "teething troubles," and "growing pains" obstruct the peaceful daily routine, one can look back upon the last ten months with a feeling of satisfaction and renewed confidence in our belief that tuberculosis can be banished within a generation

CHARLES J STEWART
Ipswich. Chest Physician.

PUERPERAL URÆMIA DUE TO ACUTE UPPER-NEPHRON NEPHROSIS

SIR,—In answer to Dr Govan and Dr MacGillivray (July 22 and Sept 23) may I point out that the pathological effects of acute renal failure are manifest in the kidneys within about 8 hours of the initial cause? Whatever the causal mechanism and whatever the explanation, the now well known findings merely indicate the varying degrees of degeneration and necrosis in the cortex and medulla Subsequent effects related to continued anoxia and superimposed overhydration will be apparent in those areas which have not succumbed to cortical necrosis but have not recovered, or are not recovering, by the 10th to 12th day These areas are, in Govan and MacGillivray's article, localised around some of the cortical glomeruli The title of their article suggests that these affected areas caused the uræmia Records of two of their three cases, however, indicate that on the day of death at least 1000 ml of urine was passed, despite continued vomiting previously, and suggest that in the 24 hours before death something in the nature of 170 litres of fluid had filtered through the renal glomeruli and that nearly this same amount had been reabsorbed by undamaged or recovered nephrons Thus it can hardly be maintained that all the proximal tubules were hydropic, but only those grossly affected by anoxia and unable to do the vital work of transferring the water back to the already diluted circulation

It is feasible that were serial sections of such kidneys examined, in addition to completely normal nephrons, all degrees of degeneration and regeneration would be found affecting all parts of many nephrons, although in the first instance the main brunt of the damage seems to be borne by the distal convoluted tubules and hence these are the first to show signs of recovery

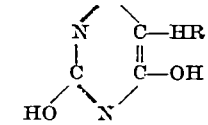
In conclusion, I never did consider that overhydration, by itself could produce lesions anywhere in the nephron, but, superimposed on anoxic and devitalised cells—whether they be in the liver, brain, or kidney—overhydration will surely lead to hydropic degeneration As regards Govan and MacGillivray's suggestion that the distal parts of the nephron are responsible for water and salt exchange, I would point out that, in mammals at any rate,[1] 80% of the water in the glomerular filtrate is reabsorbed in the proximal tubules, together with a proportion of the chloride

D W BRACEY
Peterborough

THEORY OF BARBITURATE ACTION

SIR,—Velazquez and Elio[2] have advanced a general theory of narcotic action, which they suggest is due to the inhibition of acetylcholine synthesis For the action of barbiturates the following explanation is proposed

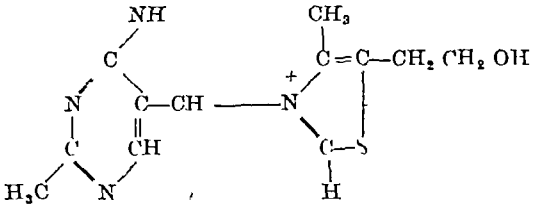
Barbituric acid consists essentially of a pyrimidine ring



This has little if any narcotic action, but suitable substitution of the H atom at the position R will confer

1 Wright S Applied Physiology London 1945
2 Velazquez L Elio, F J, *Brit chem Abstr*, 1945, A III 636,

this property The pyrimidine ring also occurs in the pyrimidine moiety of thiamine



Thiamine plays an essential part in the synthesis of acetylcholine indeed it is actually produced with acetylcholine at the cut end of a peripheral nerve, more especially during stimulation of the nerve [3]

By an extension of the Woods and Fildes theory of the action of sulphonamides by "selective inhibition," it seems likely that if a sufficient concentration of barbiturate should be present in the blood stream, the barbiturate would combine with certain constituents of the nerve cells and thus render them less capable of utilising thiamine in the synthesis of acetylcholine [4] As a result of the comparative lack of acetylcholine, the general activity of the brain would be depressed This would explain its action in the case, for example, of epilepsy

My thanks are due to Prof W E Jessop and Prof W R Fearon for their advice and encouragement

Dublin H W DALTON

INTRATHECAL TUBERCULIN

SIR,—Another possible explanation of the recovery of patients with tuberculous meningitis treated with intrathecal tuberculin (Dr Smith and Dr Vollum, Aug 19) is that the local tissue reaction to tuberculin in these sensitised subjects released sufficient fibrinokinase to activate enough plasminogen to lyse the fibrin which was causing subarachnoid block Ungar and Mist [5] reported that formation of fibrinolysin from its inactive precursor could be brought about by adding specific antigen to the serum of sensitised guineapigs Dr Jackson (Sept 16), in drawing attention to the meningeal irritation that may be caused both by streptomycin and by tuberculin, does not explain the dramatic recoveries of patients already showing hydrocephalus

CHARLES H LACK

Institute of Orthopædics London W 1

THREAT TO A SMALL GENERAL HOSPITAL

SIR,—Mr Howkins in his letter of July 15 is quite right The threat to the integrity of St John's Hospital, Lewisham, is not an isolated example

In one hospital with which I am acquainted, it was rumoured that the obstetrical department would be moved from the main hospital to another building altogether This dismemberment of general hospitals, thus robbing them of the benefits of specialised departments, can only be a retrograde step, as Mr Howkins says Whilst, on the surface, it would appear that the isolation of specialised departments in separate self contained hospitals is good planning, it encourages over specialisation In the long run, this can only be detrimental to the patient, for it is the disease rather than the patient which becomes the object of treatment

It is to be hoped that this dismemberment of general hospitals will not be proceeded with, for they are *undoubtedly* the mainstay of the hospital service

London W 1 H H FOURACRE BARNS

1 von Muralt A *Nature Lond* 1943 152, 188
2 Trethowie E R *Aust J exp Biol med Sci* 1942 20 9
3 Ungar, G, Mist, S *J exp Med* 1949 90, 39

In England Now

I WAS *trying to compose a lucid letter to Sir Stafford* Cripps the other day, when I chanced to look out of the window and saw a cat sitting on the lawn next door He was obviously enjoying the sunshine and conducting a leisurely and dignified ablution, as behoves the sire of most of the kittens in this district It is part of his routine to sit there each day (weather permitting) waiting for a rather boisterous and very exhausting Dalmatian puppy to be taken for a walk after tea When the pup's unsophisticated yelps have vanished into the distance, the cat strolls indoors, inspects his saucer, and then settles down in our armchair to ruminate on mice and men before starting the serious part of his day's work For about supper time (again weather permitting) he sets out to do a little procreating, and if it is a warm night he may not return to our chair till dawn

When the weather is fine, he spends his mornings and afternoons wandering round the neighbourhood sharpens his claws on an old apple tree in the rector's garden, and takes a quiet snooze on a heap of grass cuttings If he feels energetic he may stalk a few birds, he seldom catches any, but that does not matter, for the sport amuses him and there is always something in his saucer, if he feels a bit peckish

When the weather is not all that he feels it ought to be, he stays indoors There is usually a fire to sit by, or a radiator, and if the worst comes to the worst he can always lie down by the kitchen stove When, as *a result of this lack of exercise, his appetite* wanes, the women of the house try to tempt him with cream and sardines or perhaps a morsel of chicken

Though he is out a good deal, the cat has our chair to himself much more often than I do, and it is seldom that we share it I have nearly 1000 cards in the filing *cabinet in my surgery*, and he reaps the benefit He is the clever one, I am the mutt

* * *

She was imaginative and polysymptomatic, and she complained a great deal of "fluttering and dancing" in the rectum Diligent search failed to reveal any evidence of such terpsichorean activities, and the stools were reported as containing a normal flora "It seems evident," *wrote our psychiatrist*, who finally got landed with her, "that there are fairies in the garden of her bottom"

* * *

While I was visiting the butcher, his wife bade one of her sharp Cockney sons go out to the chicken house in the field behind the shop and pick up the eggs The boy grumbled, as boys will "I don't wanna go," he muttered "I'm afraid of the cows and the nettles sting me legs" "*Go on with you*," said his mother, and, always prepared to support parental authority, I added, "What sort of a man do you hope to be, Derek, if you're afraid of cows and nettles?" "A sailor," he replied He had me there

* * *

"Woman," wrote a Peripatetic recently, "is so practical but man, man is inspired" And how right he is! Take bed making, for instance For how long do you suppose, have women made beds in the conventional manner, from below upwards? Anyone who has done it single handed will know that this involves perambulating around the bed several times, at any rate when dealing with the bilocular, or double bed, variety Bed-making husbands, whose wives have taken the kids off to the seaside, should therefore note the following method On rising in the morning the bedclothes are reflected medially instead of caudally, as is customary After the bath and breakfast, the bed is closed in layers from within outwards, first down one lateral border and then, exerting traction, down the other the inferior margin is dealt with *on the return journey* Thus a minimum of peregrination is required For less particular bachelors, I have even simpler advice if the bed is left unmade until one returns home in the evening—well there doesn't really seem to be much point in making it at all

News

The awards committee under the chairmanship of Lord Moran have now selected about 1500 specialists who are to receive distinction awards Their names will not be published Most of the awards of £2500 and £1500 have now been decided but 400–500 further awards mostly of £500 will be made shortly Those to dental consultants have still to be considered

At the 21st anniversary dinner of the Royal College of Obstetricians and Gynæcologists held on Sept 29 Prof Hilda Lloyd the president announced that Sir Arthur Sims has endowed a Commonwealth travelling professorship and the Bernhard Baron Fund has given £10 000 for a travelling scholarship These donations brought the appeal fund within sight of £100 000 and Professor Lloyd reminded her listeners that its other aims were to provide a larger home for the college preferably on a common site with the other Royal Colleges and to provide facilities for research Sir John Anderson proposed The College and Mr C F Gibberd The Guests Responding for the latter Dr Russell Brain P R C I suggested that their only common claim to the hospitality of the college was that they had all been born They were grateful for the college s postnatal interest in them and for what he might call this follow up investigation

Notifications of poliomyelitis in England and Wales during the week ended Sept 23 were paralytic 268 (291) non paralytic 151 (187) total 419 (478) The figures for the previous week are in parentheses For the second successive week there has been a decided fall in notifications Uncorrected notifications for this year now total 6023 The corresponding figures for 1947 1948 and 1949 were 6192 1361 and 3281

On Friday Oct. 13 at 5 P.M Dr Philip Hench of the Mayo Clinic will lecture at the University of Edinburgh on the Present Status of Cortisone and A C T H in General Medicine

On Monday Oct 16 at 4 P M at the Royal Faculty of Physicians and Surgeons of Glasgow he will give the first Walker lecture on the Effect of Cortisone and A C T H on Rheumatic Diseases

The Secretary of State for Scotland has thanked the doctors and the nursing staff at Ballochmyle Hospital for their work at the New Cumnock disaster Nearly 100 patients were accommodated at the hospital The whole of the medical staff was placed on a rota and two medical officers were stationed at the pithead on 6 hour shifts throughout the 24 hours

The attendance at the Middlesex Hospital Medical School dinner on Sept 28 was larger than ever Mr E W Riches in the chair paid tribute to Middlesex men who had died during the year and spoke of honours distinctions and appointments Two women students had now qualified the *Archives of the Middlesex Hospital* was reviving next January and if present plans were realised our grandchildren or great-grandchildren will find a more commodious hospital ' Sir Harold Boldero the dean whom Mr Riches had described as the mainstay of our medical school in war and peace said that the year had been satisfactorily uneventful despite the choreiform state of external affairs Dr R W Gilliatt, whose father Sir William Gilliatt had preceded him as Broderip scholar in 1908 recalled how the ex Servicemen now qualifying had merged in Middlesex their various experience in midget submarines in the air and in the desert under predominantly Naval influence Sister s bunk had become her cabin and the lateral lobes of the thyroid were known as port and starboard Mr D H Patey proposed the chairman s health in a most spirited manner and it was drunk in the same

ACADEMICAL AND EDUCATIONAL

University College London Free public lectures (physiology of vision chemical transmitters protein structure) Details (stamped envelope) from Asst Secretary Gower street W C 1

Conjoint Board in England Examinations start for D A Nov 10 D T M & H Nov 15 D L O Nov 30 D I H Dec 1 D.P M Dec 8

Institute of Orthopædics Course in diagnostic and prognostic methods in orthopædics Nov 6–11 Fee 7 gns Apply Dean 234 Great Portland street W 1

Tuberculosis Educational Institute 3 day clinical courses Aintree Liverpool (starts Oct 25) Godalming Surrey (Oct 17 and Nov 21) Market Drayton Salop (Nov 8 Dec 13) Fees 3 gns Apply Secretary Tavistock House North W C 1

Leeds University Full time Lecturer in Preventive Medicine and Public Health Salary £900–£1350 Apply to Registrar by Oct 21

Liverpool University Chair of Pharmacology Apply to Registrar by Nov 18

Auckland University College N Z Chair of Obstetrics and Gynæcology Salary £N Z 2700 Apply to Secretary Assoc of Universities of the British Commonwealth 5 Cordon square W C 1 by Dec 15

Charing Cross Hosp Med Sch Demonstrator in Physiology Salary £600–£750 Apply to Secretary

Institute of Cardiology First Assistant Salary £1250–£1450 or £900–£1100 Apply to Dean

LIST OF HOSPITAL VACANCIES

Central Middlesex N W 10 —Reg Ames
Eastern E 9 —R H O Jr Reg
Evelina S E 1 —H S
Fulham W 6 —H.S (Spec Depts)
German E 8 —H S
Greenwich & Deptford H M C —Sr Reg (orth surg)
Guy s S E 1 —Reg (ophth) Reg (surg thor) Sr Reg (surg thor) Reg (phys med)
Hackney E 9 —H S (E N T)
King Edward Mem & Perivale Maty —Obst & Gyn
London Jewish E 1 —H S (H O)
London Chest E 2 —2 R H P s R.S O (Jr Reg or Reg)
London Jewish E 1 —H P
Miller Gen S E 10 —M O (cas)
Mothers (Salvation Army) E 5 —Obst R M O (H O 1st post)
Middlesex, W 1 —Reg or Jr Reg (rad)
Metropolitan E.8 —H O (med) 2 H O s (surg) Jr Reg (cas)
Neasden N W 10 —R M O (Reg)
Paddington W 9 —R H P Cas O (Jr Reg)
Queen Elizabeth E 2 —H O s
Royal Free W C 1 —1st Asst (Sr Reg) Sr Surg Reg H S (orth) Cas O Ames Dep M O & H P Sr Med Reg
Royal National Throat Nose & Ear W C 1 —R H.S
Royal National Orthopædic W 1 —R H S
Royal Northern N 7 —Rad
St Alfege s S E 10 —Sr H.S
St Ann s Gen —H P (Inf dis)
St George s S W 1 —2 Surg 1st Assts (Sr. Reg or Reg) 1 thor surg
St Thomas s S E 1 —P t Phys (cardiac)
St Mary's W 2 —Med Reg
South London Women & Child S W 4 —R M.O (Jr Reg)
St Paul s W C 2 —Sr Reg
St Stephen s, S W 10 —Med Reg (rheum) Med Reg (med)
Springfield S W 17 —Asst Psych (Sr H M.O)
Tavistock Clinic W 1 —Psych
University W C 1 —Sr Reg (ophth) Asst Reg (E N T)
Westminster S W 1 —Asst Phys (Cons) skin

Provincial

Aylesbury Royal Bucks —H.S (E N T & ophth)
Aberdeen Gen —Reg (gen med) Reg or Jr Reg
Ashford Kent Willesborough —H P (med & O P)
Ashton Hyde & Glossop H M.C —H S (orth) Reg (chest & T B)
Ashton u Lyne Dist Infy —2 H S s R.S O (Jr Reg)
Altrincham Gen —Asst. R S O
Aberystwyth Gen —Jr H M.O
Ashford Middx —R H S (Male) gen surg
Bath St Martin s —H S (gyn & obst) H S
Barnsley St Helen —Obst H S
Barnet Gen —Res Obst Gyn H S R H O
Billericay St Andrew s —Obst Reg
Billericay St Andrew's —H S (gen surg & orth)
Birmingham Marston Green Maty —R.S O (Reg)
Birmingham 18 Dudley Road —Surg H O Jr Reg (E N T) Surg H O (ear throat & cas)
Birmingham 18 Dudley Road —H S (E N T)
Birmingham 9 Little Bromwich —Jr R M O
Birmingham Royal Orth —Locum Jr H M O (orth)
Barrow in Furness North Lonsdale —R H S
Bowdon St Anne s E N T —Jr E N T Reg
Bradford St Luke s —H.S (gyn)
Braintree Black Notley —Orth H O
Bristol Cossham/Frenchay H M C —H S (neurosurg)
Bury St Edmund s West Suffolk Gen —H S (cas & orth) H S (gyn & obst)
Bury Gen —Cas O H S
Bromsgrove All Saints —2 H S s H I
Burton-on Trent Gen Infy —H S
Birmingham R H B —Psych & Dep Med Sup Asst Rad (Sr H M.O s)
Bristol Stapleton —R M O (Jr H M O)
Bishop Auckland Gen —H P
Bournemouth Royal Victoria —H.S (ophth & E N T)
Burley in Wharfedale Scalebor Park Mental —2 Jr Reg
Brighton 7 Royal Sussex County —H P
Brighton & Lewes H M.C —2nd R H.S (E N T)
Barnstaple North Devon Infy —Res Cas O
Carshalton St Helier —Reg (med)
Cottingham Castle Hill & Sanatorium —H O s
Chesterfield & North Derbyshire Royal —H O (cas)
Cardiff H.M.C —H O
Carmarthen West Wales Gen —H S R.S O

Canterbury Kent & Canterbury—E.N T & Eye H S
Cheltenham Gen Eye & Childs—R M O (childs) H S
Chelmsford & Essex & St John s—H S (Spec Depts)
Chelmsford & Essex—H P
Colchester Essex County—H P 2 H S s
Chester City Hosp & Royal Infy—Med Reg (gen med & cardiac)
Cheltenham Sunnyside Maty—R Obst O
Chelmsford St John's—H P
Cheddleton Staffs St Edwards—Psych Jr Reg or H P
Cardiff The United Cardiff—Inter Reg (child hlth) Sr Neurosurg Reg
Durham County—Reg (surg)
Driffield Yorks East Riding Gen—H.P
Davyhulme Park—Med Reg Surg (E N T) Med & Paed H O s
Darlington Mem—E N T Reg Cas O
Dewsbury Staincliffe Gen—Jr Reg (surg) H P (derm) H P (with paed) H O (obst. & gyn), H O (gen surg)
Dewsbury & Dist Gen Infy—H S
Dundee Dist & Royal Mental—Res Jr H M O
Doncaster Royal Infy—Jr Reg (Cas O) H S
Doncaster H M C—Jr Reg (chest clin)
Edgware Gen—R H P
East Anglia R H B Norwich—Cons E N T Surg
East Anglia R H B Peterborough—Cons Path
East Anglia R H B, St Audry's Mental—Sr Reg (psych)
East Anglia R H B Papworth—Sr Surg Reg (thor surg)
East Anglia R H B, East Suffolk & Ipswich—Anæs Reg
East Anglia R H B Stamford & Rutland—Surg Reg
Farnham—Asst Surg O (H O)
Guildford St Lukes—H O (obst)
Griffithstown Mon County—Jr H.M O (obst & gyn)
Griffithstown Mon County—Jr H.M O (orth)
Grantham & Kesteven Gen—H O (surg)
Guildford Royal Surrey County—H P
Gateshead Sheriff Hill I D—H O (phys)
Great Barrow Barrowmore—R.M O (Male)
Glasgow Western R H B—Ophth (Sr H.M O), Anæs (Sr H.M.O)
Hereford Burghill & Holme Lacy—Res Jr Reg or Locum
Horsham Sussex Roffey Park Rehab Centre—Sr H M O
Hillingdon Middx—H S (gen surg & genito urinary)
Halifax. Royal Infy—Jr Reg (cas & orth) 1st H S
Halifax Gen—H S
Halifax Area H.M C—H P
Haverfordwest Pembroke County War Mem—R S O H S
Huddersfield Royal Infy—Jr Reg (cas) Jr E N T Reg Rad Reg
Hull A Group H M C—E N T H.S
Hull Royal Infy—Orth H S H P
Hull Victoria Sick Child—H.S s H P
Kidderminster & Dist. Gen—H P H.S
Leamington Spa Warneford Gen—R H S
Leeds Public Dispensary—Sr Cas O (Jr Reg)
Lincoln Bracebridge Heath—Jr H M O
Lincoln Burton Road—R M O (Jr H.M O)
Leeds 9 St James s Hospital—Reg (psych) Jr Reg (orth)
Lowestoft & North Suffolk—H S
Leeds Gen Infy—Reg or Sr Reg (orth)
Leeds United Leeds & Leeds R H B—Sr Reg (anæs)
Liverpool 14 Broadgreen—2 H O s (thor)
Mansfield Notts Harlow Wood Orth—R H S
Manchester R H B, Whittingham & Park side—2 Asst. Psychs
Manchester St Mary s—Obst H S.s Gyn H S s
Manchester 19 Duchess of York Babies—H P
Mansfield & Dist Gen—Sr H S (acc & orth)
Newport Mon Royal Gwent—H O (E N T & ophth), H O (derm & V D), H O (orth)
Nottingham Gen—Res Orth Reg (acc & orth), Aural H S Jr Aural Reg
Nottingham City—Obst H.S, Res Path (Jr Reg)
Northampton Gen—Cas O
Norwich Norfolk & Norwich—Sr Cas O (Jr Reg)
Newcastle Royal Victoria Infy—Jr Reg (anæs)
Newcastle Gen—H P
Oxford R H B, Aylesbury & High Wycombe—Anæs
Portsmouth St James—2 Asst. Psychs (Sr H M O)
Peterborough Mem—Cas & Orth H S
Penrhiewtyn Neath Gen—R S O (orth) H S s H P Surg Reg
Portsmouth Royal Portsmouth—H P
Portsmouth St Mary s—H.P
Preston Royal Infy—Orth H S
Plymouth South Devon & East Cornwall—H S (Jr Reg) cas & frac H S (obst & gyn) H S s H O (anæs)
Pontefract Gen Infy & Hydes—R S O (Jr Reg) H P H S
Rochdale Infy—Cas H S
Redruth Camborne Redruth Miners' & Gen—H S
Romford Oldchurch—R H O (neuro surg)
Rochdale & Dist. H.M C—Jr Reg (chest dis)
Ryde Royal I W County—H S H P
Skipton The Hospital—H O
Swansea—Res Cas O Res Anæs
Stannington St Mary s Mental—Reg (psych)
Skipton Gen—H S
Scunthorpe & Dist. War Mem—Res Orth H O
Scarborough—R H S (surg)
Shrewsbury Eye Ear & Throat—E N T H S
South Mimms Herts Clare Hall—Jr Reg
Shoreham by Sea Southlands—R H S
Southampton Borough Gen—H S (orth & gen surg) H S (gyn & obst) H S
Stamford & Rutland—Cas O & H P, R H S
Swindon & Dist H M C—R H S (gen surg)
Stannington Northumb St Mary s—Sr Reg
Stoke-on Trent N Staffs Royal Infy—H O (anæs) H O (orth)
Stoke-on Trent Bucknall Isolation—H O (med)
Stoke-on Trent. Longton—H O (surg)
Shrewsbury Royal Salop Infy—Orth. H.S /Cas O
Scunthorpe & Dist. War Mem—R H O (E N T & rad)
Scotland North Eastern R H B—Diag Rad (Cons)
Sheffield No 1 H M C—Jr Med Reg
St Albans Napsbury Mental—Locum Tenens Jr Reg
Sutton Surrey Banstead—Reg
Salisbury Gen—Res Jr Reg (E N T)
Southport Gen Infy—Jr Reg (anæs.)
Southend on Sea Gen—Res Cas O (Jr Reg)
S W Met R H B St. Helier—Sr Surg Reg Reg (Rad)
S W Met R H B, Sutton & Cheam—Reg (surg)
Swindon & Dist H.M C—Res. Cas O (Cent Cas Dept)
Scotland Rosslynlee Mental—H O
S W Met R H B Chichester—Cons Anæs
Tilbury & Riverside Gen—H.P (Tilbury)
Tilbury & Riverside Gen—H S (gen surg & orth) Orsett.
Truro Royal Cornwall Infy—H.S
Tredegar Gen—H S
Taplow, Berks Canadian Red Cross Mem—Jr Reg (jnr rheum)
Warwick Central Mental—Jr Reg
Wakefield Oulton Hall M D Inst—Reg (psych)
West Bromwich & Dist Gen—Res Anæs & H S
Woking Victoria—R.M O (1st post)
Wrexham Trevalyn Manor Maty—Obst. H S
Wrexham Maelor Gen—H P
Welsh R H B—Anæs (Sr H M O), Mid Glamorgan Jr H.M O (chest dis & T B) Rhymney & Sirhowy Valleys
Wakefield Yorks Pinderfields Gen—H P (thor)
Whiston County—Cas & Admission O
Yorkshire Keighley & Dist Victoria—H S
York County—2 R H S s
York City—R H S
Otago N Z—Sr Asst 3 Asststs
Australia Royal Melbourne—Path

PUBLIC HEALTH

Bucks County Council—A C M O
Bootle County Borough—A.M O H & A S M.O
Government of Iraq—Profs Anat. Rad, & Pharm Lecturer (chem)
H.M Colonial Service, Malaya—M.O s & Health O.s
Inverness County Council—Asst. M O & Asst School M O
Lancashire County Council—Asst. Div M O s
Retford Notts—Locum Tenens
Southern Rhodesia Government—Schools M O (Male)

HOSPITAL NON MEDICAL VACANCY

Birmingham United Birmingham—Sr Hosp Physicist. (rad)

Notices of vacancies will appear in this form (without charge) until normal publication can be resumed

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WE must again express our regret at being unable to present various articles that need early publication Not least in medical science, the blockage of normal channels of information can soon do real damage Hence we welcome the greater sense of urgency lately shown by those charged with finding a solution of the present printing dispute

Electrophrenic Respiration

A VAST public is still fascinated by the ingenious "iron lung" devised in 1929 by DRINKER and SHAW[1] for "prolonged administration of artificial respiration" This apparatus is alternately the hope and the despair of the clinician called on to treat bulbar or bulbospinal poliomyelitis with respiratory failure He can rarely prophesy whether the treatment will be (1) a brilliant success, tiding the patient over a difficult period until use of the respiratory muscles is restored to him (2) a comparative failure with a hopelessly paralysed patient depending on the respirator for continued existence or (3) a complete failure, giving little or no relief because of an obstructed airway or concomitant paralysis of the respiratory centre Many of these cases are complicated by pharyngeal or laryngeal paralysis, and the consequent pooling of mucus leads to obstruction of the respiratory passages Under these conditions the violent inspirations induced by the respirator give rise to a negative pressure in the bronchioles and alveoli, into which plasma and red cells are sucked, producing hæmorrhagic pulmonary œdema. To ward off this danger respirator treatment may be combined with postural drainage and suction, but this is not always effective, and of late years tracheotomy has often been employed as an additional measure, especially in the U S A, where experience of this type of poliomyelitis is vastly greater than elsewhere

None of these methods suffices, however, when the patient begins to exhibit the grossly irregular "respiratory fibrillation" characteristic of severe damage to the respiratory centre. Here the spontaneous rhythm does not often conform with that of the respirator, and death usually follows fairly rapidly Sometimes it is true, if the negative pressure of the respirator is increased to 30 cm water the patient may be induced to cease all respiratory effort, but this step is taken at the risk of inducing alkalosis A new and apparently effective method of meeting this difficulty is now described by a Boston team under the leadership of SARNOFF[2] It has been shown in animals and man that electrical stimulation of one or both phrenic nerves will suppress spontaneous respiration and induce artificial respiration, and such stimulation, applied externally through an electrode over the motor point of the phrenic nerve, can be used to induce smooth, regular, rhythmic respiration, provided that at least one lobe of the diaphragm is working Patients with irregular, shallow, spontaneous respiration who failed to adapt their breathing to the respirator s rhythm have been submitted to this stimulation for periods varying from eight hours to several days It seems that, even after a few hours, spontaneous respiration may be greatly improved, but in the worst cases stimulation may have to be continued for some time before the respiratory centre has sufficiently recovered In one case the immediate effect was a change from ineffective shallow, irregular respiration to Cheyne-Stokes respiration, which proved to be an intermediate stage on the way to full recovery of the respiratory centre SARNOFF and his colleagues describe 9 cases in which this method was applied apparently with conspicuous success Most of them were grossly dyspnœic, and the patients might otherwise have been expected to die More experience will be needed before the value of this device can be established The apparatus should not be used unless the operator has made himself proficient with it, and to become proficient he must practise on normal volunteers

It is becoming evident that the somewhat haphazard methods by which we have tried to deal with these desperate cases are becoming obsolete If poliomyelitis persists in this country on a serious scale, we shall have to build up specialised and well-equipped teams of doctors and nurses to deal with threatened or actual respiratory failure

1 Drinker P Shaw L A. J clin Invest 1929 7 229
2 Sarnoff S. J., Maloney J V jun Sarnoff L. C., Ferris B G Whittenberger J L J Amer med Ass. 1950 143 1383

Annotations

SAFEGUARDING THE DOCTOR

THE latest report from the Medical Protection Society[1] describes many interesting cases but as Sir Ernest Rock Carling said in his presidential address at the annual meeting last week, the society s most important work lies in dealing daily with requests for advice it offers a preventive as well as a curative service Under the N.H.S doctors are more than ever in need of such protection for the Ministry of Health, as might be expected, assumes no responsibilities that can legally be placed on the clinician. Among other points Sir Ernest made the following (1) To make sure that swabs are not left in the body every operating theatre *must* have a discipline what the particular practice is does not matter so much as its regular observance (2) Dental packs to prevent the swallowing of teeth should be large and preferably should have a tape attached. (3) When part of a needle remains in the tissues the doctor should not admit liability but should send the fragments (both if possible) to the society for metallurgical examination later if necessary (4) Every hospital should have written rules making it clear on whom responsibility rests for giving antitetanus serum and newcomers to the hospital should ask what the rules are (5) All doctors should take out a policy with an insurance company covering mishaps (such as falls) on their premises Sir Ernest also referred to the vexed question of responsibility for work done by a registrar or other junior doctor at the request of a senior when something goes amiss it is he feels, a little hard that the onus should lie entirely on the man working under instruction.

Mr W M Mollison, the treasurer, reported that the amount spent per member last year was £1 4s 7d of which 14s 2d went in legal expenses and indemnities The deficit of £2195 was covered however by an increase in the value of capital funds from about £112 000 to nearly £119 000 and the subscription to the society remains at £1[illegible]

CANCER OF THE MOUTH

DESPITE new methods of treatment the prospects of the patient with cancer of the mouth are not impressively better than they were half a century ago Two of the reasons are made clear in an account of 800 cases observed by Ledlie and Harmer[2] at the Royal Cancer Hospital London In the first place the patients were mostly well up in years, so that the natural expectation of life was short Of the whole series,

1 From the offices of the Society Victory House Leicester Square London W C 2
2 Ledlie E M., Harmer M H Brit J Cancer 1950 4 6

Canterbury Kent & Canterbury —E N T & Eye H S
Cheltenham Gen Eye & Childs —R M O (childs) H S
Chelmsford & Essex & St John s —H S (Spec Depts)
Chelmsford & Essex —H P
Colchester Essex County —H P 2 H S s
Chester City Hosp & Royal Infy —Med Reg (gen med & cardiac)
Cheltenham Sunnyside Maty —R Obst O
Chelmsford St John's —H P
Cheddleton Staffs St Edwards —Psych Jr Reg or H P
Cardiff The United Cardiff —Inter Reg (child hlth) Sr Neurosurg Reg
Durham County —Reg (surg)
Driffield Yorks East Riding Gen —H P
Davyhulme Park —Med Reg Surg (E N T), Med & Paed H O s
Darlington Mem —F N T Reg Cas O
Dewsbury Staincliffe Gen —Jr Reg (surg) H P (derm) H P (with paed) H O (obst & gyn) H O (gen surg)
Dewsbury & Dist Gen Infy —H S
Dundee Dist & Royal Mental —Res Jr H M O
Doncaster Royal Infy —Jr Reg (Cas O) H S
Doncaster H M C —Jr Reg (chest clin)
Edgware Gen —R H P
East Anglia R H B Norwich —Cons E N T Surg
East Anglia R H B Peterborough —Cons Path
East Anglia R H B St Audry's Mental —Sr Reg (psych)
East Anglia R H B Papworth —Sr Surg Reg (thor surg)
East Anglia R H B, East Suffolk & Ipswich —Anes Reg
East Anglia R H B Stamford & Rutland —Surg Reg
Farnham —Asst Surg O (H O)
Guildford St Lukes —H O (obst)
Griffithstown Mon County —Jr H M O (obst & gyn)
Griffithstown Mon County —Jr H M O (orth)
Grantham & Kesteven Gen —H O (surg)
Guildford Royal Surrey County —H P
Gateshead Sheriff Hill I D —H O (phys)
Great Barrow Barrowmore —R M O (Male)
Glasgow Western R H B —Ophth (Sr H M O), Anes (Sr H M O)
Hereford Burghill & Holme Lacy —Res Jr Reg or Locum
Horsham, Sussex Roffey Park Rehab Centre —Sr H M O
Hillingdon, Middx —H S (gen surg & genito urinary)
Halifax Royal Infy —Jr Reg (cas & orth) 1st H S
Halifax Gen —H S
Halifax Area H M C —H P
Haverfordwest Pembroke County War Mem —R S O H S
Huddersfield Royal Infy —Jr Reg (cas), Jr E N T Reg Rad Reg
Hull A Group H M C —E N T H S
Hull Royal Infy —Orth H S H P
Hull Victoria Sick Child —H S s H P
Kidderminster & Dist Gen —H P H S
Leamington Spa Warneford Gen —R H S
Leeds Public Dispensary —Sr Cas O (Jr Reg)
Lincoln Bracebridge Heath —Jr H M O
Lincoln Burton Road —R M O (Jr H.M O)
Leeds 9 St James s Hospital —Reg (psych), Jr Reg (orth)
Lowestoft & North Suffolk —H S
Leeds Gen Infy —Reg or Sr Reg (orth)
Leeds United Leeds & Leeds R H B —Sr Reg (anes)
Liverpool 14 Broadgreen —2 H O s (thor)
Mansfield Notts Harlow Wood Orth —R H S
Manchester R H B Whittingham & Park side —2 Asst Psychs
Manchester St Mary s —Obst H S s Gyn H S s
Manchester 19 Duchess of York Babies —H P
Mansfield & Dist Gen —Sr H S (acc & orth)
Newport, Mon Royal Gwent —H O (E N T & ophth), H O (derm & V D), H O (orth)
Nottingham Gen —Res Orth Reg (acc & orth), Aural H S Jr Aural Reg
Nottingham City —Obst H S, Res Path (Jr Reg)
Northampton Gen —Cas O
Norwich Norfolk & Norwich —Sr Cas O (Jr Reg)
Newcastle Royal Victoria Infy —Jr Reg (anes)
Newcastle Gen —H P
Oxford R H B Aylesbury & High Wycombe —Anes
Portsmouth St James —2 Asst Psychs (Sr H M O)
Peterborough Mem —Cas & Orth H S
Pontypridd Neath Gen —R S O (orth) H S s H P Surg Reg
Portsmouth Royal Portsmouth —H P
Portsmouth St Mary s —H P
Preston Royal Infy —Orth H S
Plymouth South Devon & East Cornwall —H S (Jr Reg) cas & frac H S (obst & gyn) H S s H O (anes)
Pontefract Gen Infy & Hydes —R S O (Jr Reg) H P H S
Rochdale Infy —Cas H S
Redruth Camborne Redruth Miners & Gen —H S
Romford Oldchurch —R H O (neuro surg)
Rochdale & Dist H M C —Jr Reg (chest dis)
Ryde Royal I W County —H S H P
Skipton The Hospital —H O
Swansea —Res Cas O Res Anes
Stannington St Mary s Mental —Reg (psych)
Skipton Gen —H S
Scunthorpe & Dist War Mem —Res Orth H O
Scarborough —R H S (surg)
Shrewsbury Eye, Ear & Throat —E N T H S
South Mimms Herts Clare Hall —Jr Reg
Shoreham by Sea Southlands —R H S
Southampton Borough Gen —H S (orth & gen surg) H S (gyn & obst), H S
Stamford & Rutland —Cas O & H P R H S
Swindon & Dist H M C —R H S (gen surg)
Stannington Northumb St Mary s —Sr Reg
Stoke-on Trent N Staffs Royal Infy —H O (anes) H O (orth)
Stoke-on Trent Bucknall Isolation —H O (med)
Stoke-on Trent Longton —H O (surg)
Shrewsbury Royal Salop Infy —Orth H S /Cas O
Scunthorpe & Dist War Mem —R.H O (E N T & rad)
Scotland North Eastern R H B —Diag Rad (Cons)
Sheffield No 1 H M C —Jr Med Reg
St Albans Napsbury Mental —Locum Tenens Jr Reg
Sutton Surrey Banstead —Reg
Salisbury Gen —Res Jr Reg (E N T)
Southport Gen Infy —Jr Reg (anes)
Southend-on Sea Gen —Res Cas O (Jr Reg)
S W Met R H B, St Helier —Sr Surg Reg, Reg (Rad)
S W Met R H B Sutton & Cheam —Reg (surg)
Swindon & Dist H M C —Res Cas O (Cent Cas Dept)
Scotland Rosslynlee Mental —H O
S W Met R H B Chichester—Cons Anes
Tilbury & Riverside Gen —H P (Tilbury)
Tilbury & Riverside Gen —H.S (gen surg & orth), Orsett
Truro Royal Cornwall Infy —H S
Tredegar Gen —H S
Taplow Berks Canadian Red Cross Mem —Jr Reg (jnr rheum)
Warwick Central Mental —Jr Reg
Wakefield Oulton Hall M D Inst —Reg (psych)
West Bromwich & Dist. Gen —Res Anes & H S
Woking Victoria —R.M O (fst post)
Wrexham Trevalyn Manor Maty —Obst. H S
Wrexham Maelor Gen —H P
Welsh R H B —Anes (Sr H M O), Mid Glamorgan, Jr H.M O (chest dis & T B), Rhymney & Sirhowy Valleys
Wakefield Yorks Pinderfields Gen —H P (thor)
Whiston County —Cas & Admission O
Yorkshire Keighley & Dist Victoria —H S
York County —2 R H S s
York City —R H S
Otago N Z —Sr Asst 3 Assts
Australia Royal Melbourne —Path

PUBLIC HEALTH

Bucks County Council —A C M O
Bootle County Borough —A M O H A S M O
Government of Iraq —Profs Anat. Rad & Pharm Lecturer (chem)
H.M Colonial Service Malaya —M O s Health O s
Inverness County Council —Asst M O Asst School M O
Lancashire County Council —Asst. Div M O s
Retford Notts —Locum Tenens
Southern Rhodesia Government —School M O (Male)

HOSPITAL NON MEDICAL VACANCY

Birmingham United Birmingham — Sr Hosp Physicist. (rad)

Notices of vacancies will appear in this form (without charge) until normal publication can be resumed

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10 Hurteau E F *J Amer med Ass* 1950 142 988

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Dr U CERLETTI (Rome) pointed out that the reactions evoked by electric shock vary widely as between different species but are relatively constant in the same species Often they may be taken to represent primitive escape or defence reactions He laid stress on the widespread somatic changes evoked by E C T, in particular those governed by the diencephalic vegetative centres and he sketched a working hypothesis to account for the beneficial effects of convulsion therapy in man

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Hypoglycæmic shock treatment was discussed by its originator, Dr MANFRED SAKEL (New York), who emphasised the therapeutic importance of coma as opposed to convulsion in the insulin treatment of schizophrenia The treatment he said, is still only a tool, whose effect "does not depend so much on the tool as upon the man who uses it

LEUCOTOMY AND TOPECTOMY

The rationale of prefrontal leucotomy was explored by Dr BARAHONA FERNANDES (Lisbon) Leucotomy, he said, is apt to provoke an increase in general responsiveness associated with a certain blunting of social judgment Intellectual changes are variable but seldom profound

Prof WALTER FREEMAN (Washington) laid great emphasis on the plane of section in relation to the ultimate outcome of operation In his experience, defects of social judgment are rare after the more anterior cuts, but this operation may fail in its purpose of symptomatic relief With more posterior cuts, on the other hand, postoperative social defects may outweigh improvement of emotional symptoms 'The important thing is to place the incision just far enough back in order to relieve the emotional disturbance without, at the same time trespassing on those parts of the brain that are requisite for adequate social adjustment" In assessment Prof Freeman considers it more important to study what patients actually do with their intelligence than to measure what they *can* do on formal tests

None the less, the effect of leucotomy on intellectual test performance was discussed by a number of contributors Dr G RYLANDER (Stockholm) reported a significant lowering in I.Q on a number of tests following the standard operation but observed that the loss was considerably less after inferior cuts He had been unable to demonstrate any intellectual changes on tests in 21 cases after undercutting

A further instalment of anatomical lessons from prefrontal leucotomy was communicated by Prof ALFRED MEYER, who summarised his findings from 122 leucotomised brains of which 61 were from patients who survived more than five months after operation His principal conclusion was that the quantitative correlation between degree of personality change and extent of prefrontal damage completely over shadows whatever tendency there may be to specific localisation within the prefrontal areas He was unable to report any decisive information from anatomical studies bearing on the pathology of functional psychosis and he issued a stern warning against premature attempts to correlate clinical with neurophysiological data 'Speculation is never more dangerous than when in the guise of the exact sciences'

GENETICS IN PSYCHIATRY

Dr F J KALLMANN (New York) in a circulated report, adduced evidence—mainly from studies of twins—supporting the hypothesis of basically single factor types of inheritance with respect to schizophrenia and manic-depressive psychosis Dr ELIOT SLATER broadly agreed as regards schizophrenia but argued that multifactorial inheritance is the more probable in manic depressive syndromes On the other hand, Prof L S PENROSE, arguing by analogy with the genetics of intelligence, thought it most improbable that any major psychosis could be attributed to single factor inheritance He also warned students of human genetics against forcing their material into simple and preconceived mendelian schemes

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545 were over the age of sixty, and not one was under thirty five Secondly, when the patients first reported, metastases were already evident in 59%, excluding those where the primary growth involved the lip Here metastases were found in only 25%, and, since these patients reported no earlier than others, metastasisation from this site is apparently slower Among the whole 800 there were 30 (3 75%) in which a second primary developed, usually this was in the digestive tract, and most commonly between the lip and the cardiac sphincter of the stomach The Wassermann reaction was investigated in rather over half the cases, and it proved positive in 16% of these It was most commonly positive with cancer of the tongue (28%), less often with cancer of the buccal mucosa (20%), and rarely with cancer of the palate (3%) and alveoli (0 5%)

As to treatment, widely different methods had very similar results When cases were grouped according to the site of the primary growth the average net survival rate was found to be surprisingly uniform at about 30% at three years, 20% at five years, and 10% at ten years (Here "net" implies the inclusion of all cases treated except those untraced and those dead of intercurrent disease) In most buccal and oropharyngeal sites teleradium proved more effective than X ray therapy It seems, however, that early cases of cancer of the lip respond best to X ray therapy, where metastases had not already developed this provided a three year net survival rate of 91% With early cases of cancer of the anterior two thirds of the tongue surgical treatment gave the best results (6 out of 7 surviving for three years), with cases in all stages treated surgically, by radium or X rays, or by combined methods the net survival rate was 30% at three years, 20% at five years, and 14% at ten years With primary lesions elsewhere in the mouth radium gave significantly better results than X rays, but with lesions in the oropharynx X ray therapy proved no less effective than radium

MEDICAL MYCOLOGY

AT the turn of the century, the classical and dominating work of Sabouraud on the dermatophytes fostered the impression that medical mycology was concerned solely with the ringworm fungi and obscured the remarkable developments in the study of systemic mycoses which were taking place in South America Coccidioidomycosis, rhinosporidiosis, and chromoblastomycosis, which have all proved to be important and widespread diseases, were first described in Latin America, and a strong tradition of investigation in medical mycology has been maintained there It was therefore appropriate that the first International Congress for Microbiology to devote a separate section to medical and veterinary mycology should have been the one held last August in Rio de Janeiro on the fiftieth anniversary of the foundation of the Instituto Oswaldo Cruz—a laboratory which has made big contributions to medical mycology

At the four well attended sessions of the new section more than forty papers were given by speakers of ten different nationalities, and despite linguistic difficulties the discussion was lively and well informed Naturally, South American speakers predominated and the emphasis was on diseases of local importance, such as South American blastomycosis Many of the visitors had more to learn than to give and they were inclined to wonder whether thorough study might not show that mycotic diseases are no less prevalent elsewhere

Though part of the present confusion in the nomenclature of fungi of medical importance is due to taxonomic uncertainties, much of it could be eliminated by international discussion and agreement The 4th congress, held in Copenhagen in 1947 appointed a special committee on medical and veterinary mycopathology, and the latest congress confirmed this committee in office At Rio the committee met and agreed to prepare a list of recommended names of fungus pathogens similar to the British list[1] but on a wider basis, to standardise the common names of mycotic diseases, to consider the standardisation of culture media, and to compile a list of the addresses of medical mycologists The secretary of the international committee is Dr A Cury, Instituto Oswaldo Cruz, Rio de Janeiro, Brazil, but anyone in Britain can obtain information about its activities from the secretary of the Medical Research Council's committee on medical mycology, 38, Old Queen Street, London, S W 1

1 Medical Research Council memorandum no 23 Nomenclature of Fungi Pathogenic to Man and Animals H M Stationery Office, 1949 Pp 16 6d

STERILISING THE GUT

DURING the last decade the mortality from operations on the lower bowel has fallen steeply At the Presbyterian Hospital, New York, it is now only 3%, compared with 15% ten years ago This fall cannot be ascribed to any one new technique, but the administration of sulphonamides and antibiotics has played some part Sulphaguanidine[1] and later succinylsulphathiazole[2] and phthalylsulphathiazole[3] have been used in attempts to sterilise the gut before gastrointestinal surgery These comparatively insoluble sulphonamides reduce the bulk of the stool and bring down the content of coliform organisms to less than 1000 per gramme The sulphonamides, however, have certain disadvantages, including slow action, a narrow antibacterial range, and toxic side effects The usefulness of penicillin, which is non toxic, is limited by its extremely rapid absorption and by its destruction by penicillinase in the lumen of the gut Moreover, coliform bacteria are relatively refractory to it As an intestinal antiseptic, streptomycin has some advantages over both penicillin and the sulphonamides, since it remains in the lumen of the bowel in high concentration and is more active against coliform organisms, on the other hand, resistance may appear within a few days

Pulaski and his colleagues[4] have now shown that the activity of streptomycin may be enhanced, and resistance deferred, by the simultaneous administration of glycuronolactone—the inner anhydride of glycuronic acid which detoxifies a number of drugs in the body (Aluminium pectinate had a similar but less pronounced effect) 'Polymyxin B,' an antibiotic derived from *Bacillus polymyxa*, proved as effective as streptomycin in suppressing coliform organisms, but proteus strains were resistant to it Pulaski and his associates say that 'Aureomycin' and chloramphenicol were not effective, but the dosage they employed may have been too low Dearing and Hellman,[5] who used slightly larger doses, report that aureomycin is the most effective of the substances they have tested

The evidence that preoperative chemotherapy significantly reduces complications and morbidity is not yet however, statistically satisfying Most of the experimental work has been on animals, and some experienced surgeons claim that prophylactic chemotherapy is unjustified because of the fresh problems it creates

PROGNOSIS OF SUBARACHNOID HÆMORRHAGE

THE increasing ingenuity of neurosurgeons in the treatment of intracranial aneurysms has focused attention on the prognosis for patients with subarachnoid hæmorrhage At the Toronto General Hospital, Hyland[6] has studied 191 cases admitted between 1928 and 1942 Altogether 100 (53%) died as a result of the attack that brought them to hospital This is in line with earlier accounts Thus Magee,[7] in an analysis of Ministry of Pensions cases, recorded 52 deaths among 150 patients in initial attacks, and Hamby[8] 44 deaths among 130 In the Canadian series, of the 100 who died, 26 had recurrent hæmorrhage while in hospital, usually within two weeks of the initial attack. Factors pointing to a poor prognosis were unconsciousness at the onset, pre-existing hypertension, signs suggesting intracerebral bleeding, and advanced age, of the 48 patients between the ages of sixty and eighty, 33 (69%) had fatal hæmorrhages Necropsies on 55 of the cases brought to light ruptured aneurysm in 44, subtentorial angioma (which had been diagnosed during life) in 1, and cerebellar hæmangioma in 1, in 9 no bleeding point was discovered, but it was thought that the source of the hæmorrhage was a leaking aneurysm

In Sweden, Ask Upmark and Ingvar[9] have followed up 138 patients admitted to the university clinics at Lund and Uppsala Of these, 38 (28 3%) died during the first attack, the average time of death being the ninth day after the hæmorrhage The post mortem findings are of interest in connection with the probable congenital basis of intracranial aneurysms In 47 necropsies, presumably including some on patients who

1 Marshall E K Bratton A C White H J, Litchfield J T *Bull Johns Hopk Hosp* 1940 67 163
2 Poth E J *J Amer med Ass* 1942 120 265
3 Poth E J *Surgery* 1945 17 773
4 Pulaski E J Connell J F Seeley S F *Ann Surg* 1950, 132 225
5 Dearing W H Hellman F R *Proc Mayo Clin* 1950 25 87
6 Hyland H H *Arch Neurol Psychiat* 1950 63 61 See also Richardson J C Hyland H H *Medicine* 1941 20 1
7 Magee C G *Lancet* 1943, II, 497
8 Hamby W B *J Amer med Ass* 1948 136 522
9 Ask Upmark E Ingvar, D *Acta med scand* 1950 138 15

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innate component of high grade defect is demonstrated both by the close fit of the Gaussian curve to the level indicated and by the degrees of resemblance between high grade defectives and their relatives But he agreed with Prof Penrose in ascribing inborn low grade defect to single major genes or chromosome abnormalities He held that, for distinguishing between these two broad classes of endogenous mental defect, the psychometric method is at present the most useful tool

Dr ELIOT SLATER reviewed in various communications important evidence bearing on constitutional predisposition to psychoneurotic illness and its relation to environmental stress

TRENDS IN PSYCHO ANALYSIS

Dr F ALEXANDER (Chicago) advocated a method of analytical procedure somewhat more active than the classical Freudian method He stressed the dangers of overdependence on the physician which are liable to result from rigid adherence to the orthodox method and the need for assisting the patient actively to adjust to his current milieu Recent theoretical developments in psycho analysis were reviewed by Miss ANNA FREUD, with special reference to the problem of aggression She also advocated well-designed sociological studies—e g of displaced children—to provide experimental checks on psycho analytic theory Dr M LEVINE (Cincinnati) commented on the progressive integration of psycho analysis with psychiatry and general medicine which he believes to be taking place in the United States

A general impression left by this symposium was that psycho analysis is now passing into a conservative phase with little prospect of fresh theoretical advance

MENTAL TESTS

The place of mental tests in clinical psychiatry was forcibly discussed and tended to evoke extreme attitudes In an admirably balanced communication, Dr MANFRED BLEULER (Zurich) urged that "projection methods" (e g, the Rorschach test) have great value in displaying clinical syndromes already known but can contribute nothing new to psycho pathology Dr D RAPOPORT (Stockbridge, U S A) on the other hand, argued in a circulated abstract that diagnostic testing procedures should be more closely integrated with psychiatric theory Dr P PICHOT (Paris) showed himself more closely in sympathy with the psychometric approach than is usual among clinicians and was much opposed to the empirical methods of test-validation in current use He favoured a somewhat stricter rationale of test construction based on the methods of factorial analysis

SOME OTHER TOPICS

Psychopathology of Delusions—This symposium provided evidence of a rapprochement between the organic and functional approaches to psychotic thought disorders. Dr G E MORSELLI (Novara) drew parallels between delusions in primary psychoses and kindred phenomena observed in anosognosia, depersonalisation, and mescaline intoxication Dr P GUIRAUD (Paris) attempted to relate delusional thinking to derangements at the diencephalic level depending either on structural lesion or emotional disturbance Dr W, MAYER GROSS, in a general discussion of paranoid states strongly advocated their inclusion in the category of schizophrenias "Paranoia," he maintained, "remains an idealised picture never reached in clinical reality"

Experimental Neuroses—Prof R W RUSSELL outlined the main methods of inducing experimental neurosis in animals and advocated the comparative approach to many problems in human psychopathology A Pavlovian interpretation of traumatic neurosis was offered by Dr H J SHORVON

Electro-encephalography—Dr DENIS HILL suggested that E.E G research is of theoretical rather than practical importance in present-day psychiatry He discussed disturbances in thalamocortical relations as reflected in the E E G and examined their relevance to behaviour He considered also some problems arising from the special nature of the E.E G in catatonic schizophrenia

Experimental Catatonia—Dr H DE JONG (Los Angeles), reviewing a long series of bulbocapnine experiments, concluded that experimental catatonia is a general form of reaction of the C N S Though it has no specific etiology, its threshold seems to be lowered in certain conditions in which there is a disturbance of liver function

Six volumes of proceedings of the plenary sessions (published by Hermann & Cie Paris) are available It is hoped that abstracts of discussions and symposia will be printed later

SENIOR HOSPITAL MEDICAL OFFICERS

AFTER discussion with professional bodies the Ministry of Health announce (R.H B [50]96) agreement that the following posts may suitably be filled by S H.M O S

Blood transfusion
Posts below that of director of regional blood transfusion service

Diseases of the Chest
Posts in a restricted part of this field (e g, limited to routine tuberculosis dispensary work) medical officers of sanatoria either in charge of small units or below the rank of superintendent in charge assistants to a consultant in charge

Geriatrics
Posts below the rank of head of a large department, and other posts where the scope for investigation and active treatment or the clinical responsibility is insufficient to justify consultant status

Infectious diseases
Medical superintendents of small hospitals, at other hospitals posts below that rank

Obstetrics (practised alone)
Posts at antenatal and postnatal clinics posts in maternity departments which are under the general supervision of a consultant.

Ophthalmology
Posts primarily concerned with non operative work—e g refraction

Orthopædics
Posts primarily concerned with non-operative work.

Pædiatrics
Posts at welfare centres and other posts primarily concerned with child welfare

Physical medicine Venereal diseases
Post of officer in charge of a small clinic in large departments posts other than head of the department

Psychiatry and mental deficiency
Posts of medical superintendent of small institutions (at larger mental institutions some posts below that rank) posts primarily concerned with limited fields of psychiatry

Hospital establishments should include an adequate complement of widely experienced *anæsthetists* of consultant status Some hospitals will also often need assistant anæsthetists of S.H.M O grade The staff of a *pathological department* should consist of consultants and trainees, with a limited field for the appointment of assistant pathologists paid on the S H M O scale The complement of consultants must depend on the size of the department, but where there are separate sections each in the charge of a pathologist under the general control of the head of the department—e g, morbid anatomy, biochemistry, hæmatology, bacteriology, blood transfusion—each should be of consultant status The establishment of *radiodiagnostic* or *radiotherapeutic departments* should include at least one practitioner of consultant status with trainees Where this complement is not sufficient to deal with the work, it may be necessary to appoint assistant radiologists of narrower training and with more limited responsibility than the consultant, paid on the S H M O scale

The establishments of departments of *general medicine, general surgery*—including urology and proctology—*obstetrics and gynæcology* (practised together), *cardiology, dermatology, otolaryngology, neurology, neurosurgery*, and *plastic and thoracic surgery* should not include S H M O posts

The Ministry has asked regional hospital boards to revise their establishments in accordance with the above principles. This revision, however, will not affect the personal status of a doctor whose post may be regraded Thus the S.H M O whose post is regraded as consultant and the consultant whose post is regraded as suitable for an S H M O, will both retain their present personal status When a post which has been regraded becomes vacant it will be advertised according to its new status When there is no suitable applicant of consultant status a consultant post may no longer be offered to one of the applicants as an S.H M O post[1] If the field of consultant applicants cannot be widened by a rearrangement of the duties of the appointment, it will be readvertised as an S H M O post

The Ministry also asks boards not to overlook the possibility that some part-time S H M O appointments—i e, assistant anæsthetists, assistant geriatricians, assistant pædiatricians, or M O S in charge of small infectious disease hospitals—may appropriately be filled by general practitioners

1 See *Lancet* Aug 19 1950 p 296

From Letters to the Editor

Methonium Compounds in Hypertension—In reference to the articles by Dr Turner and Dr Saville (Sept 2), I should like to refer briefly to our experience here

Dr Restall and I have lately reported (*N Z med J* 1950 49, 206) some results which we regarded as hopeful and further work has been undertaken with Dr K. S Alstad The effect of methonium halides has now been studied in 80 patients with substantial hypertension and 26 patients with hypertension of the more severe types, including 9 with malignant hypertension, have been treated for one to nine months Our general impression is that the methonium salts provide the most generally applicable method of controlling the blood pressure (B P) level (where this is desirable) in various forms of arterial hypertension The cases studied include some of labile and fixed types of essential hypertension, essential hypertension with persisting or recurring high B.P after sympathectomy malignant hypertension hypertension from chronic nephritis renal insufficiency in hydronephrosis renal tuberculosis, the acute phase of pregnancy toxæmia and hypertension following pregnancy toxæmia In all cases the B.P could be reduced—in all but 2 substantially In many instances falls of 60–120 mm Hg in the systolic pressure and of 15–50 mm Hg in the diastolic pressure were observed

In conformity with suggestions as to the pathogenesis of essential hypertension (*Brit med J* 1949 1, 791), we have worked on the principle that effective control over the B.P level is essential in treatment high B.P is not to be regarded as merely symptomatic but as the means whereby multiple underlying pathological factors lead to the disabilities characteristic of the disorder Our objective therefore, has been to reduce B.P as much as seemed safe and practicable In order to do this we took advantage of the postural fall of B.P., patients slept in cardiac beds with the body inclined at 45° and the legs slightly lowered Thus we needed comparatively small doses and have had few side actions As far as possible we aimed at having the average systolic level below 160 mm Hg As soon as patients were ambulant they were encouraged to sit upright and to stand

Another advantage of having the patient propped up during the action of the drug is that if the B P falls excessively symptoms can be relieved within a few minutes by the patient lying flat If much larger initial doses (e g , 100 mg) are employed so as to reduce the B.P when the patient is horizontal, there is a smaller margin of safety and parasympathetic effects are prominent In the interest of safety I think that in hypertensives the initial dose of the halide, given subcutaneously or intramuscularly with the patient in the sitting posture should not exceed 15 mg Even with this small dose the systolic B.P may fall to 90 mm Hg but when the patient lies down the pressure rises promptly to say 150 mm At first, subcutaneous injections of 15–25 mg may be given twice or thrice daily Patients almost invariably acquire tolerance to the drug, and the dose has to be increased considerably in order to maintain B.P reduction Eventually the subcutaneous dose may be stabilised at 50–250 mg twice or thrice daily

These drugs can be used with no more danger than other powerful agents provided their effect is carefully observed particularly in the early stages of treatment Standard dosage is unsatisfactory for an amount which would be ineffective in one patient would be dangerous in another Effective doses should be approached over a period of several days A salt-poor diet greatly enhances the effects of methonium halides.

When the B.P has been reduced in this way for a large part of the twenty four hours subjective and objective benefits have resulted In 8 cases of malignant hypertension with papillœdema the following results were obtained in 4 the papillœdema disappeared in 3 it greatly diminished and the physiological cups reappeared, and the sole remaining evidence of papillœdema was an appearance suggesting œdema of a part of the disc margin the remaining patient, who commenced treatment recently shows unmistakable improvement but papillœdema is still present One of these patients had a recurrence of papillœdema while under treatment but is now showing improvement again In all grade III hypertensives so far treated hæmorrhages retinal œdema and soft exudates have either decreased considerably or disappeared In all cases headaches have disappeared or greatly diminished There has been reduction of such symptoms as breathlessness on exertion and dizzy attacks , and such manifestations as gallop rhythm and alternation of the pulse have disappeared or diminished considerably In a few instances there has been slight diminution of heart size and slight return of the electrocardiographic picture towards normal

These changes are not due exclusively to the use of pentamethonium and hexamethonium Pest in hospital may lead to considerable subjective and some objective improvement The number of patients studied is small but the notable clinical improvement, associated with effective lowering of the B.P is of a degree seen in a smaller proportion of patients treated by other methods

So far we have regarded recent cerebral or coronary thromboses as contra indicating methonium treatment, but in a tentative and exploratory way we have treated a few hypertensives with angina of effort Our experience is limited to nine months and unforeseen difficulties may emerge but the preliminary investigations suggest that it is now unwise to submit any patient to the risk trauma, and uncertain benefit of sympathectomy until there has been a trial for several months of effective B.P reduction using methonium halides and taking advantage of the effect of posture In some cases the combined effect of a salt-poor diet (0 2 g sodium) and pentamethonium or hexamethonium seems particularly favourable—Prof F H. SMIRK F.R.C.P (Department of Medicine, Medical School, Dunedin, New Zealand.)

No Tools—Your leading article of Sept 23 may leave the impression that better staffing and equipment of chest clinics, with the chest physician doing an increasing amount of domiciliary treatment is the most urgent need of the tuberculosis service I submit that the most urgent problem which has been the same for twenty years is shortage of beds and of nurses At this hospital five chest clinics, serving a population of 400 000, are accommodated in the outpatient department The chest physicians attached to these clinics have a tuberculosis block of 56 beds together with a small number of beds in the general wards for the investigation of non tuberculous pulmonary disease Facilities for minor thoracic surgical procedures have existed since 1943 and since 1947 a full major thoracic surgical service has been operated Active domiciliary treatment has been carried on by the chest physicians since the clinics were opened and experience has led to the conclusion that this method is no reliable substitute for hospital and sanatorium treatment Streptomycin P.A.S and for that matter pneumoperitoneum and phrenic crush cure few patients but they give time for planning the appropriate attack on the disease Any measure carried out in the home can be better carried out in an institutional bed and more beds are obviously needed " But I think that despite your optimism the Minister s request to hospital boards will not improve matters much We cannot be satisfied until a patient with recoverable pulmonary tuberculosis can be admitted into hospital within a week of diagnosis and does not return home until his disease is controlled and non infectious—H F HARWOOD, M.R.C.P (chest physician St Helier Hospital Carshalton Surrey)

First International Congress of Internal Medicine.—This congress reported in your issue of Sept 23 embodies the conception of internal medicine as a leading specialty in contemporary medical practice It was right to hold this first congress in Paris, because that great school has always opposed itself to the splitting of internal medicine and it was right to select London for the second congress because British physicians showed the importance of the neurochemical integration of the organism and gave the death blow to Virchow s cellular theory

According to present-day ideas internal medicine is " all or none This does not mean that the narrow medical specialties are to be rejected but that their position has to be re-assessed Plato s dictum comes again to the fore ' Good physicians apply their treatment to the whole body and attempt to treat the sick part or organ by treating the whole individual This means that, say a cardiologist or gastro enterologist must assess the whole individual above all, although he may apply his special techniques to a local manifestation Thus cardiology, gastro-enterology endocrinology, and even neurology or dermatology can no longer be considered as specialties in their own right but as subspecialties of internal medicine which the great American clinician, Da Costa, characterised as the greatest of all specialties We should not speak of cardiologists or gastro-enterologists but of internist cardiologists and internist gastro-enterologists , and special diplomas—at all events in medical branches—should

be awarded only to those who already hold a postgraduate qualification in internal medicine of the M R C P type

Will the congress succeed in fostering this new spirit? Those who took part in the Paris congress were mostly from the countries of Greco Latin culture, including England, Latin Canada, and Latin America, and also Scandinavia North America was scarcely represented, Germany not at all Are we going to split into those who are animated by a comprehensive and humanistic intellect of the Greco Latin culture and those who are obnubilated by the power of technique and machine? The London congress will have a tremendous significance from this point of view —A P CAWADIAS, F R C P (London, W 1)

Kernicterus —In your issue of July 1, Dr Gerrard speculates on the possibility that kernicterus may be caused by hypoglycæmia I have had the same thought, and have found it easy to produce kernicterus in rats by insulin shock combined with intravenous injection of bilirubin However, I cannot confirm the presence of hypoglycæmia in infants who develop kernicterus —RICHARD L DAY, M D (Department of Pediatrics, College of Physicians and Surgeons, New York)

Treatment of Myasthenia Gravis —Your leading article of Aug 19 takes a distinctly unfavourable view of thymectomy for the treatment of this disease You apparently suggest that results would best be judged by electromyography, but this method, though of undoubted value in the diagnosis of some disorders, can only be used to record the electrical activity of a small number of muscles at any one time, and it is very difficult to take records from the ocular, bulbar, and other muscles commonly involved in myasthenia Over a long term the best guide is surely the patient's general activities as compared with before operation this method was adopted by Keynes in following up his patients

Some patients do improve notably in the first two to three weeks after operation, but in the majority who benefit from operation improvement is slow and steadily progressive over many months This slow improvement does not seem to me to be in any way incompatible with the operation being the cause of it Unfortunately at present we are unable to tell which patients are likely to benefit from thymectomy, but Keynes's follow up, carried out in association with more than one physician, shows that of the patients without thymic tumours 32 5% were completely relieved of symptoms while another 33 3% had only minimal symptoms, and in my view the most significant fact is that there has been no relapse of myasthenic symptoms in any of these patients during follow up periods of six months to eight years

Thymectomy is certainly not the final answer to the treatment of patients without thymic tumours, but from my experience of following up some 65 of the patients on whom Mr Keynes has operated I have no doubt of the benefit in about 60% of cases —J W ALDREN TURNER, F R C P (St Bartholomew's Hospital)

In England Now

THE man who is thinking of going to New Zealand was discussing seasickness at our sherry party His own doctor had recommended a well known proprietary remedy, but a doctor friend had told him that this would make his heart go to pieces He looked miserably in my direction I suggested 'Dramamine,' but he said it was difficult to get "Well," I asked reasonably, "why take any drugs at all?" And I told him how when I go for a long sea voyage I lie on my back until I am used to the motion—about two days, as a rule—and then all is well He still looked dissatisfied "My friend advises covering one eye," he mumbled, "and plugging both ears as well" The female guests around twittered that this would be very awkward "Cover one eye and plug the opposite ear," I suggested He brightened a little at that and said he would buy an eye shade Then someone thought of Nelson who was notoriously subject to seasickness I inquired whether this tendency had persisted after he lost his eye, but no one knew, and we parted vowing to make it a subject for research Are one-eyed people seasick?

* * *

I resent the printing dispute THE LANCET is now too light to wake me by falling from the letterbox on to the mat

News

In England and Wales notifications of poliomyelitis in the week ended Sept 30 were paralytic 222 (208), non paralytic 109 (151), total 331 (119) Figures for the previous week are in parentheses Uncorrected notifications for this year total 6351 The corresponding figures for 1947, 1948, and 1949, were 6605, 1149, and 3611

On Tuesday Oct 17 at 5 1 M at St Mary's Hospital Medical School London W 2, Prof U S von Euler of the Physiological Institute Stockholm will give a lecture on Hormones of the Sympathetic Nervous System and the Adrenal Medulla

Dr J M R Walshe F R S, is to give the Schorstein lecture at the London Hospital E 1 on Thursday, Oct 19, at 1 15 P M He is to speak on Clinical Medicine

At a meeting of the Society of Medical Officers of Health on Thursday, Oct 19 at 5 30 P M at B M A House London W C 1 Dr J M Gibson M O H for Huddersfield, will deliver his presidential address, entitled Give Us the Tools

The Minister of Education has appointed a committee to inquire into medical, educational, and social problems relating to maladjusted children The members include Dr J F A Underwood (chairman) Dr A I Alford Dr Mildred Creak Dr H M Cohen, Dr Wilfrid Sheldon, Dr W Rees Thomas and Dr A Torrie

The first meeting of the West Midlands Physicians Association will be held in Birmingham on Oct 21 Further particulars may be had from Dr A G W Whitfield Queen Elizabeth Hospital, Birmingham, 15

Dr Charles Hill is to preside over the fourth general assembly of the World Medical Association, opening in New York on Oct 16 B U P reports that the medical organisations of 39 countries will be represented

Dr H Balme has been appointed by W H O and the U N department of social affairs as their consultant adviser to UNICEF on the rehabilitation of crippled children in European countries

A conference on the Physical Care of Books is to be held at the headquarters of the Library Association Chaucer House Malet Place London W C 1 on Wednesday, Oct 18 at 6 30 P M, when Dr R E O Williams is to speak on the Spread of Infection by Books

At Oxford University freshmen are being invited to submit to mass radiographic examination

The honorary fellowship of the Royal College of Obstetricians and Gynæcologists has been conferred on Dr G W Kosmak editor of the *American Journal of Obstetrics and Gynæcology* Mr Geoffrey Keynes and Dr R J Minnitt have been elected to the fellowship under the rule permitting the election of practitioners who are not obstetricians or gynæcologists but who have made contributions to the specialty

The unit for 14 premature babies mentioned in our issue of Aug 19 (p 312) was opened at University College Hospital on Oct 1 Babies under 5 lb who need special care can be admitted to the unit by arrangement with the children's house physician (Euston 5050)

The Treasury has sanctioned the purchase of 17 acres at Northwick Park near Harrow for the site of the new Charing Cross Hospital The new hospital is to have 800 beds, an outpatient department, and medical school It is not known when building will start

In a letter to Mr David Rees Evans, whose treatment of cancer has been publicised by *Picture Post* (see *Lancet* Sept 16 p 375), the Minister of Health says that he has asked Sir Robert Robinson, F R S Sir Alexander Fleming, F R S, Sir Ernest Rock Carling F R C S and Prof H P Himsworth F R C P to act as an independent committee to consider your claims and to advise whether they warrant further investigation and if so the way in which any investigation should proceed' In making this offer to Mr Evans he adds "I must ask that you on your part will agree to abide by any decision which they may reach and furthermore, that you will be prepared to submit to the committee should they require it full details of your materials and methods and will no longer insist that these can be disclosed only during the actual treatment of patients Mr Evans has agreed to submit to the committee 'the fullest records I can of past cases and whatever they may ask concerning my materials and methods He believes however that his work "can never be fully and finally tested unless actual treatment of patients forms part of the investigation'

CORRIGENDUM *Hazards of the Aged Hip* —In our leading article of Sept 30 the American estimate of the expectation of life for women of 60 should have been given as *5 years* (not *5 times*) greater than that of a man of the same age

Births, Marriages, and Deaths

BIRTHS

FOX —On Sept 16, in London the wife of Dr P B Fox a daughter

GWYNNE WILLIAMS —On Oct 5 in Denbigh, the wife of Dr T Gwynne Williams—a son

ILLINGWORTH —On Oct 1 to Dr Cynthia Illingworth M R C P (nee Redhead) wife of Prof R S Illingworth F R C P —a son

MACPHAIL —On Sept 11, in London to Dr Margaretta Macphail (née Hutchinson) wife of Dr D S Macphail—a daughter

MATTHEWS —On Sept 12 at Guildford the wife of Dr H W Matthews—a daughter

SCHRYVER —On Sept 26 at Epsom to Dr Nancy Richardson wife of Mr Peter Schryver—a son

MARRIAGES

WALL—YOUNG —On Sept. 30 at Potts Wood Kent Arthur Ernest Wall F R C S to Eva Margaret Young

ACADEMIC AND EDUCATIONAL

Empire Rheumatism Council Post graduate weekend course at Apothecaries Hall Nov 17–19 Fee 2 gns, with application to Gen Secretary Tavistock House (N) Tavistock square, W C 1

Institute of Orthopædics Course in diagnostic and prognostic methods in orthopædics Nov 6–11 Fee 7 gns Apply Dean 234 Great Portland street W 1

Bristol University Professor of Obstetrics Lecturers in Medicine and Surgery (£1500–£2000) Apply to Registrar (closing date Oct 28)

London Hospital Medical College Jr Lecturer in Morbid Anatomy (£900–£100–£1100) Apply to Secretary (closing date Nov 6)

LIST OF HOSPITAL VACANCIES

Albert Dock Orth & Frac E 16—Rec Room O
Belgrave for Children S W 9—Res H O
Chelsea for Women S W 3—H S (Reg)
Forest Gate E 7—H O (2nd or 3rd post) - obst
Hampstead Gen N W 3—H P H S Cas O
Lewisham, S E 13—H O (obst & gyn)
London E 1—Sr Reg (thor surg) Reg—(gen med)
London Jewish E 1—H P
London Chest, E 2—2 R H P s, R S O (Jr Reg or Reg)
Mothers (Salvation Army) E 5—Obst R.M.O (H O, 3rd post) Female
Manor House N W 11—R S O (Jr Reg)
Memorial S E 18—H S (gen surg gyn & obst.)
Mile End E 1—Res Jr Gyn & Obst Reg
North Middlesex N 18—Sr H S (gen & thor surg) H.P H Anæs
Queen Elizabeth E 2—H O.s
Queen Mary's E 15—H P H S
Queen Charlotte s Maty W 6—Jr Obst O (Reg) Jr Dist. Obst O (Jr Reg)
Royal Free W C 1—1st Asst. (Sr Reg) diabetic Sr Surg Reg H S (orth) Cas O (Female) Anæs Dep M.O & H P Sr Med Reg
Royal Free W C 1—Reg (Rad Dept), Res Asst Path (H O)
Royal Northern N 7—Rad
Royal Northern N 7—H.P (2nd or 3rd post)
Royal Masonic, W 6—Visiting Urological Surg
S E Met. R H B—Cons E N T Surg (Camberwell)
S E Met R.H B—Cons Anæs (Thor Surg Unit Brook Hosp S E 18)
S E Met R H B—2 Cons Radiols. (Seamen s & Bromley)
St Alfege s S.E 10—H P
St Alfege s S E 10—H.O Obst
St Mary s W 2—Res Cas Surg (Jr Reg, or H O)
St. Ann s Gen.—H.P (inf dis)
St George s S W 1—1st Asst Obst & Gyn (Reg or Sr Reg)
St. Paul s, W C 2—Sr Reg
St. Stephen s S W 10—H P (2nd or 3rd post) Sr H P
South London for Women & Children S W 4—Gyn H.S (Female)
Tavistock Clinic, W 1—Psych.
Whittington N 19—H P H S H S (g u) H.S (obst & gyn.) 3rd post

Provincial

Ashton Hyde & Glossop H.M.C—H S (orth) Reg (chest & T B)
Ashton u Lyne Dist. Infy—2 H S.s
Ashford Middx—Reg (gyn) Staines Hosp
Altrincham Gen—Asst. R.S O (2nd or 3rd post)
Aylesbury Royal Bucks.—H.S (E N T & ophth.)
Banstead Surrey Cuddington—H O
Bath. Royal United.—H.S (gyn & obst)
Bath Royal United—House Anæs
Bath. St Martin s—H.P
Barnsley Beckett—Cas O H O (Special)
Birmingham Queen Elizabeth—R M.O (Jr Reg or Reg)
Birmingham United—Reg or Sr Reg (psych)
Birmingham R H B—Cons Venereol (Wolverhampton & Walsall)
Birmingham Solihull—H O (2nd or 3rd post)
Birmingham Rubery Hill—H P (3rd post)
Birmingham Hollymoor—H.P (3rd post)
Birmingham 18 Dudley Road—H S (E N T)
Barrow in Furness North Lonsdale—R H S
Beverley Yorks Westwood—H S
Bebington Wirral Clatterbridge Gen—H S (orth)
Billericay St. Andrew s—H S (gen surg & orth)
Billericay St Andrew s—Obst Reg
Bradford Royal Infy—Reg (orth)
Bradford Royal Infy—H S
Bradford St Luke s—Jr Reg Anæs
Bradford St Luke s—H O (anæs)
Brighton 7 Royal Sussex County—H P
Brighton & Lewes H M.C—2nd Res H S (E N T)
Bromley Group H M.C—Sr Reg (pæd)
Beverley Yorks Broadgate—Jr Med Reg
Blackpool & Fylde H M.C—Jr Reg (anæs)
Bristol Charterhouse-on Mendip San—Jr H O
Bristol Ham Green Hosp & San—Jr H O
Bristol Cossham/Frenchay H M C—H S (neurosurg)
Bury Gen—Cas O H S
Bishop Auckland Gen.—H.P
Bournemouth. Royal Victoria—H.S (ophth & E N T)
Broxburn Bangour—H O s (psych)
Burley in Wharfedale Scalebor Park Mental—2 Jr Regs
Bowdon Ches Manchester Throat & Chest—Jr E N T Reg H O
Cambridge Addenbrooke s—H P (2nd or 3rd post)
Cambridge Addenbrooke s—H S (oto laryn)
Coventry & Warwick—H P
Cottingham Castle Hill & Sanatorium—H O.s
Chesterfield & North Derbyshire Royal—H O (cas)
Carmarthen West Wales Gen.—H S R S O
Chelmsford & Essex & St. John s—H.S. (Spec Depts)
Chelmsford & Essex—H.P
Chelmsford St John s—H.P
Cheltenham Sunnyside Maty—R Obst O
Cheddleton Staffs St. Edwards—Psych Jr Reg or H.P
Carshalton St Helier—Jr Chest Reg
Carshalton St. Helier—Sr Reg (obst. & gyn)
Canterbury Kent & Canterbury—H S (E N T & E)
Cardiff Llandough—H P (Pneumoconiosis Research)
Chester City Hosp & Royal Infy—Med. Reg (gen med & cardiac)
Chester Royal Infy—M.O (Jr H.M O), orth & cas
Coleshill Hall Warwick (Mental Defectives)—Locum Jr H M.O
Coleshill Hall, Warwick (Mental Defectives)—Sr Reg
Dalwhulme Park—Med Reg
Darlington Mem—E N T Reg Cas O
Dewsbury Gen—H S
Doncaster Royal Infy—H S (E N T & ophth) H S
Doncaster H M C—Jr Reg (chest clin)
Dudley Guest—H S C O Res Anæs
Dorchester Dorset County—Surg Reg
Dumfries Royal Infy—Res Anæs
Edgware Gen—R H.P
East Anglia R H B, Norwich—Cons E N T Surg
East Anglia R.H B, Peterborough—Cons Path
East Anglia R H B St Audry s Mental—Sr Reg (psych)
East Anglia R H B Papworth—Sr Surg Reg (thor surg)
East Anglia R.H B East Suffolk & Ipswich—Anæs Reg
East Anglia R H B, Stamford & Rutland—Surg Reg
Enfield Chase Farm—H S (1st post) gen surg & orth
Farnborough Kent.—H P (pæd) H.S
Farnham Surrey—Asst Obst. O (H O)
Godalming King George V San—H O (med)
Griffithstown Mon County—Jr H M O (obst & gyn) Jr H M.O (orth)
Grantham & Kesteven Gen—H O (surg)
Guildford Royal Surrey County—H.P
Great Barrow Barrowmore—R.M O (Male) Jr H M.O
Grimsby Gen—Res Anæs
Hereford Gen—H S (2nd post), cas E N T & frac
Hereford Burghill & Holme Lacy—Res Jr Reg or Locum
Haverfordwest Pembroke County War Mem—R.S O H S
Huddersfield Royal Infy—Jr E N T Reg, Rad Reg
Hailsham Sussex. Hellingly Mental—H O
Hailsham H M C—Reg (psych)
Halifax Gen—Jr Obst. Reg
Hinckley & Dist.—Res H S & C O
Hounslow Middx.—H S (cas anæs &c) H P
Harrogate Royal Bath & Rawson Conval Wing—R M.O (2nd or 3rd post)
Hertford County—H P (2nd or 3rd post)
High Wycombe & Dist. War Mem—Res H O (surg) 2nd post
Hull Royal Infy—H S (E N T) Orth H S
Hull Royal Infy—H P
Hull Royal Infy—H S
Hull Victoria for Sick Children—H P
Huntingdon County—R H O (med & anæs)
Irvine Ayrshire Central.—Jr H.M.O (Inf & San Units.)
Ilford King George—H P

Ilford King George—H S
Isle of Man Ballamona—2nd Asst Phys (Male) Jr Reg
Ipswich Borough Gen—H S (gen surg)
Ipswich E Suffolk & Ipswich—H S (gen surg) H S (orth & frac) H S (E N T ophth) C O & Asst H P
Ipswich E Suffolk & Ipswich—C O & Asst H P
Isleworth W Middlesex—Locum Tenens Anæs (Reg or Sr Reg)
Larbert Stirling Royal Scottish Nat Inst—Jr H M O
Leamington Spa Warneford Gen—R H S (E N T & ophth) 2nd or 3rd post
Lincoln Bracebridge Heath—Jr H.M.O
Lincoln Burton Road—R.M O (Jr H M.O)
Leeds Public Dispensary—Sr Cas O (Jr Reg)
Leeds United Leeds & Leeds R H B—Sr Reg (anæs)
Leeds United—Reg (psych)
Leeds United & University—Sr Reg and Tutor Orth Surg
Leeds Gen Infy—Reg or Sr Reg (orth)
Leeds Gen Infy—Reg or Sr Reg (anæs) Reg & Sr Reg (National Radioth Centre) Reg or Sr Reg (surg) Reg (Male) E N T
Leeds St Mary s—Locum Res Obst O (Reg)
Leeds R H B—Reg (gen surg) Halifax, Reg (obst & gyn) Dewsbury Reg (radiol), Huddersfield Med Reg (Hull A)
Leeds R H B—Asst Phys I D (Sr H.M O)
Leeds R H B—Cons Anæs s (Hudders field) (Bradford) (Hull)
Liverpool E N T Infy—Sr & Jr Otorhinolaryn Regs
Liverpool Royal Southern—Cas O s (H O s)
Liverpool Royal Infy—Surg Reg (Sr Reg or Reg)
Liverpool. Royal Children's—Sr Cas O (Jr H M O) City Branch Res H S (H O) Heswall Branch Radiol Reg (Sr Reg or Reg) Orth Reg (Sr Reg or Reg)
Liverpool R.H B—Jr H M.O (blood trans)
Liverpool R H B—Non res Psych s (Sr H M O s)
Liverpool Walton—Psych H P
Manchester 19 Duchess of York Babies—H P
Manchester 13 St Mary's—H P (neo natal)
Manchester Northern—R H O (surg)
Mansfield & Dist Gen—Sr H S (acc & orth)
Mansfield Harlow Wood Orth—R H S (2nd or 3rd post)
Newcastle upon Tyne R H B—Reg (phys med) Durham & N W Durham
N W Met R H B—Asst Chest P (Sr Reg) Luton Chest Clinic
Nuneaton Manor—Gyn & Obst H S
Nuneaton Manor—H P (gen med)
Nuneaton Manor—H S (gen surg & cas)
Nottingham Gen—Aural H S Jr Aural Reg
Norwich Norfolk & Norwich—Sr Cas O (Jr Reg)
Newcastle upon Tyne Royal Victoria Infy—Surg Reg (ophth)
Newcastle Gen—H P
Newport, I W St Mary s—H S H P
Newport Mon Royal Gwent—H O (orth), H O (derm & V D) H O (E N T & ophth)
N E Met R H B—Sr Reg.s (path anæs geriatic pæd)
N E Met R H B—Sr Reg (Runwell Mental, Wickford)
Northwood Middx Mount Vernon—H S (gen surg, urol & ophth)
Pontefract Gen Infy & Hydes—R S O (Jr Reg) H P H.S
Plymouth S Devon & E Cornwall—H S (obst & gyn)
Rotherham Doncaster Gate—Res H S (2nd or 3rd post)
Rochdale Birch Hill—H P
Rochdale Infy—Cas H S
Redruth Camborne Redruth Miners' & Gen—H S
Romford Oldchurch—Jr Reg (path)
Romford Oldchurch—R H O (neuro surg)
Ryde Royal I W County—H S
Reading & Dist H.M.C—Reg (E N T)
Rochford Gen—Res H P (H O) Chest Unit & Clinic
Rochford Gen—H S
S W Met R H B—Reg or Jr Reg (Belmont Hosp, Sutton)
Skipton The Hospital—H O
Swansea—Res Cas O, Res Anæs
Scarborough—R H S (surg)
Southampton Borough Gen—H S
Stamford & Rutland—Cas O & H.P, R.H S
Stoke-on Trent N Staffs Royal Infy—H O (anæs), H O (orth)
Stoke on Trent. Bucknall Isolation—H O (med)
Stoke-on Trent Longton—H O (surg)
Shrewsbury Royal Salop Infy—Orth H S /Cas O
Scunthorpe & Dist. War Mem—R H O (E N T & rad)
Scotland North Eastern R H B—Diag Rad (Cons)
Salisbury Gen—Res Jr Reg (E N T)
Salisbury Gen—H.S
Sheffield Nether Edge—H O (maty)
Sheffield Royal Hosp Unit—Reg or Jr Reg (neurology)
Sheffield City Gen—2 Cas O.s H S (orth)
Sheffield Jessop for Women—Jr Reg (path.)
Sheffield Royal Infy Unit.—Anæs Reg
Sheffield Royal Infy Unit—Sr Reg or Reg (derm)
Sheffield Wharncliffe—H P
Sheffield No 1 H M C—Jr Med Reg
Southport Gen Infy—Jr Reg (anæs)
Swindon & Dist H M C—Res Cas O (Cent. Cas Dept)
Scotland Rosslynlee Mental—H O
S E Met R H B—Cons Surg (Orpington & Sevenoaks)
S E Met R H B—2 Cons Anæs (Bromley & S E Kent)
S E Met R H B—Derm (Brighton & Lewes)
S E Met R H B—3 Cons Paths (Mid Kent Isle of Thanet & Mid-Sussex)
Southampton Royal S Hants & So'ton—Sr Reg (path) Sr Reg (radiodiag)
Stockport Infy—H O (gen surg & ophth) H O (gen surg & gyn) H O (anæs)
Stockport Stepping Hill.—H O (med)
Stourbridge Corbett—H P C O
St Albans City—Cas O (Male)
Taunton & Somerset.—H.P (pæd)
Taunton & Somerset.—Jr H M.O (gyn. & obst) R H S (gen surg)
Taplow Canadian Red Cross Mem—H.P (juv rheum)
Tilbury & Riverside Gen—H P (Tilbury), H S (gen surg & orth), Orsett
Tilbury & Riverside Gen—Obst H.S (2nd or 3rd post), Orsett
Truro Royal Cornwall Infy.—H S (gen surg & gyn)
Truro Royal Cornwall Infy—H.S
Uxbridge Group H M.C.—T B Reg (Chest Clinic)
Wakefield Clayton—H P
Wakefield Gen—R H O (med & pæd)
Wakefield Pinderfields Gen—H.P (med) H P (neurolog)
Wakefield Manygates Maty—Obst. H.S
Wallingford Fair Mile—Jr Reg
Welsh R H B—E N T Reg (Newport & East Mon)
West Bromwich & Dist Gen—Res. Anæs & H S
Winchester Royal Hants County—H.S (gyn) H P (maty) H.S (orth.)
Worcester Royal Infy—H S (obst & gyn); H S (gen surg) H S (E.N T)
Worksop Notts Victoria—H S C O
Wolverhampton Royal—Sr Cas O (Reg) Jr Cas O H.S (frac & orth.)
Wolverhampton & Counties Eye Infy—H S
Yorkshire Keighley & Dist Victoria—H.S
York County—2 R H S.s
York City—R H S
York. Military (Civilian Wing)—R M.O (2nd or 3rd post)

PUBLIC HEALTH

Bristol City & County—Chief Asst M O (maty & c w)
Kent Educational Committee—Asst County M.O (Male) S W Kent.
Leeds City—Asst M.O H (mental health)
Leicester City Education Committee—Sr Asst Sch M.O and Asst. M.O H
Leslie Fife—Factory Doctor
Lancashire County Council—Asst Div M.O.s
Ministry/Health—M O.s (Male) Sudan
Ministry/Pensions Aylesbury Stoke Mandeville—M O, Anæs O
Ministry/Pensions Liverpool Childwall—M.O
Ministry/Pensions Worcester Ronkswood—M O Jr M.O Anæs O
Treasury Medical Service—Local M.O.s Bridgend Blaengarw and Pontycymmer (Bridgend) London Eltham S E.9 Gateshead (Newcastle) Waterlooville, Denmead Cowplain and Purbrook (Portsmouth) Scotland Larbert (Falkirk) Rothesay

GENERAL PRACTICE

Birmingham Sparkhill/Acocks Green—Urban List 1800
Grimsby Lincs—Urban List 2500
Gateshead—Urban List 2110
Newcastle upon Tyne—Urban List 2200
Stalbridge Dorset—Semi rural Dorset & Somerset lists 2200
Smethwick Staffs—Urban List 3000
Wolverhampton—Urban List 3000

HOSPITAL NON MEDICAL VACANCY

Wolverhampton H M C—Sr Asst Biochem

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Dr Hench's Visit

Dr PHILIP HENCH had to wait seven years—from 1941 to 1948—to vindicate his conviction that there exists in nature an antirheumatic substance "X" In the last fortnight he has been in Britain, telling eager audiences of the swift march of events since he and his colleagues discovered the effect of 'Cortisone' on rheumatoid arthritis Elsewhere we print in summary one of his lectures In this, and in his address to the Royal Society of Medicine on Oct 10, he made it clear that hitherto he has used neither cortisone nor adreno corticotropic hormone (A C T H) in routine treatment Their effects, he insisted, are transient In acute rheumatic fever, for example, premature withdrawal of the drug may be followed by relapse up to the time when the active stage comes to its natural end The value of these hormones is likely to be greatest in the self limiting diseases—notably rheumatic fever—and in some other disorders where, by tiding the patient over a crisis, they may save his life At the Mayo Clinic cortisone has been found to control inflammatory conditions of the eye, particularly those associated with rheumatic disease, and at the Royal Society of Medicine Dr HENCH reported that remarkable reduction of symptoms and signs had been observed in uveitis, iritis, and iridocyclitis In a case of uveitis advantage has been taken of this temporary abatement to operate for concurrent glaucoma [1]

One surprising development is the discovery that cortisone seems to be effective when given by mouth in doses comparable to those injected parenterally, and trials of oral administration are proceeding at the Mayo Clinic Growing experience is also bringing growing knowledge of dosage and side-effects In general, abrupt termination of cortisone treatment is to be abjured otherwise in rheumatoid arthritis a "rebound" relapse may be evoked This can be averted by gradually tapering off the dosage or by replacing, towards the end of treatment cortisone (which inhibits adrenocortical activity) by A C T H (which stimulates such activity) Among the side effects singled out by Dr HENCH for special mention are retention of fluid, impaired carbo hydrate tolerance, major changes in the psyche, and spontaneous fractures When side effects are trouble some, either hormone might, he suggested, be best given in smaller doses than those which would restore the blood sedimentation rate to normal or even completely suppress the symptoms

These substances act, not against the "pathological anatomy," but against the 'pathological physiology", so the earlier they are given the better In diseases where they are effective, they provide susceptible tissues with a 'seal like buffer" against the attacking irritant "They do not put out the fire," Dr HENCH declared 'They do not act like a carpenter who repairs the damage after the fire But they do provide an asbestos suit" How they act is still unknown, but this much is clear "We must learn how to coöperate with, rather than dominate and supplant, the pituitary adrenocortical mechanisms"

1 See Henderson J W *Proc Mayo Clin* 1950 25 490 and *Lancet* Sept 23 1950 p 406

Annotations

GENERAL PRACTICE AND THE R S M

ON Nov 22 the Royal Society of Medicine is to launch an enterprise of unusual interest its section of general practice will meet for the first time Those who petitioned for this new section suggested that its objects should be (1) to narrow the widening gulf between specialist and practitioner, (2) to provide for the general practitioner "an active link with currently accepted ideas', and (3) "to keep alive the academic or scientific attitude to medicine and its allied branches which is so readily lost in general practice

General practice, as its name implies, is not a special branch of medicine but a compounding of all branches, which may be shaped by the practitioner according to his resources and the needs of the patient at home or at work This is partly acknowledged by the sponsors in their proposal that the section should "provide a focal point for correlating the work of all existing sections In this respect, therefore, it would not constitute a further subdivision but rather a central link between them all' Whether this link will help or hurt the practitioner will depend on the way in which it is forged, for if speakers from other sections feel impelled to simplify their remarks, they will strengthen the damaging argument of those who would have it that medicine is of two sorts—the one rational, as practised by the specialist in hospital, and the other homespun by the practitioner in the surgery and home Over quality, therefore, the section should brook no compromise Where it might well work for compromise is at the meeting points—which now too often are the friction points—between the two groups Whole sessions could profitably be devoted to the clinical notes which pass between practitioner and specialist, to the relation between the practitioner s and the radiologist's and clinical pathologist s work, and to the division of responsibility between hospital and general practice in such disorders as epilepsy, peptic ulcer, and the disabilities of old age In these discussions each side would at least gain a better grip of the other s circumstances Indeed, the society s bold lead will have been rewarded if the section achieves only its first aim, by cutting into the mountain of misapprehension which divides the doctor within the hospital from his colleague without

PLIGHT OF THE TUBERCULOUS

THE B.M.A. Representative Body last month expressed unanimous concern "at the present inadequacy of the measures to deal with the growing problem of tuberculosis During the meeting Dr C O Stallybrass pointed out that the number of tuberculosis patients awaiting inpatient treatment has grown from 3000 to over 11 000 They may now have to wait anything from three to nine months for a bed, and, if they need thoracic surgery up to eighteen months In his view the crisis is due, first, to shortage of nurses The nurses should be paid adequately and, if they will not work in the country, should be put near towns No added risk is attached to nursing in sanatoria the risk arises mainly from the undiagnosed cases in general hospitals Dr Stallybrass ascribed the shortage of beds also to the lengthening of the average patient s stay in hospital, because of improved methods of treatment and to the increase in notifications, especially in Scotland, which is partly a result of better diagnosis, many of the newly recognised cases are in old people With over emphasis on ascertainment and under emphasis on treatment, he said, the service is getting out of step The country has 1 3 beds for tuberculosis per 1000 deaths, but this is not enough, some countries have two or three times as many, in proportion to deaths Sanatoria should have not waiting lists but waiting beds Dr Stally brass also urged that the preventive work is inadequate and the application of B C G vaccination incomplete This form of immunisation could probably reduce morbidity to a fifth

and mortality to a seventh among those receiving it, compared with controls For this work the ratio of tuberculosis officer hours to population must be raised, in Copenhagen the ratio is three times what it is in Britain. Despite improved means of prevention and cure, we still lack a coördinated scheme for this country, and "we cannot do it on the cheap" Dr D S Robertson contended that almost every case of tuberculous meningitis and miliary tuberculosis results from infection in the home The patient with open infection who waits at home for a sanatorium bed knows the risk to which his family is being exposed, and when another member of the household becomes infected he will carry his remorse to the grave The approach to the problem of tuberculosis is permeated with "apathy and a spirit of defeatism" There is urgent need of a nation wide attack to end "the scandal of a preventable disease flourishing in a civilised community"

HOSPITAL ESTABLISHMENTS

THE Ministry of Health has arranged for expert groups to examine hospital establishments As reported to the North West Metropolitan Regional Hospital Board last week, the reviews are to cover the staffs of boards and management committees and the administrative and clerical, medical and dental, nursing, and domestic staffs of the hospitals themselves Boards and management committees are being invited to associate with the visiting groups any of their members and officers they may wish, and each of these groups, when reporting to the Minister, will put before him the views of the board or committee The Minister will then decide the establishment, and hospital authorities will be required not to exceed this without first gaining the consent of the Minister in the case of staff appointed by boards, or of the board in the case of staff appointed by management committees

ANTI HISTAMINE DRUGS AND THE BLOOD

NO ONE familiar with the composition of the anti histamine drugs will be surprised to learn that they can cause toxic reactions in the blood and blood forming tissues As early as 1945 Clement and Godlewski[1] reported agranulocytosis in a girl, aged 13½, who had had 3 weeks' treatment for asthma with a drug resembling tripelennamine hydrochloride ('Pyribenzamine') Since then this complication has been described in four cases after hydrochloride,[2] in one (fatal) after mepyramine,[3] and in one following the administration of metaphenilene hydrochloride ('Diatrin')[4] This last case was in a man of 81 who was given the anti histamine drug for chronic nasal congestion, the dose was not excessive—50 mg every 8 hours—but when he attended his doctor after having taken the drug for some 6½ weeks he was pyrexial and had a leucocyte count of 3600 per c.mm, with no polymorphs, 99% lymphocytes, and 1% monocytes He was given penicillin, streptomycin, and blood transfusion, but it was 5 days before any granulocytes appeared in the peripheral blood, eventually he was none the worse for his experience Drake[4] noted that the anti histamine drugs that had caused agranulocytosis all contained the benzamine linkage <⬡>—N< and he pointed out that this group had been incriminated by Kracke in amidopyrine, which has a reputation for causing agranulocytosis Some of the anti histamine drugs, such as diphenhydramine ('Benadryl'), do not contain this dangerous group, and no case of agranulocytosis has so far been reported after their use However, diphenhydramine has its own dangers, for Crumbley[5] has described three cases of hæmolytic anæmia following its long continued administration

Anti histamine preparations are used for long periods chiefly in the treatment of asthma, hay fever, and some chronic skin diseases These reports are a warning but, considering the widespread use of these drugs, especially in the U S.A. where they are freely obtainable by the public, serious toxic reactions seem to be rare In this country anti histamine substances may be had only on a doctor's prescription—a precaution envied by some American physicians

1 Clement, R Godlewski S *Bull Soc Hôp Paris* 1945 61, 103
2 Blanton W, Owens M. *J Amer med Ass* 1947, 134 454 Hilkor, A.W *Ibid* 1950, 143 741 Martland H S jun Guck, J K *Ibid* p 742 Cahan A M, Meilman E Jacobson B M *New Engl J Med* 1949 241 865
3 Roos G *Pr méd* 1950 58 448
4 Drake, T G *J Amer med Ass* 1950 142 477
5 Crumbley, J J *Ibid* 143 726

HORMONES AND PROSTATIC CANCER

ŒSTROGEN therapy of carcinoma of the prostate has been practised for less than a decade This is too short a time for final assessment of a cancer treatment, but it is long enough for an interim review Nesbit and Baum[1] describe a five-year trial of œstrogen therapy in 1818 cases at a number of American centres Some patients were treated with œstrogens alone (in doses equivalent to 1–5 mg diethylstilbœstrol daily), some by orchidectomy alone, and some by a combination of both methods Control figures are provided by a series of cases which had no treatment Judged by survival rates, hormone therapy was better than no treatment at all, but administered hormones alone were never so effective as orchidectomy alone, and usually the best results were obtained with a combination of the two In cases without metastases this combined therapy gave a five year survival rate of 44%, with orchidectomy alone the percentage was 31, and with œstrogens alone 29, only 10% of the controls survived The presence of metastases heavily weighted the scales against success, in these cases the corresponding survival percentages were 21, 20, 10, and 6 In the symptomatic treatment of relapse, ringing the changes often brought a measure of success Here also orchidectomy seemed more effective than administered œstrogens, but the difficulty of assessing and comparing symptoms undermines the value of this conclusion The results over the whole series vindicate the belief that hormone treatment of prostatic cancer can prolong life

RADIOTHERAPY OF ANKYLOSING SPONDYLITIS

SUCCESS in the treatment of ankylosing spondylitis depends on early and accurate diagnosis, but the symptoms may be so slight that the doctor is not consulted until years after the onset—even the patient with a completely rigid spine may recall no more than twinges of "rheumatism" or "fibrositis" Then the disease can assume many guises In a youth with fever and joint pains it is likely to be labelled acute rheumatism Reiter's syndrome accompanying spondylitis will strongly resemble gonorrhœal urethritis and arthritis, and pain referred to the thorax or abdomen may lead to confusion with cardiac or pulmonary infarction, appendicitis, and the like It follows that spondylitis should be considered in patients with a wide variety of symptoms, and where it seems a possible diagnosis the examination should include toe touching with extended knees, chest expansion, and X ray films of the sacro iliac joints

The outlook for these patients may be vastly improved if 'Cortisone,' A C T.H, or some effective substitute becomes plentiful, for the disease responds to these drugs as strikingly as does rheumatoid arthritis[2] Meanwhile, radiotherapy is the mainstay of treatment, and in most cases it will rapidly relieve the pain The wide field technique[3] has been largely superseded by heavier dosage to a relatively small area, and though only the sacro iliac joints are diseased most radiotherapists now treat the whole spine as well, because it almost always becomes involved later The back is divided into areas which are irradiated separately the sacro iliac joints form one area, and the cervical, dorsal, and lumbar spine three or four, according to the patient's build The precise dosage does not affect the results. At the Rheumatology Unit of the Royal Free Hospital a skin dose of 1200 r at 220 kV is given to each area in eight treatments spread over four weeks A rather smaller skin dose is applied to any peripheral joints involved The patients are admitted to the wards for this treatment, at any rate in the earlier stages, and they receive a high-calorie diet with abundant vitamin and iron, and weekly liver injections A blood count is done every week, and a fall in hæmoglobin below 11 0 g per 100 ml is an indication for blood transfusion Thus the fatiguing and debilitating effects of X ray treatment are largely avoided The patient rests and sleeps on a mattress made flat and unyielding by fracture boards To mobilise the costovertebral joints, he is given exercises which encourage costal breathing, while diaphragmatic movement is discouraged by manual pressure over the epigastrium The spine is kept extended and kyphosis corrected by the "weight and counterweight" method[4] in which the patient is suspended, face upwards,

1 Nesbit C M Baum W C *J Amer med Ass* 1950 143 1317
2 Boland E W Headley N E *J Amer med Ass* 1949 141 301 Boland E W *Ann rheum Dis* 1950 9 1 Freyberg R H *Bull N Y Acad Med* 1950 26 206
3 Scott, G Adolescent Spondylitis London 1942
4 Guthrie Smith O F Rehabilitation Re-education and Remedial Exercises London, 1943

from overhead bars by a canvas sling under his dorsal region, and his neck, arms, and legs are supported by spring slings, this arrangement allows him to extend his neck and limbs with the assistance of gravity but against the pull of the springs, which can be varied to suit each case

The common complications of spondylitis are iritis and respiratory infections The virus infections can be particularly troublesome, and radiotherapy seems to activate them, here 'Aureomycin' will often be of great value In women, irradiation of the sacro iliac joints carries a heavy risk of subsequent sterility, for the usual X ray dose given to the ovaries to produce an artificial menopause is only 600 r Even when the hip joints are treated with X rays there is likely to be at least a temporary amenorrhœa At the Royal Free Hospital the sacro iliac joints are never irradiated in women of child bearing age

FAILURE AT SHEFFIELD

PLANS were well advanced in Sheffield for turning a modern local authority clinic into a health centre But the city council is unable to proceed with these plans because, after lengthy negotiation, the executive council can give no assurance that general medical practitioners will be available to staff the centre This disappointing and regrettable conclusion sets back the chances of early health-centre experiments in industrial areas No shortage of money or building materials was the difficulty here, for the clinic building lent itself to inexpensive but adequate adaptation The opportunity was lost through failure to find ways whereby the doctors already practising nearby could be reconciled to the changes, in their customs and in their relationships with their colleagues, which they feared might follow the implantation of a health centre in their midst

The Collings report[1] rightly urged that the highest priorities, both medical and economic, should go to improving conditions of medical care and professional life where they are worst—in crowded urban areas So far this object has been defeated wherever it has been attempted, and for the moment it looks as though the only chance of our generation seeing group practice from health centres is to place them in new towns or on new housing estates and staff them with doctors who have no local interests to reconcile or animosities to forget But the results of experiments of this kind, made under ideal conditions, would have only limited relevance to practice as it really is At bottom, improvement in the professional life of practitioners depends on their willingness to coöperate, and the Sheffield decision provides more ammunition for those who hold that real progress will be impossible so long as there is competition for patients

REMUNERATION DISPUTE

BECAUSE the claim for better remuneration of general practitioners remains unsettled, all such practitioners taking part in the National Health Service are being asked by the British Medical Guild to sign a form of resignation. These forms will not be handed in to executive councils unless 80% of practitioners express willingness to withdraw, and the decision whether or not to attempt this mass withdrawal will be made by the Conference of Local Medical Committees in December by which time the results may be known of investigations into (1) the total remuneration received by practitioners in the year ended March 31, 1950, and (2) the percentage of income which practitioners pay in expenses The decision to plan for withdrawal was taken by this conference last June and was endorsed by the Representative Body of the B M.A. at its annual meeting[2] At the latter meeting Dr S Wand, chairman of the General Medical Services Committee, declared that the important thing is that the betterment factor (on gross income) should be increased from 40 to 70%—an adjustment estimated to cost about £7 million per annum If notices of resignation are handed in, the Minister of Labour must be informed that a dispute exists and he may then refer this to compulsory arbitration.

ON Oct 11 the fee payable to the General Medical Council for first registration under the Medical Acts was raised to 11 guineas The council was authorised to increase this fee under the Medical Act 1950 The fee for the registration of additional qualifications, including diplomas in public health, has not been raised

1 *Lancet* 1950 i 555
2 See *Lancet* July 8 1950 p 61
3 *Ibid* July 22 1950, p 148

Special Articles

EFFECTS OF CORTISONE IN THE RHEUMATIC DISEASES

DR HENCH'S LECTURE

ON Oct 5 Dr PHILIP HENCH, of the Mayo Clinic, addressed a meeting of the Windsor Medical Society at the Special Unit for Juvenile Rheumatism, Canadian Red Cross Memorial Hospital, Taplow, Bucks The following is a summary of what he said

RHEUMATOID ARTHRITIS

Two years ago, at a meeting of the Heberden Society, I spoke of the potential reversibility of rheumatoid arthritis, and now this possibility has been realised by 'Cortisone,' which can cause marked relief of symptoms in a few days in 95% of treated cases Maximum subjective improvement occurs in up to 8 days, maximum objective improvement in up to 3 weeks, and maximum over all remission of the disease in all its clinical and biochemical aspects in 2–3 months

The patients' strength, appetite, body weight, and mental and physical activity improve rapidly There is a sense of well being, sometimes amounting to euphoria Fever usually disappears Rheumatoid nodules shrink and may become impalpable An analysis of flexion contractures shows that 68% disappear in 3–21 days and 32% improve, according to the previous degree of fibrotic change Even contractures of 2–3 years' standing have completely gone, and physiotherapy may complete a partial cure by cortisone The responses to second, third, and fourth courses of cortisone are essentially similar When treatment is discontinued symptoms return in 2–4 weeks, but not in all cases The over all results are as follows disappearance of over 90% of symptoms in 60% of cases, disappearance of 75–90% of symptoms in the rest—except in a very few severe cases where there is only moderate improvement

There is a parallel reversal of laboratory findings The sedimentation rate will become normal if treatment is continued long enough, but it should be noted that with cortisone, though not so much with A.C T H, there is up to 9 days lag before treatment or its withdrawal is reflected in a change in sedimentation rate With cortisone and especially with A C T H the numbers of circulating lymphocytes and eosinophils are reduced, although with long periods of administration of cortisone this effect is decreased The 17 ketosteroids are increased by A C T H and reduced by cortisone, while the 11-oxysteroids rise with both The serum protein and the hæmoglobin are unaltered The plasma-electrolyte pattern does not show great changes unless courses of 200 mg a day, or more, are given for over a week. In such cases the blood bicarbonate percentage rises and the ionised potassium may fall to between 8 and 14 mg per 100 ml, whilst the chlorides may fall to less than 550 mg These changes seem much less common when patients are allowed unrestricted diet Serial biopsies of synovial membrane show improvement consisting in decrease in the cellular reaction and numbers of plasma cells and lymphocytes and in less fibrin deposition, less necrosis, and less œdema However, in no case of rheumatoid arthritis so far studied has there been a complete reversal of the histological picture to normal

RHEUMATIC FEVER

Rheumatic fever and rheumatic carditis present a different problem One can imagine a hypothesis in which the susceptible rheumatic subject, sensitised by unknown inherited or environmental factors, develops what may be called the 'latent rheumatic state" The latent rheumatic state, plus the presence in the body of the unknown irritant produced by the hæmolytic streptococcal infection of the throat, react to give the clinical attack of rheumatic fever This reaction is in two parts The first part is exudative, with inflammation, œdema effusions into synovial cavities, and fever It is relatively unimportant The second is proliferative, with cellular infiltration, and later fibrous tissue formation in the sites of rheumatic nodules and in the connective tissue of the heart and its valves Unless cortisone can suppress this proliferative reaction as well as the exudative, it is of no more use than aspirin That it can do so is not proved but probable, for the following reasons Firstly, the granulation tissue of rheumatic carditis is similar to that producible in experimental animals and to that of rheumatoid arthritis both of which are known to be suppressed by cortisone

Secondly, certain significant cardiac murmurs have been reported by Massel et al to have disappeared under treatment And thirdly, in the short follow up studies so far available, new murmurs indicating fresh carditis have not appeared, and there has been no significant change in established murmurs But it must be stressed that a much longer follow up time, 2–3 years, must elapse before judgment can finally be made

There are good reasons for believing that the average duration of the latent rheumatic state is between 6 and 12 weeks Under the influence of A C T H or cortisone the latent rheumatic state and the unknown irritant are still present, though symptomless, for 6–12 weeks If these hormones are given until the end of the period of the latent rheumatic state, no withdrawal relapse occurs If the hormones are withdrawn before, then a relapse will occur which will last until the natural end of the latent rheumatic state It must be emphasised that rheumatic fever is not "cured" the duration of the latent rheumatic state is not shortened, and subsequent recurrences are not prevented by cortisone The hope for the future lies in giving cortisone to suppress the body's reaction during the latent rheumatic state, and in the oral penicillin chemoprophylaxis of streptococcal infections in susceptible subjects

OTHER FORMS OF ARTHRITIS

Other forms of arthritis have been treated Of patients with osteo arthritis 50% have shown satisfactory responses Symptoms of acute gouty arthritis are rapidly suppressed, although they may relapse on drug withdrawal Chronic gouty arthritis shows little structural change, despite symptomatic improvement, and tuberculous arthritis, though symptomatically relieved, continues to show active tuberculosis and positive culture in biopsy material from the affected joint

SIDE EFFECTS

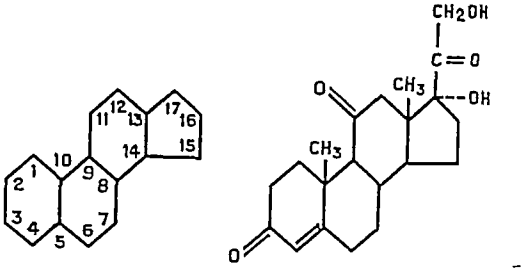
These powerful hormones, if given for long enough may produce undesirable side-effects Females, especially menopausal or adolescent, show more than males Side effects are rare in diseases such as acute gout or acute rheumatic fever controllable by short courses of treatment, but are more common in patients receiving long continued treatment for chronic disease such as rheumatoid arthritis The first treated cases of this disease received rather large doses and about 25% showed significant side effects In the current series the incidence is about 8%, mainly because lower maintenance doses of about 65 mg or less daily are used Minor side effects such as euphoria and rapid mood swings are common and of little significance Rounding of the face, œdema of the legs, acne, hypertrichosis, and striæ distensæ occur occasionally but rarely interfere with treatment Few side effects present emergencies, most develop slowly and can be detected early by close observation but a few demand special attention Excessive salt and water retention may add dangerously to the load on an already failing heart Patients who are also diabetic show a decreased carbohydrate tolerance and require less insulin Major psychotic changes have occurred but are rare, and are believed to be due more to a pre existing psychotic personality than to treatment Osteoporosis in the elderly, combined with suddenly increased muscular activity, may lead to spontaneous fractures

SUBSTITUTE FOR CORTISONE

In the hope of finding a drug cheaper, safer, and more easily available than cortisone, over 50 closely related steroids and many adrenal extracts have been tried None, except compound F, has been found to possess antirheumatic activity in our hands, or in the hands of critical rheumatologists experienced with cortisone This includes pregnenolone, delta 5 pregnenolone and desoxycorticosterone with or without ascorbic acid Several of these compounds differ only in one particular from cortisone As a result, we can say that the antirheumatic properties depend on

(1) A ketone group at C 3
(2) A double bond between C 4 and C 5
(3) A ketone or hydroxyl group at C 11
(4) A hydroxyl group at C 17
(5) A ketone group at C 20
(6) An hydroxyl group at C 21

In the absence of an effective substitute for cortisone we must learn to obtain the maximum desirable with the fewest unwanted effects Some preliminary successes have been obtained in this direction. Rounding of the face acne,



17 hydroxy 11 dehydrocorticosterone (Compound E)

hypertrichosis, and "buffalo hump" can be controlled by 10 mg of œstrogens per week Œdema and fluid retention often disappear spontaneously if hormone treatment is continued, but can if necessary be controlled by diuretics, by potassium chloride 6 g per day, and by a restricted salt and fluid intake Undue nitrogen loss, less common on unrestricted diets, can be controlled by 25 mg of testosterone each day Psychotic manifestations may require temporary interruption of treatment, or, sometimes stronger measures such as shock therapy We must learn to coöperate with, rather than dominate or supplant, the functions of the pituitary adrenal system

METHODS OF TREATMENT

Various plans of administration have been used No plan yet emerges as consistently the best In one plan treatment is given in full doses for short courses of up to 3 weeks which are abruptly begun and abruptly ended, and repeated when symptoms recur This has the advantage that the physician knows what is happening to the disease process underneath the hormonal suppression, and occasionally a relapse of the disease has not occurred for many months after treatment ceased But patients, once freed of their disease, tolerate very poorly even its partial return, and have great difficulty readjusting themselves A second plan gives fully suppressive doses during a short initial period, followed by maintenance doses gradually reduced to a minimum which prevent recurrence This saves the patient from the misery of recurrences but is costly and requires close supervision Even a change in dosage from 50 mg a day to 100 mg on alternate days may need careful management A third plan alternates courses of cortisone with courses of A C T H In theory this should produce less secondary suppression of the adrenal or pituitary glands

THE FUTURE

There are many promising new developments under way Briefly, these are the improved methods of producing cortisone and A C T H, the development of long acting A C T H and the development of A C T H. peptides, the potentiation of cortisone with insulin, the production of radio actively labelled cortisone and its use in research, the development of compound F (which has as yet not been successfully synthesised), and the studies on oral cortisone

In conclusion, it should be added that at the Mayo Clinic these hormones are not yet used in routine treatment But one cannot remain academically aloof to the millions of arthritic patients who ask "Can we get the hormones as a safe treatment, and if so, how soon?" Many investigators believe that these drugs can now be released for practical application in conditions requiring relatively short term treatment The price of cortisone has already fallen from 1000 dollars to 50 dollars a gramme, and it is now available in every large American hospital In the management of chronic diseases, and especially in rheumatoid arthritis, current investigations may reveal the limits of its usefulness Much remains to be learnt, but a satisfactory beginning has been made through the correlated efforts of many investigators in many branches of science Whatever the destiny of these hormones in practical therapy they demonstrate clearly the reversibility of certain disease processes formerly regarded as relentlessly progressive, and in particular they are powerful tools with which we can investigate many problems of ætiology and treatment in a wide variety of diseases

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In England and Wales notifications of poliomyelitis during the week ended Oct 7 were paralytic 241 (222) non paralytic 112 (109) total 353 (331) Figures for the previous week are in parentheses In the week under review non paralytic cases formed 23 5% of the total

From Letters to the Editor

Propagation of the Unfit—In the lecture published on Sept 30, Professor Penrose restates his ingenious thesis that our population is largely self regulating for its genetic endowment for intelligence The relatively heterozygous individuals of about average intelligence have, he suggests, a naturally higher fertility than the more homozygous intelligent and dull individuals If this is correct, then not only is a high net fertility of the dull of little lasting importance, but also any eugenic plans for achieving a fairly rapid rise in the average genetic endowment of the population for intelligence will be frustrated by the infertility of the intelligent In so far as net fertility is under social control it will, however still be possible to some extent to maintain the average level above that to which it would naturally revert, by measures to raise the net fertility of the intelligent to its maximum and to depress further the fertility of the dull One might argue that at the moment the reverse process is occurring from incomplete data it seems that the highest net fertility lies with a group whose intelligence is well below the average

But before accepting Professor Penrose's thesis, however attractive its theoretical basis, one would like to have the nature of the reduced net fertility of the dull and the intelligent demonstrated There are figures from America (Indianapolis survey) which imply that differential fertility in relation to economic status depends almost entirely on the relative success with which family size is planned, there was little difference in the degree of fecundity or the size of family desired, but considerable variation in the number of unplanned pregnancies Obviously psychological factors are responsible for causing social classes 1 and 2 as well as the more intelligent in other social classes in Great Britain to plan the size of their families at well below replacement level, but it seems likely that these psychological factors are determined more by environment than genes Further, we cannot be sure that these psychological factors are any less strong in the rest of the community until they too are in a position to plan the size of their families effectively My own guess is that when we have an easy foolproof method of controlling conception which does not offend religious or æsthetic susceptibilities, the present differential fertility in relation to intelligence will disappear I do not think that we shall then find either dullards or psychopaths deliberately choosing to have large families and I shall be surprised if there is not ample fecundity available to make it worth while to encourage parents who are likely to produce children well adapted to life in a social democracy, to have large families—C O CARTER, M.R C.P (Orpington Kent)

The Food We Eat—There is much to support the suggestion by Dr Ffrangcon Roberts (Sept 30) that a change is taking place in our feeding habits which may be having physiological as well as social consequences Rationing has probably expedited a social trend apparent before the war—nowadays the popularity of snack bars is obvious Carbohydrate with a relish of some kind unfortunately forms the basis of most snacks, in fact, these are strikingly similar to the meal of the Oriental whose diet is notoriously deficient in fat and first class protein—a circumstance believed to exert a profound effect on national vigour

In days gone by, most artisans started the day with a breakfast in which pork figured largely The midday meal was usually of the packed variety and though simple, was of a nutritional quality now hard to achieve In the evening a third meal was taken Today, for breakfast many get hardly anything at all, or hurriedly eat a cereal little wonder that tea breaks and other interruptions are frequent Often these interludes are decried but probably they reflect an unconscious desire to satisfy physiological demands Break privileges may be abused and restrictive practices may be in operation but here I am concerned only with the medical side

Anyone who has observed, or worked with men doing continuous work of one kind or another recognises that in recent years despite a will to work staying power has deteriorated In the evening an insidious fatigue seems to bring activities to a close whereas in the past overtime would willingly have been worked—and sometimes particularly in rural areas still is—not necessarily for the pecuniary reward but for the satisfaction a completed task gives The extra rations granted to certain manual workers is an official admission that something additional is needed but somehow in practice the desired end is not achieved When a man decided for himself the diet which best suited him in his work he could get it Popular exhortations to increase production may prove more effective when the protein bait is something more than an extra piece of cheese—W R THROWER M R C P (London, W 1)

Hazards of the Aged Hip—Your leading article of Sept 30 draws attention to a matter of increasing importance At Worcester Royal Infirmary, which serves a population of 150,000 we have in seven years admitted 120–130 of these cases, of which 116 have been treated by open operation and some form of nail or nail plate From 1944 to 1949 we averaged about 14 cases a year, but this year we have already operated on 30 in nine months Every case is considered a justifiable risk for operation unless the patient is moribund after observation for three or four days While it is agreed that traction alone is suitable for the trochanteric types of fracture we are driven by shortage of staff and beds to prefer operation in order to ease the nursing of these patients and to get them ambulant on crutches and out of hospital at the earliest possible moment The average stay in hospital under this régime is about three weeks and the operative and post operative mortality is negligible—possibly 1 or 2% Though accurate figures have not yet been worked out, my impression is that 60–70% of our cervical fractures achieve bony union. Non union, due to interference with the blood supply and aseptic necrosis of the head, is an unsolved problem for the remaining 20–30% For cervical cases with non union, a McMurray type of osteotomy after removal of the nail gives excellent results, though this condemns the patient to a tedious three months or longer in a plaster spica and adds to the burden of nursing Trochanteric fractures fixed by a Capener or McKee type of nail plate seem always to unite quickly—NORMAN DUGGAN, F R C S (Worcester Royal Infirmary)

Theory of Barbiturate Action—Dr Dalton's speculation (Oct 7) is difficult to reconcile with the fact that, with all barbiturates so far tested anæsthesia results in an *increase* in the acetylcholine content of brain (Tobias J M, Lipton, M A, Lepinat A A *Proc Soc exp Biol, N Y* 1946 **61**, 51 Richter D, Crossland, J *Amer J Physiol* 1949, **159** 247 Crossland, J Unpublished observations) This effect is regarded as secondary to the decrease of nervous activity during anæsthesia, since a similar, though smaller, increase is found during natural sleep (Richter and Crossland 1949) Such a decreased liberation of acetylcholine, rather than reduced synthesis, is the more probable explanation of the finding of Velazques and Elio Membrado that the amount of acetylcholine in the cerebrospinal fluid (C S F) of dogs is reduced during anæsthesia (*Farmacoterap actual, Madrid*, 1944 **1**, 28) Conversely the finding by Tower and McEachern (*Canad J Res* 1949, **E27** 120) that in cases of epilepsy acetylcholine often appears in the C S F in amounts depending on the frequency of the seizures, is likely to be explained by increased release of acetylcholine since there is little evidence to associate epilepsy with accelerated synthesis of this substance by the brain—J CROSSLAND, M A (Neuropsychiatric Research Centre, Whitchurch Hospital, Cardiff)

Enuresis and Hypersomnia—Dr Ström Olsen has suggested (July 22) that in adults enuresis and hypersomnia constitutes a syndrome of central origin but he hesitates to claim that a similar syndrome is to be found in children (Sept 30) I have shown that in some cases of enuresis there are uninhibited contractions of the bladder which do not reach consciousness and which may to some extent be inhibited by drug treatment (*Ann R Coll Surg* 1949 **5**, 5) Such has been the rationale of treatment with ephedrine and even with belladonna but perhaps we have too often assumed that any benefit is due to the local action of these substances In patients benefited by this treatment the structure and function of the bladder are so often normal that the effect is probably due to the drug's stimulating and sleep diminishing effect The greatest advance in the treatment of true functional enuresis has been the introduction of Dexedrine Bearing in mind that one in three cases of enuresis coming to hospital has some organic factor, among the remainder the cure rate is very high when dexedrine is used in conjunction with ordinary toilet training Hypersomnia enuresis and bad school reports go together and often disappear together—D F ELLISON NASH, F R C S (London, W 1)

Tuberculin Surveys —Dr Hounslow and Dr Macdonald have asked, in their letter of Oct 7, if there can be any advantage "in delaying further a major investigation into the level of tuberculisation of our own population" A large scale tuberculin survey covering 22 different areas in England and Wales was organised recently by the Medical Research Council with the active coöperation of the staff of many local health authorities and regional hospital boards Nearly 100,000 children and young people between the ages of 5 and 20 were tuberculin tested, and the results are at present being analysed —M DANIELS, M R C P, secretary, M R C Tuberculin Survey Committee (Medical Research Council Laboratories, London, N W 3)

No Tools —Under this heading (Sept 23) you do scant justice to the public health authorities At the time of the inauguration of the dispensary scheme the sanatorium alone had proved a failure—and, owing to the adoption of graduated work, a danger The same could be said of tuberculin treatment Little or nothing had been said about the value of rest But in the counties of Rutland and Peterborough the surprising value of rest was made known to the public by the war cry "take away his trousers and his lungs will look after themselves," and as far back as 1915 this was elaborated by my undertaking artificial pneumothorax treatment in the patient's home My first patient lived for over twenty years, the second is still alive, and over 40 were so treated without requiring sanatorium treatment It goes to prove that elaborate buildings are not needed It will be years and years before additional sanatoria can be built, and meanwhile a very large proportion of chest cases could be treated in their homes or in open air shelters adjoining their homes —CHRISTOPHER ROLLESTON, M R C P (Kotton, Stamford, Lincs)

Incidence of Sprue Syndrome —In collaboration with Dr J R Fountain I published (*Brit med J* 1950, i, 1157) an ætiological study of some 2000 cases of the sprue syndrome (tropical sprue, idiopathic steatorrhœa, and cœliac disease) who received priority rations between 1943 and 1948 We produced evidence that the syndrome might be conditioned by a genetic factor which may be accentuated and brought to light by a variety of environmental agents The rarity of the syndrome (one case of idiopathic steatorrhœa per 700,000 population over 15 years of age, and one case of cœliac disease per 135,000 population below that age) makes it unlikely that any individual will see sufficient cases to throw additional light on the ætiological importance of the genetic factor I am therefore appealing to medical men in all parts of the world to help in this investigation by sending me any information regarding two or more cases of the syndrome in a single family I should also be grateful for information which would help to answer the question "What happens to children with cœliac disease?"—i e, what percentage die, recover, or appear in adult life as cases of idiopathic steatorrhœa?—Prof L S P DAVIDSON, F R C P (Department of Medicine, University of Edinburgh)

Status of Tuberculosis Workers —Workers in tuberculosis will be dismayed by the Ministry of Health's announcement concerning the posts that may suitably be filled by senior hospital medical officers It appears that, under this ruling, doctors who have specialised for years in this field will very seldom be able to attain consultant rank In particular those who choose to remain in chest-clinic work are unlikely to be eligible for consultant status This decision follows discussions with professional bodies, and it is difficult to avoid the conclusion that not only the Ministry of Health itself but also consultants in other branches of medicine are determined to maintain the degraded position of the tuberculosis service It was hoped that, with the advent of the N H S, this position would be radically altered and all doctors who had made a single specialty their life work would be considered on equal terms according to individual merit Here, however, we have the singling out of a specific branch of medicine (among others, such as geriatrics and infectious diseases) as a specialty in which, whatever one's personal achievement, the likelihood of consultant grading is remote With the present shortage of beds and the increase in responsibility falling on the chest clinic physician and his staff, the decision is extremely short-sighted Tuberculosis today forms the greatest problem facing the health service, but until tuberculosis workers are given the recognition which their work and responsibilities demand, there is little hope of drawing the best men into this work —PETER STRADLING, M R C P, consultant chest physician, Hammersmith, London

In England Now

FRIDAY morning used to be one of unalloyed pleasure I would get up at leisure—my hospital round is later than on other days—and enjoy an idyllic breakfast ploughing steadily through the *Lancet* and the *Times*, with a final glance at the *New Statesman*, as I munched my toast and marmalade With careful timing I could get down just after the children left for school but before the breakfast things were cleared away Then all was changed, simply because your newborn contemporary, the *E-gle*, also comes out on Fridays. I tried every expedient, even telling our newsagent to hide in the bowels of the *Times*, but it was no use, the childr always got there first, and they would either whisk the pap off to school, without allowing me so much as a glimpse Dan Dare, Spaceman of the Future, on Vénus, or add insu to injury by shrieking a brief synopsis as they flashed b Life seemed bleak indeed until I hit on the device of beginnin my Friday's round in the children's ward Every chi seems to have a copy, and I can comfortably get through th week's instalment as I pause at each bedside to pass the tim of day or palpate an abdomen I'm afraid the unwonte sparkle in my eye has given me away and my stock has gon down with the nurses, but the few children who have tumble to it now greet me as one of the Initiated—a fellow spac traveller

* * *

The vast physiology theatre at the medical school wa crammed to the roof for the first meeting, on Oct 4, of th reconstituted Manchester Medical Society Mr Wilson He the president, traced the history of Manchester medic societies from the late 18th century, and the Lord May commented without surprise on the number of occasions th doctors forgathered on licensed premises As president the Royal Society of Medicine, Lord Webb Johnson presente Mr Hey with a document conveying the society's goo wishes, the Vice Chancellor hoped that the society woul help to bridge the growing rift between specialist and gener practitioner, Prof Hilda Lloyd suggested that Manchest had more or less founded the Royal College of Obstetrician and Gynæcologists, and blessings were pronounced by Si Cecil Wakeley for the Royal College of Surgeons, by Prof Crighton Bramwell for the Royal College of Physicians, and by the president of the Liverpool Medical Institution

Over 600 people went to the reception in the Whitworth Art Gallery in the evening Those of them who hoped tha the society would be re launched with champagne might hav thought differently if they had known how hard the treasure found it to pay for the light refreshments

* * *

Most of the pituitary glands of American cattle find their way into the processing plants of a great commercial laboratory whence they emerge in part as A C T H But I was perturbed to find that this firm seems to claim a controlling interest in the human hormone in vivo, for one of its publications refers to the "alarm reaction" as the sudden and marked endogenous A C T H (Armour) stimulation of the adrenal gland during environmental stress Must we pay royalties to the U S every time we get into trouble? If so, financial stress will create a vicious spiral

News

As part of the general settlement of the salaries of hospital nursing and midwifery staff, agreements have been reached by the Nurses and Midwives Whitley Council for revised rates of pay for departmental sisters superintendent male nurses night sisters night superintendents sister/male tutors assistant matrons, deputy matrons and matrons in hospitals other than mental hospitals mental-deficiency institutions and maternity hospitals and homes (N M C (50) 8) New rates have also been fixed for superintendent and deputy superintendent nurses (now graded as matrons and assistant matrons) working in National Assistance institutions which have beds for the chronic sick

On Oct 12 the honorary medal of the Royal College of Surgeons of England was presented to Lord Webb Johnson for his many generous acts and continued labours in the interest of the college during his eight years of presidency

The National University of Ireland has conferred the honorary degree of D.SC on Dr Philip S Hench and Mr E C Kendall D SC of the Mayo Clinic Rochester Minnesota In recognition of their contributions to medical and biochemical research with particular reference to their work on Cortisone

Lord Nuffield has been elected president of the British Rheumatic Association

The Rockefeller Foundation has made grants of over £20 000 for studies in London Cambridge and Bristol in human heredity, anthropology and anatomy

Television has been successfully used in Philadelphia for the long range examination of X ray films According to B U P the image is in some respects better than the original

The annual meeting of the British Orthopædic Association will be held at Friends House Euston Road London N W 1 on Oct 26 27 and 28

Speaking at the annual conference of the National Smoke Abatement Society held last month at Margate Dr J S G Burnett M O H for Preston described instances of increased mortality in this country which had followed smoke fogs But apart from these periods of limited and heavy pollution there was always some pollution in the air which had harmful effects over long periods Mr R E Waller who is working in the pathology department of St Bartholomew's Hospital said that examination of town smoke had shown that cancer promoting substances were always present in trace amounts Mr D T A Townend D Sc director-general of the British Coal Utilisation Research Association gave the first lecture named after Dr H A Des Vœux the founder of the society

The professional nurses and midwives conference held each year under the auspices of the *Nursing Mirror* will take place from Oct 23 to 27 at the Seymour Hall Seymour Place London W 1 Viscount Addison will preside and the speakers will include Prof Hilda Lloyd, P.R C O G and Sir Cecil Wakeley P.R C.S

A *Handbook for General Medical Practitioners* which is being issued by the Ministry of Health to doctors on the lists of executive councils provides comprehensive information about the operation of the N H S as it affects the practitioner

CORRIGENDUM *Treatment of Fibrositis with Adrenaline, Ephedrine and Belladonna Creams* —In Dr Howell s article of Sept 23 (p 395) the formula for the ephedrine cream should read Ephedrine hydrochloride 1 part, emulsifying wax 20 parts, wool fat 10 parts chlorocresol 0 05 part water *to* 100 parts

Births, Marriages, and Deaths

BIRTHS

DAVIDSON —On Sept 21 at Anstruther the wife of Dr W G Davidson—a son

FIGGIS —On Oct 9 the wife of Dr M M. Figgis—a daughter

ROBINSON —On Oct 13 at Danby Yorks the wife of Dr Robert Robinson—a son

RODGER —On Sept 28 the wife of Dr D E Rodger—a son

ACADEMIC AND EDUCATIONAL

Empire Rheumatism Council Postgraduate weekend course at Apothecaries Hall Nov 17–19 Fee 2 gns with application to Gen Secretary, Tavistock House (N), Tavistock square, W C 1

Institute of Orthopædics Course in diagnostic and prognostic methods in orthopædics Nov 6–11 Fee 7 gns Apply Dean 234 Great Portland street, W 1

Institute of Ophthalmology W C 1 Sr Lecturer in Bacteriology with experience of virus work (£1250–£100–£1750) Apply to Secretary (closing date Nov 10)

London University Research Grants for materials and apparatus Apply Secretary Central Research Funds Committee Senate House, W C 1, by Nov 30

Birmingham University Chair of Obstetrics and Gynæcology (£2250–£2750, eligible for distinction award) Apply to Secretary (4 weeks)

Glasgow University Jr Asst Department of Midwifery Apply to Secretary (closing date Nov 11)

Liverpool University George Holt Fellowship in Physiology Gastro-enterology research Medical and Science graduates apply to Registrar

Hospital for Sick Children W C 1 Research Fellowship for Pathologists to investigate Malignant Disease in Childhood Tenable 1 year (£1000) Apply to Morbid Anatomist

Newcastle upon Tyne R H B Fellowship for survey of children s accommodation General Mental, and Mental-deficiency hospitals (£1300) Apply to S.A M.O (28 days)

St Andrews University Professor of Surgery, in Senior Medical School, Dundee (£2750) Apply to Secretary (closing date Jan 15)

LIST OF HOSPITAL VACANCIES

(*Further particulars of appointments available on request to Advertisement Manager*)

Albert Dock Orth & Frac E 16 —Reo Room O

Belgrave for Children S W 9 —Res H O

Bearstead Mem N 16 —Res Obst M.O (H O) Res Obst M.O (H O) Hampton Court

Brompton S W 3 —3 H P.s (non res)

Children s S E 26 —Res M.O (H O)

Hammersmith West London & St Mark's —Reg (rheum)

Hampstead Gen N W 3 —H P H.S, Cas O

Hosp for Sick Child W C 1 —Orth. Reg (part-time) O P Dept

Hosp of St John & St. Eliz —Surg Reg (Male)

London E 1 —Sr Reg (thor surg)

London E 1.—Sr Reg (obst & gyn)

London Clinic W 1 —Res H O (med)

Memorial S E 18 —H.S (gen surg gyn & obst)

Memorial S E 18 —H.P C O (2nd or 3rd post)

Middlesex W 1.—Reg (dis nervous system) Med Reg

Mile End, E 1 —Res Jr Gyn & Obst Reg

North Middlesex, N 18 —Sr H.S (gen & thor surg) H.P, H. Anæs

National for Nervous Diseases W C 1 — Asst. Clin Path (Sr Reg)

Nat Hosp Nervous Diseases W C 1 — Asst. Reg (O.P Dept) Sr Reg

N E Met R.H.B —Med Reg (Whipps Cross) Reg (path) N Middlesex

N W Met R H B —Reg (T.B) Chest Clinic

N W Met. R H B —P t Ophth Surg (Royal Northern)

N W Met R H B —Sr Reg (Hampstead Chest Clinic)

Paddington, W 9 —Sr Reg (med)

Princess Louise Kensington for Children W 10 —H P (2nd or 3rd post)

Royal Free W C 1 —Reg (Rad Dept), Res Asst Path (H O)

Royal Masonic W 6 —Visiting Urological Surg

Royal Nat T N & E, W C 1 —R H S (2nd or 3rd post)

Royal Northern N 7 —2 H S s & C O s (2nd or 3rd posts)

St Alfege s S.E 10 —H P

St Alfege s S E 10 —H O Obst (2nd or 3rd post)

St Charles W 10 —Reg (part time) E.N T Sr Reg (part time) thor

St James s S W 12 —2 H.S.s (gyn & obst) Reg (phys med) Sr Reg (obst & gyn)

St Nicholas S.E 18 —H.P H S (2nd or 3rd post)

South London for Women & Children S W 4 —Gyn H.S (Female) 2nd or 3rd post.

University College W C 1 —Asst. Rad (Sr H M O) Dental Dept

Whittington, N 19 —Reg (clin path)

Westminster (All Saints Urol Centre S E 11) —R.S O (Jr Reg) Male

Provincial

Ashton Hyde & Glossop H M.C —H.S (orth)

Alton Hants Lord Mayor Treloar Orth — Sr Reg

Altrincham Gen —Asst. R.S O (2nd or 3rd post)

Aylesbury Royal Bucks —H.S (E.N T & ophth)

Aylesbury & Dist. H.M.C —H P (pæd)

Bath Royal United —H S (gyn & obst.), House Anæs

Bath St Martin s —H P

Barnsley Beckett —Cas O H S (Special)

Birmingham Queen Elizabeth —R.M.O (Jr Reg or Reg)

Birmingham United —Reg or Sr Reg (psych)

Birmingham Rubery Hill.—H P (3rd post)

Birmingham Hollymoor —H.P (3rd post)

Birmingham Sorrento & Lordswood Maty —Obst H S (2nd or 3rd post)

Birmingham Canwell Hall Babies —H P (2nd or 3rd post)

Birmingham Accid & Rehab Centre — H.S

Bradford Royal Infy —H S (thor surg)

Bradford Royal Infy —H S

Bradford St. Luke s —H O (anæs)

Brighton Royal Alexandra for Sick Children —H.P

Brighton & Lewes H.M.C —Sr Reg (orth surg) Jr Reg (orth surg)

Braintree Black Notley —Orth H O

Bromsgrove Barnsley Hall —Jr Reg

Bromley Group H.M.C —Sr Reg (pæd)

Bristol Charterhouse-on Mendip San.— Jr H.O

Bristol Ham Green Hosp & San.—Jr H O

Bury Gen —Cas O, H S

Bridgend Morgannwg Mental —Jr H.M.O

Bournemouth Royal Victoria —H.P

Bournemouth Royal Victoria.—H.S (ophth & E N T)

Bowdon Ches Manchester Throat & Chest.—Jr E N T Reg H O

Coventry & Warwick —H.P

Chichester Royal W Sussex —H S (1st or 2nd post)

Chertsey St Peter s —Res H.S for Gyn & Special Depts

Cardiff Whitchurch—H P s
Chesterfield & North Derbyshire Royal—H O (cas)
Carmarthen West Wales Gen—H S; R S O
Chelmsford Broomfield—Med Reg
Chelmsford St John s—Obst H S
Chelmsford & Essex & St John s—H S. (Spec Depts)
Canterbury Kent & Canterbury—H S (E N T & E)
Chester Royal Infy—Jr Reg (anas)
Chester Royal Infy—M O (Jr H M O), orth & cas
Chorley & Dist—H S
Dewsbury Gen—H O (derm)
Davyhulme Park—H O (Reg) Non-T B Thoracic Surg Centre
Derby Pastures—Jr H M O
Dundee Dist & Royal Mental—Jr H M O
Darlington Mem—E N T Reg
Doncaster Royal Infy—H S (E N T & ophth) H S
Exeter Royal Devon & Exeter—2nd H P
Eye Suffolk Hartismere—Jr H M O
Farnborough Kent—H P (pred) H S
Farnham Surrey—Asst Obst. O (H O)
Great Yarmouth & Gorleston Gen—H S
Griffithstown Mon County—Jr H M O (orth)
Grimsby Gen—Res Anæs (Jr H M O)
Guildford Royal Surrey City—H S (orth & traum)
Huddersfield Royal Infy—Rad Reg, E N T Reg (Jr Reg)
Hexham Gen—Jr Orth Reg Jr Reg (gen surg)
Hereford Gen—H S (2nd post), cas, E N T & frac
Haverfordwest Pembroke County War Mem—R S O, H S
Halifax Gen—H S
Halifax Gen—Jr Obst Reg
Halifax Royal Infy—1st H S (2nd or 3rd post), Jr Reg (cas & orth)
Halifax St John s—H P
Hounslow, Middx—H S (cas anæs &c), H P
Harrogate Royal Bath & Rawson Conval Wing—R M O (2nd or 3rd post)
Hertford County—H P (2nd or 3rd post), Male
Hull Royal Infy—H S (E N T), Orth H S
Hull Royal Infy—H S
Hull Victoria for Sick Children—H P
Ilford King George—H P, H S
Ipswich Borough Gen—H S (gen surg)
Ipswich E Suffolk & Ipswich—H S (gen surg) H S (orth & frac), H S (E N T, ophth), C O & Asst H P
Isleworth W Middlesex—Sr Reg (anæs)
Kettering Gen—H S (traum & orth)
Leamington Warneford Gen—H P
Leamington Spa Warneford Gen—R H S (E N T & ophth) 2nd or 3rd post
Leeds United & University—Sr Reg and Tutor Orth Surg
Leeds United Hosp s & University—Sr Reg & Tutor (Dept. Med)
Leeds Gen Infy—Reg or Sr Reg (anæs) Reg & Sr Reg (National Radioth Centre) Reg or Sr Reg (surg) Reg (Male), E N T
Leeds R H B—Reg (gen surg) Halifax
Leeds R H B—Asst Phys I D (Sr H.M O)
Leeds R H B—Cons Anæs.s (Huddersfield) (Bradford) (Hull)
Leeds Menston—Jr Reg s (psych)
Lincoln County—H O (orth & frac)
Lowestoft & N Suffolk—H S
Malvern St Wulstan s—Jr H M O (San & Thor Unit)
Manchester Crumpsall—Jr Reg (med)
Manchester 19 Duchess of York Babies—H P
Manchester, 13 St Mary's—H P (neo natal)
Manchester Royal Infy—2 Jr Surg. Reg s
Mansfield & Dist Gen—Sr H S (acc. & orth)
Mansfield Harlow Wood Orth—Jr Reg
Newcastle upon Tyne R H B—Reg (T B & chest dis) Middlesbro, Sr Reg (E N T), Cumberland, Sr Reg (urol) Newcastle
Newcastle upon Tyne R H B—Cons Asst Chest Phys (Hartlepool & Stockton)
Newcastle upon Tyne R H B—Asst Ophth (Sr H M O) Tees side
N W Met R H B—Sr Reg or Reg (Harperbury Mental)
N W Met R H B—Surg Reg (Shrodells) Sr Anæs Reg (Peace Mem & Shrodells)
N E Met R H B—Sr Reg (Research Fellow) psych Runwell Mental, Sr Surg Reg (Chase Farm), Reg (cas & admiss) Oldchurch
Nuneaton Manor—Gyn & Obst H S
Nuneaton Manor—H P (gen med)
Nuneaton Manor—H.S (gen surg & cas)
Nelson Reedyford Mem—Res Surg Reg
Nottingham Gen—Aural H.S Jr Aural Reg
Nottingham Gen—Sr Res C O (H O 2nd or 3rd post)
Newport, I W St Mary's—H S H P
Newport Mon Royal Gwent—H O (orth), H O (derm & V D) H O (E N T & ophth)
Oxford R H B Northampton & Kettering H M C s—Reg (pred)
Oxford Eye—Jr H S
Pontefract Gen Infy & Hydes—H P (1st post)
Pontypridd Church Village Gen—Reg (anæs) Reg (diag X ray), Jr Reg (surg) H O (med) 1st post H O (surg) 2nd or 3rd post.
Portsmouth St. James s Mental & Nervous Disease—Sr Psych Reg
Portsmouth St Mary s—Cas O (Jr Reg) H S
Portsmouth Group H M C—Reg (Diag Dept)
Portsmouth Royal—Surg Reg
Preston Royal Infy—H O (E N T), H O (urolog) H O (ophth)
Redruth Camborne Redruth Miners & Gen—2nd H S (obst & gyn)
Rhondda Porth & Dist—H O (surg) 1st post Jr H M O (surg)
Rotherham Doncaster Gate—Res H S
Rochdale Birch Hill—H P
Romford Oldchurch—Jr Reg (path)
Romford Oldchurch—R H O (neuro surg)
Ryde Royal I W County—H S
Rochford Gen—Res H P (H O) Chest Unit & Clinic
Rochford Gen—H S
Southampton Borough Gen—H.S.
Stamford & Rutland—Cas O & H P, H O (surg)
Salisbury Gen—H S
Scarborough—Jr Reg (surg)
Shotley Bridge—Reg (Regional Thor Surg Unit)
Scotland Northern R H B—Rad Reg (Sr Reg), Reg (anæs)
St Albans Napsbury Mental—Jr Reg
Sheffield No 1 H M.C—2 Jr Reg.s
Sheffield Nether Edge—H O (maty)
Sheffield City Gen—H S (orth), C O
Sheffield City Gen—2 Cas O.s H.S (orth)
Sheffield R H B—Cons Psych (Dep Med Supt) Bracebridge Heath
Southport Gen Infy—Res H P
South Western R H B—Anæs (Sr H M.O), Bristol Clin Area
Skipton Gen, Yorks—H S (2nd or 3rd post)
Taplow Canadian Red Cross Mem—H P (jnr rheum)
Truro Royal Cornwall Infy—H.S (gen surg & gyn)
Tilbury & Riverside Gen—H P (Orsett)
Tunbridge Wells Dist Pembury—Res Anæs (H O) Orth H S H P (pred)
Wakefield Gen—R H O (med & pred)
Wakefield Manygates Maty—Obst. H S (2nd or 3rd post)
Wakefield Clayton—Res Orth O (Jr Reg)
Wakefield Pinderfields Gen—Jr Reg (orth)
Wallingford Fair Mile—Jr Reg
West Bromwich & Dist Gen—Res Anæs & H S
Worcester Royal Infy—H S (obst. & gyn) H S (gen surg) H.S (E N T)
Worksop Notts Victoria—H S C O
Welsh R H B—Sr Reg (Pembroke), Sr Reg (Carmarthen)
Winchester Royal Hants City—H S (gyn) H P (maty), H S (orth)
Winchester Royal Hants City—Jr Reg (Path Dept)
York Military (Civilian Wing)—R.M O (2nd or 3rd post)
New Zealand Dunedin Otago Hosp Bd—Asst M O (T B) Res M.O (T B)
New Zealand Dunedin—Med Supt
Ethiopia Addis Ababa Princess Tsahai Mem—Med Supt Surg s Phys.s

PUBLIC HEALTH

Dublin Cork Mobile Mass Rad Unit—Med Director
Edinburgh City—Asst Sch M O
H M Colonial Service—M O (Mauritius)
Middlesex C C Health Dept—Dep Area M O s (Areas 9 & 10)
Ministry Labour—Factory Doctors Wells Lydd St Columb Lairford, Flint Paisley
Ministry Health—M O s (Male) Sudan
Royal Naval Medical Service—M O s
Rotherham County Borough—A M O H & A S M O

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Nutrition and Antibodies

IT now seems that the relation between nutrition and antibody production is less close than might be expected. True, GELL[1] found that well nourished British soldiers had better antibody responses than half-starved German civilians, but he remarked that the differences were slight BALCH[2] has now measured the diphtheria antitoxin production of two groups of patients whose nutritional state differed widely

One group comprised 25 severely ill patients, many with advanced malignant disease and most with low serum protein levels who had lost up to 40% of their normal body weight In other words they were comparable to emaciated victims of Belsen.

The other group contained 19 well nourished subjects of whom 5 were in good health, 6 had an inguinal hernia and 8 had either cerebral vascular accidents or cardiovascular disease without cardiac failure All had retained normal weight for at least six months, and their disability was not of a kind to influence their nutritional state

BALCH chose diphtheria antitoxin as the test antibody because the antigen—diphtheria toxoid—can be had in highly purified form, because in immune persons the antitoxin response is high and relatively uniform and can be accurately estimated even in low concentration, and because, with purified toxoid, the antitoxin is the only antibody produced and its concentration in the serum is thus a measure of the patient's total capacity to produce circulating antibody All patients of the two groups were first proved to be Schick-negative, and each then received intramuscularly 42 Lf (0 12 mg) of toxoid Thereafter blood antitoxin levels were ascertained at three day intervals for at least three weeks, and in some patients at longer intervals until death. A rise in circulating antitoxin was usually noted within four days of the toxoid injection, with a maximum response between the fourteenth and twenty-fourth day As in all experiments of this kind, the amount of antibody produced varied greatly between one patient and another, but there was no indication that in the depleted group the response was smaller than in the well-nourished group, indeed, the trend was in the opposite direction Antibody response did not seem to depend on age, on serum protein, serum-albumin, or serum globulin level, or, surprisingly, on antibody level before the test dose of antigen was given. A number of patients showing the poorest antibody response did not acquire infection, whereas others developed infections although their antibody production was normal.

BALCH concedes that his results do not show whether diets rich in protein may enhance antibody production Such diets have been advocated by CANNON and his colleagues[3] for preventing infection after surgical operations on nutritionally depleted subjects. BALCH doubts, however, whether antibody production is of prime importance in postoperative infections Wound sepsis, hypostatic pneumonia, peritonitis, and genito urinary infections are more probably caused by interference with the circulation than by failure to produce antibodies CANNON's conclusions are also open to question because in his investigations animals were mostly subjected to an extremely low protein intake—often 1–2% of the diet—and the consequences of such a regime may not indicate accurately what happens in the nutritionally depleted human Furthermore, there is evidence that the relation of nutrition to antibody production may be more subtle than that suggested by CANNON, who holds that protein depletion means failure of antibody production and that this failure can be corrected by protein repletion For example, STOERK et al [4] showed that pyridoxine-deficient rats produced less antibody to sheep erythrocytes than rats given a complete diet (normal controls) or a diet reduced in quantity to equal that eaten by the pyridoxine-deficient animals (inanition controls) A similar finding has been reported by AXELROD et al,[5] and by AGNEW and COOK[6] with sheep erythrocytes and typhoid H antigen Like BALCH, STOERK et al and AGNEW and COOK observed that the inanition controls tended to produce more antibody than the normal controls Pyridoxine deficiency interferes with amino acid metabolism and may thus hinder globulin synthesis, and STOERK et al suggest that this may impair antibody production, perhaps directly and by causing lymphoid atrophy, which is a feature of pyridoxine deficiency, the importance of the lymphocyte in antibody production is now well established.[7] For the present, therefore it would seem that reduction of the dietary protein is less likely to hinder antibody production than is interference with protein metabolism We still know nothing about the optimum intake of protein for antibody production or about the effects of a rapid, compared with a slow, turnover of globulin Meanwhile, we have to bear in mind that antibody production is not synonymous with resistance to all infections

Distinction Awards

NOT least important of the many ways in which the N H S differs from the conventional State medical service is its method of paying the consultant From the time of his appointment, after 14 years or more of medical training, his remuneration rises automatically to a maximum of £2750, which may be reached at the age of 40 Thenceforward any increase depends on his securing one of the three grades of distinction awards offered to a third of the whole body of consultants, chosen by a mainly professional committee This committee reaches its decisions after considering recommendations from different groups of colleagues who know the candidate in different capacities, but it also takes account of the desirability of spreading the awards suitably among the specialties, and likewise (since one of the aims of the service is to improve consultant services at the periphery) among the geographical regions Nobody would claim that this combination of cross bearings and rationalisation will always work equitably, and experiment in the next few years may show that professional opinion, collated in this way, ignores real merit almost as often as the fee paying public ignored it

1 Gell P G H *Proc. R Soc. Med* 1948 41 323
2 Balch H H *J Immunol* 1950 64 397
3 Cannon P R Wilder R W Woolridge, R L Benditt E P *Ann. Surg* 1944 120 514 Cannon, P R *J Amer med Ass* 1945 128, 360
4 Stoerk H C Eisen H N John H M *J exp Med* 1947 85, 365
5 Axelrod A E Carter B B McCoy R H Geisinger R *Proc. Soc exp Biol N Y* 1947 66 137
6 Agnew L R C Cook R *Brit. J Nutrit* 1949 2 321
7 See McMaster P D Hudack, S S *J exp Med* 1935 61 783 Ehrlich W E Harris T N *Ibid* 1942, 76 335 Oakley C L Warrack, G H., Batty I *J Path Bact.* 1949 61 179

in the past But the awards are, after all, additional to a competence and if, like marriage, they are something of a lottery, they should, also like marriage, tend on the whole to reward the worthy If a financial incentive is still useful in medicine, they provide it within the service, they introduce an element of flexibility into a system that might otherwise be dismally rigid, and we know enough of those already made to say that some have gone to first rate men whose modesty has forbidden expectations.

In the House of Lords last week Lord MORAN, as chairman of the Awards Committee, described how the awards are allocated, and pointed out that they are an integral part of the remuneration of consultants—not something that could be removed quite easily either as an economy or because of inconvenience caused, for example, to the universities The N H S in England, Lord MORAN said, has at present only 56% of the specialist establishment which the Ministry of Health thinks it will ultimately need "Medicine, like other professions and other industries, must appeal competitively for the man of promise," and he felt sure that "if it were not for these awards we should not compete successfully" With few exceptions, in his opinion, consultants are in favour of the awards scheme and would be shocked if it were withdrawn they signed their contracts on the understanding that after they reached the peak remuneration of £2750—perhaps at the age of 40—there would still be a chance of financial advancement, and deep discouragement and disquiet would be caused if the agreement were for any reason dishonoured before the scheme had even been tried

"If the financial circumstances of the country, as once before, meant that it was necessary to make a percentage reduction in the salaries of every profession, then medicine would gladly bear its share, but to take a fraction of a single profession and to confiscate a considerable proportion of their income is, I think, hardly in accordance with the elements of justice"

We share Lord MORAN'S view We think it right that exceptionally able consultants should be able to earn fairly large incomes, without looking for them in private practice We recognise that there are cogent objections to the new arrangement, and that it would have been far simpler to pay consultants as though they were Civil Servants but we believe that an innovation of this potential value deserves full trial, and we should deplore any attempt to interfere with it soon after it has made its difficult start With surtax at its present level, the experiment costs the nation little, and we retain our hope that in a few years, with such modifications as may be needed, the awards system will win general approval as a useful departure from precedent, applicable possibly in other branches of medicine and also in other professions

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THE HARVEIAN ORATION

THE fresh light shed on Harvey s life and work by successive Harveian Orators inspires increasing admiration It was only fitting that Sir Leonard Parsons, F R S, in his oration last week, should discuss the contribution made by Harvey and his contemporaries to pædiatrics, with particular reference to that comparatively little known work, *De Generatione* This, as the orator observed, contains a wonderful description of the development of the human embryo from the eighth week of intra uterine life onwards It also suggests that rickets was so prevalent in England in the 17th century that children walked and talked much later than they do now—a hypothesis further supported in the writings of Shakespeare, who makes the Nurse exclaim with wonder of the three year old Juliet—

"For then she could stand alone, nay, by the rood,
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Harvey is believed to have influenced Glisson in his decision to take up medicine, and so he can be given some indirect credit for Glisson's work *De Rachitide*, which appeared in 1650 Another close friend, it is thought, was Sir Thomas Browne, whose writings touched on rickets but whose principal contribution to pædiatrics lay in the antenatal field, certain of his statements can almost be taken to anticipate the effects on the embryo of dietary deficiencies and infection in the mother Finally, the orator turned to Sydenham and contrasted his restatement of the value of pure observation with Harvey's emphasis on experiment It was Sydenham who first described rheumatic fever in detail—though without mentioning the state of the throat in this condition—and it was the combination of his and Harvey's methods which raised British medicine to its greatest heights

CONFERENCE ON RADIATION HAZARDS

THE conference organised by the new Institute of Biology and the Atomic Scientists Association, with support from the British Association, at the Royal Institution on Oct 20-21 opened with symposia on the biological effects of radiation and the protective measures used against any kind of harmful nuclear radiation These prepared the way for the geneticists to discuss the hazards of radiation to the general population Several speakers insisted that those who control the output and distribution of radioactive materials or other sources of dangerous radiation should be animated by a high sense of duty In the geneticists' view, since experimental mutations caused by X rays are detrimental, if such mutations occurred in man and were maintained for many generations the prospects for the human race would be gloomy, some even said that man already has quite enough genes for natural selection to play on, and more would be an encumbrance or worse The last symposium, on atomic energy and the future, somewhat lightened the gloom by emphasising that there is no proof that deleterious mutants are produced in man by radiation, so we can take heart provided we also take precautions In the final session there were strong expressions of opinion on the still greater hazards facing the scientist in the cloud of secrecy which is spreading over his work and which threatens his heritage of integrity and his traditional desire to reveal the truth The atomic scientists were reminded that evil may arise from their studies Without them the atomic bomb would not exist, they have thus become a menace to civilisation and suspect by the great body of the public The plea behind these remarks was for action at the highest level to put an end to the prostitution of science

ALCOHOL AND THE MOTORIST

CONVICTIONS are not easily obtained under section 15 of the Road Traffic Act, 1930, which lays down penalties for 'Driving, or attempting to drive, or being in charge of a motor car on a road or other public place, while under the influence of drink or drugs to such an extent as to be incapable of having proper control" The driver's capability of having proper control has usually to be judged from the opinion of police and medical witnesses, and in borderline cases their evidence is often conflicting because the police describe the accused's condition when he was arrested, whereas the doctor does not examine him until he is charged, which may be some time later Dr Gorsky[1] strongly disapproves of acrobatic tests for drunkenness, such as walking along a chalk line or repeating difficult phrases, which confuse the nervous and are sometimes remarkably well done by the drunken Alcohol affects a man's car-driving long before the stage of dysarthria and incoördination, the driver who faultlessly performs all the mechanical movements of driving may yet be dangerously defective in judgment, reaction time, and consideration for others, on which avoidance of accidents largely depends

The alcohol content of the blood and urine, or of the breath, which is now being studied in America,[2] will reveal how much alcohol the driver has consumed, though delayed absorption may lower the findings in habitual drinkers, but the intoxication produced varies widely in different people and circumstances Nevertheless, in Sweden the blood alcohol level is always estimated when motorists are charged with drunkenness or involved in an accident, and a fine follows automatically if the level is over 0 08%, while if it exceeds 0 15% the punishment is up to a year in gaol In Denmark, too, even if the clinical examination is satisfactory, a blood-level of 0 1% will earn the motorist 14-40 days imprisonment

1 Gorsky A *Med leg J* 1950 18 48
2 Harger R N Forney R B Barnes H B *J Lab clin Med* 1950, 36, 306

In New York where the blood urine, or breath is analysed for alcohol within two hours of the motorist's arrest, and no medical examination is made, a blood level of 0 05% or less is prima facie evidence that the accused was not intoxicated, but findings between 0 05 and 0 15% are not prima facie evidence either way There is no such definite rule in this country, though very low or very high blood levels will usually be conclusive Otherwise the doctor who examines an arrested motorist must build up his conclusions from a multitude of clinical findings Only occasionally will the magistrate be convinced by such observations as that the accused could eat a fried egg next morning (see p 494) [3]

The antihistamine drugs have complicated the picture Some of them, though they do not cause intoxication by themselves can intensify the action of alcohol, so that a quantity which normally has little effect will produce drunkenness The taking of these drugs is sometimes offered as a defence, though it is just as illegal to drive a car when under the influence of a drug as when drunk

The Abstaining Motorists' Association in Sweden [4] has an impressively growing membership and the insurance companies now offer its members reduced rates having found that even a glass of beer on an empty stomach makes the average driver more prone to accidents Our roads would be safer if all motorists noted this fact

"GIVE US THE TOOLS"

ON his installation last week as president of the Society of Medical Officers of Health Dr J M Gibson, of Huddersfield said that the foundations of the public health service have been undermined, and the society must indicate very clearly what tools and materials are wanted for its rebuilding Unfortunately so much might be spent on the elaborate structure for treating disease that expenditure on prevention might be curtailed specialisation had increased to the point of having "57 varieties" of consultant but new houses were the primary need for health. The M O.H could not remain divorced from hospital work, and his voice should be heard on the regional board as well as on house committees and management committees (The most essential qualification for a hospital superintendent, in Dr Gibson s opinion, is a medical training and sooner or later lay administration will have to be abandoned on grounds of both efficiency and economy) The M O H. must have as much responsibility as possible in the running of isolation hospitals retaining his clinical contact—preferably as medical superintendent He ought to control the admission and discharge of patients from tuberculosis sanatoria and bookings for admission to maternity homes should likewise be made through his department He should coördinate the care of old people and the children's officer should operate as one of his team Dr Gibson also felt that the supervision of milk at all stages of production and distribution should be restored to the M O.H he wanted preventive medicine more closely linked with industrial medical services and he urged that the supervision of children should be continued through adolescence, if not throughout adult life

He added that believing in the justice of their claims, members of the public health service await with confidence the decision of the arbitration tribunal now considering the need for salaries sufficient to attract recruits to public health.

THE DANGEROUS PLACENTA

THE diagnosis and treatment of placenta praevia was the subject of a crowded and lively meeting at the Royal Society of Medicine on Oct 20 Mr John Stallworthy reported the results obtained by an Oxford team in which the radiologist, Dr Frank Reid, played a prominent part, the main features of his technique were the use of an aluminium filter to reveal soft parts and the application of gravity in positioning the patients It was not suggested that radiography should or could replace clinical methods, but in expert hands it was an invaluable aid to diagnosis In cases where the presenting part failed to engage, placenta praevia could often be confirmed or excluded without vaginal examination, and in antepartum hæmorrhage X rays might demonstrate the site of the placenta and enable the patient to be discharged If the presenting part could enter the brim and act as a haemostat vaginal delivery was permissible if not caesarean section was indicated In a series of 250 cases there had been 1 maternal death (nasopharyngeal carcinoma), the uncorrected foetal wastage had been 18%, and the incidence of caesarean section 40%

Mr C H G Macafee thought radiography of limited value here, clinical methods, excluding vaginal examination should suffice for diagnosis Placenta praevia was most commonly posterior, but the importance of the forward displacement of the presenting part had been exaggerated Placenta praevia had been demonstrated in 108 of 341 cases of antepartum hæmorrhage admitted to the Royal Maternity Hospital, Belfast, in the years 1944–48 50 had been delivered vaginally after artificial rupture of the membranes, and 58 had undergone caesarean section There had been 1 maternal death (incompatible blood transfusion) and an uncorrected foetal wastage of 14% Prof F J Browne congratulated the opening speakers on the excellence of their results, which he attributed partly to chemotherapy, to the increasing use of blood transfusion and caesarean section, and to the early transfer of cases by general practitioners

Mr McIntosh Marshall remarked that both the opening speakers had vindicated his persistent emphasis on the importance of physical signs Placenta praevia could very often be diagnosed from the history and abdominal palpation Other speakers dwelt on the supreme importance of conservative methods of treatment, and spoke with feeling of the uncontrollable hæmorrhage which might follow an injudicious vaginal examination One and all agreed that radiography however good, must not be allowed to displace clinical methods, and when Mr Stallworthy rose to explain that he shared this opinion complete harmony descended on the meeting

THE DENTAL NURSE IN NEW ZEALAND

THE school dental nurses who for nearly thirty years have relieved New Zealand dentists of the routine dental treatment of school children have achieved a high standard of technical efficiency and meet a very real need The British dental mission which visited New Zealand to study this system has submitted a report [1] which shows how wholeheartedly the scheme is supported by the dental profession, the education authorities and the public Dental nurses receive a two year training with pay before going out to work in the standard type clinics which have been erected in school playgrounds Each nurse assumes responsibility for not more than 500 children between the ages of $2^1/_2$ and 16, her duties including the filling and extraction of deciduous and permanent teeth and instruction in oral hygiene The enrolment of children below 7 years requires no more than the written consent of the parent, but after that age a child must first be made dentally fit by a private practitioner at the parent's expense, and the readmission of defaulters is subject to the same rigorous condition The British mission makes no attempt to judge the suitability of the scheme for this country, but justly observes that if it were introduced, some modifications might be necessary and the fullest coöperation of the dental profession would be required

THE INFECTIOUS TUBERCULOUS

THE fabric of our social services, for all the work that has gone into its weaving is still marred by ragged gaps For half a century or more we have known that tuberculosis is no less preventable than leprosy yet it has still to be prevented True, there is growing insistence on prompt and proper treatment of the disease but this derives from knowledge of the beneficence of modern therapy rather than from any sturdy new determination to be done with the infection The sources of food poisoning we assiduously track down and remove the sources of tuberculosis we commonly leave in the general community because we have simply not decided that this shall not happen

The London County Council has been trying for some time to arrange suitable accommodation for patients with open tuberculosis who are unlikely to benefit from sanatorium treatment and who have either an unsuitable home or no home at all the common lodging houses of London are known to harbour at least 160 such people For over two years the responsibility for these people has been in doubt, but the Ministry of Health has now ruled that this rests, not with the regional hospital boards, but with local health authorities, and according to a report by the council s health committee, the Minister ' contemplates the provision of

3 *Daily Mirror* Aug 30 1950 p 4
4 *Pedestrians' Association Quarterly News Letter*, October, 1950 p 10

1 New Zealand School Dental Nurses Report of United Kingdom Dental Mission H M Stationery Office Pp 43 1s 3d

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2 Harger R N Forney R B Barnes H B *J Lab. clin Med* 1950, 36, 306

THE SUPPLY OF SPECIALISTS

From the opening speech Lord MORAN got the impression that what was wrong was that there were not enough doctors to go round Speaking of the supply of specialists, of which he had expert knowledge as chairman of the Awards Committee, he said that shortage was certainly the fundamental factor The Colonial Medical Service needed 1500 specialists and was about 200 short The R.A.M C needed 455 and it had only 197—a further 157 known as graded specialists were really of junior registrar status To second to the R.A.M.C specialists from the N.H S was no good if there was a shortage in the N.H S The Ministry of Health aimed at ultimately having 7000 whole time specialists in the N H S But in England and Wales there were only 5200 part time specialists and if part time was estimated at three quarters time this meant that only 56% of the Ministry s target were available He believed that the fundamental task was to see that there were enough specialists for every service Men would not undertake an intensive course of training spread over 14 years unless they were offered adequate material rewards At present this was being done by the novel method of distinction awards, and Lord Moran did not believe that any Government would scrap this system without giving it a trial One of the purposes of the N.H.S was to upgrade backward hospitals, and this could only be done by some decentralisation of specialists The distinction awards would help to make this possible by making men a little independent of private practice

NEEDS AND REMEDIES

Lord BOYD ORR supported integration of all medical services as an important and essential part of our preparations for defence The new biological weapons as well as atomic bombs, would not discriminate between civilians and soldiers Lord AMULREE was anxious that we should spread the high standard of British medicine among people in the Colonies by exchange visits of doctors He also wanted to see many more patients brought from the Colonies to Great Britain for specialised and difficult forms of treatment

Lord WEBB-JOHNSON reminded the Lords that he had raised the need for improved pay and conditions of service in the Forces nearly two years ago After describing the disappointing answers he had received at intervals since he reaffirmed his belief that there was no basis for integration until the rates of pay were settled He believed that secondment not only from the N.H.S to the Forces and the Colonial Medical Service but in both directions would be of great value Within the last few weeks the Colonial Office had arranged for superannuation rights to be carried on if a doctor entered the Colonial Medical Service It should be possible for a doctor within twelve months of leaving the N.H S to be seconded from the N.H.S to one of the other Services and in due course to return to his N.H S appomtment

The Marquess of SALISBURY said, that as chairman of a wartime committee of Ministers set up to allocate the supply of doctors between the Armed Services and the civilian population he had formed the opinion that there should be some permanent scheme to operate in peace as well as in war to ensure, without violent fluctuations, a fair flow of doctors where they are most needed

GOVERNMENT REPLY

Lord SHEPHERD replying for the Government admitted that the Forces were short of 400 specialists and 100 general duty doctors In the Colonial Service the shortage was 200—or 10% These figures were serious but he thought they need not cause undue alarm provided the Government of the day and the medical profession were anxious about the situation With better organisation and better conditions, he was sure, we could change the deficit, not into a surplus, but into a sufficiency Was the deficit due to bad conditions in the Services or to shortage of doctors outside ? In 1930, Lord Shepherd said the number of registered doctors was 54 537 of whom 9000 lived abroad in 1940 the figures were 62,847 and 11,000 this year 77,730 and 12,000 But though there was an increase in the number of doctors was there really an increase upon which we could depend for feeding the Forces ? We must remember that many women were now doctors and half of them did not practise Again only the younger members of the profession were likely to be attracted into the Services The older ones were already settled and unlikely to leave their families and practices save in an emergency The large N H.S demands had also reduced the number of doctors available for the Services These figures he suggested, showed that we must not think how to transfer men and women from outside into the Forces or into the Colonial Empire but how to recruit more doctors

According to an inquiry being made, at the request of the Minister of Health, there seemed to be a preponderance of students who wanted to be trained as specialists and not as general practitioners This suggested that the encouragement offered to students to prefer specialist work was sufficient Indeed the Minister of Health wished to use his influence and that of the hospital and university authorities to persuade some of these would be specialists to reconsider their position and to take early service in the Army as general medical men The Government had also arranged that men might transfer from the N.H.S into the other services at home or abroad without losing their pension rights or seniority status Hospital authorities had lately been asked to encourage some members of their medical staffs to obtain experience in the Colonies or the Forces by a temporary transfer

An interdepartmental committee, consisting of representatives of the Ministry of Defence and the Ministry of Health was considering the coördination of the medical services with the Forces and the Health Services The Government were also considering the future of the Medical Priority Committee, the Central Medical War Committee, and the Committee of Reference At any rate the integration of the Services had the blessing of the Government

Turning to the question of payment, he said that it was now realised that after years of difficulty there must be a restrained movement both of wages and of salaries The claim of the medical branches of the Services could be made not merely on grounds of the increased cost of living, but because it was right that men in the Forces should not be worse off than medical men in civil life or than men employed on general military occupations in the Forces The Government were conscious that promises had been made before on this point Though he could not yet make an announcement he understood that the Ministries concerned had pressed this point upon the Treasury, and he was informed that "the hope is not too large to entertain that this will be the last time that your Lordships are bothered about this particular claim The circumstances were urgent and he was sure it would be in the interest of the country that this thorny problem should be settled satisfactorily once and for all

In England Now

AT school in the physics laboratory we were encouraged to believe that heat, light and sound are important Those responsible for the new debating chamber of the Commons clearly share this view In future our members of Parliament will legislate in a good light with cool heads and warm feet Breathing the correct amount of suitably warmed air, they will hear without effort the lightest word of the most distant back bencher

The main electric lighting of the new chamber is provided by 150 glass panels in the ceiling which can be brought up gradually from nothing to full strength as daylight fades Two air-conditioning plants circulate warmed air at a temperature which will vary with the number of occupants On a division air is diverted from the chamber to reinforce the normal supply in the crowded lobbies Beneath the green carpet, steel panel foot warmers have been embedded flush in the floor to offer a gentle warmth to the members feet The temperature of the chamber will usually be kept at about 67°F , or in summer, about 10°F below outside temperature These adjustments will be made by an engineer from a control room below the chamber To help him in his task of intelligent anticipation a 65 ft periscope and a loud speaker enable him to follow what is going on in the chamber

Microphones hang at intervals from the galleries One has even ventured on to the table before the Speaker Small loud speakers—unobtrusive grilles in the woodwork between every two seats—reinforce natural speech but are set so low that they will not clash with natural speech, and those nearest to the microphone which is in use are automatically switched off Members will sit on the traditional green leather benches, which are now cushioned with sponge rubber The width of the seat and the slope of the back was settled after taking medical opinion

Whatever the architects and the æsthetes may say about the tactful Gothic style of the new chamber, the members should certainly find it more comfortable than the old one

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hostels and night sanatoria by local health authorities as an essential part of the future development of the tuberculosis services" At present, however, he cannot approve the council's scheme for building a night sanatorium and industrial workshops on the site of St Peter's Hospital, Stepney[1], and in the face of this refusal the committee, which cannot obtain vacant hospital accommodation, proposes to seek his approval for the first of a series of hostels which would be opened in adapted premises and financed by money voted for other purposes There are two special reasons for such action as this One is that some of the homeless tuberculous, though possibly trained in sanatorium precautions, may be less likely than most to observe the prescribed routine The second is that many in this group will be unfit for full employment—they may in fact be homeless for this reason—and these can claim in their own right, some thought from the community If the rule of first things first is to prevail the committee will find the modest support it seeks

SEBUM AND KERATIN

STUDIES of the surface skin fat, or sebum, and of keratin are throwing new light on the ætiology and treatment of skin disorders MacKenna and his colleagues[2] obtained sebum from the skin of normal men by immersing the forearm in acetone which was subsequently removed by distillation In the residue they found about 5% of squalene (an unsaturated hydrocarbon, $C_{30}H_{50}$) and significant amounts of vitamin E, but no significant amounts of any other fat-soluble vitamin, of β carotene, or of ergosterol They can find no decisive evidence that the squalene has any special metabolic rôle, but vitamin E, which is an anti oxidant, may help to retard the oxidation of unoxidised fatty acids and related compounds in the sebum Anti oxidants may also be very important for keeping the skin flora within bounds, and the so called seborrhœic disorders may prove to be due to qualitative abnormality of sebaceous secretion, or dyssebosis, rather than to excess secretion, or seborrhœa, which is observed chiefly in acne vulgaris

Much uncertainty also exists regarding the chemical processes of keratin formation Reducing agents, such as sulphur, have long been used for treating not only "seborrhœic dermatoses" but also conditions of faulty keratinisation. the use of pyrogallol in psoriasis is an example Reduction is probably an essential feature of keratin formation On the ground that sodium *p* aminosalicylate inhibits the metabolism of the tubercle bacillus by increasing its oxygen demands, Thiers[3] has administered this substance in conditions associated with dyskeratosis, such as psoriasis, *pityriasis rubra pilaris*, and *lupus erythematosus* Usually the erythematous element was unaffected, but the rate of pathological keratosis was apparently lowered The favourable effect of sodium *p* aminosalicylate seemed to be cancelled by ascorbic acid but enhanced by nicotinamide, when these were administered concurrently To patients with lupus erythematosus Thiers gave 10 g of sodium *p* aminosalicylate by mouth and 0 5 g of nicotinamide intravenously each day In two cases, one of which was of thirty years duration, both the erythema and the desquamation disappeared completely, and in a third these signs decreased Thiers admits that the number of cases is small, but the idea behind the method may stimulate further studies of the biochemistry of the skin and its products

PREPARING FOR GENERAL PRACTICE

THREE deans of American medical schools who visited this country early in the year were struck by the unpopularity of general practice as a career In their report,[4] they make the following pertinent comment 'Undoubtedly one develop ment in British medical education which causes great concern has been exaggerated by the National Health Service Act That is that almost all students and recently graduated physicians want to become specialists Even before the Act the lot of the general practitioner in Britain was not too happy, and today it is demoralizing We do not refer to overwork but rather to the fact that he seems destined to a routine life which does not offer the necessary facilities to practice good medicine and which fails utterly to offer the professional incentives which lead to continued growth of the physician If we really believe that the general practitioner is the 'backbone of medicine' then let us prepare him for the most difficult task in medicine After our experience in England, we are confident that this is the most important job facing the medical schools of the United States during the next decade '

There are signs that the Americans are already studying the problem in their own country and taking steps to deal with it Last year American students in 31 "classes" were asked about their plans[5] Of those questioned, 47 3% declared their intention of entering general practice, 31 1% wanted to specialise, and the remainder retained an open mind The proportion wanting to specialise was higher among the senior than among the junior students, but the over all proportion of would be general practitioners was 14% higher than it had been three years before This rather unexpected trend is associated with a growing recognition of the need to prepare students for general practice Last year 42 of 79 American medical schools had courses designed to interest their students in this field of medicine, and had arranged to attach their students for varying periods to local practitioners, 15 teaching hospitals had established internships specifically designed for prospective G P s, and 12 were creating registrarships for the same purpose

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THE Wellcome Foundation have given the Royal Society of Medicine £80,000 to establish within the society a medical research library to be known as the Wellcome library

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Parliament

Medical Man-power

OPENING the debate in the House of Lords on St Luke's Day, Lord HADEN GUEST said that though he urged the greater integration of the National Health Service, the medical services of the Armed Forces and the Colonial Medical Service, he did not think that these services should be fused into one, for their traditions and functions were separate But under present world conditions we must provide good medical services not only for the population of these islands and the Colonies but also for the Army, Navy, and Air Force The N.H S had about 19,000 general practitioners, about 5500 consultants, and about 3500 senior hospital medical officers and senior registrars—a total of 28,000 The Armed Forces had about 2500 and the Colonial Medical Service about 1900 To secure an inflow of doctors into the Colonial Medical Service the Medical Priority Committee (of which Lord Haden Guest is chairman) had recommended that doctors who accepted Colonial Office posts in such places as Hong Kong and West Africa should be regarded as discharging their liability to military service

In this country the Services could to some extent make up their deficit by employing civilian doctors But this system had its drawbacks The civilian doctor received higher rates of pay than the other officers in his unit perhaps even higher than the director of medical services of his Army formation. As a result no young man would apply for a short service commission when he could go out, qualify as a specialist, and come back at a higher rate of pay The usual objections made to Service life, besides unfavourable pay, were that it cut a man off from his profession limited his medical experience, and took him abroad Then when he was between 50 and 60 it left him stranded with a smallish pension and nowhere to go Much the same objections applied to the Colonial Medical Service The remedy Lord Haden Guest declared, was to put the other Services on equality with the N.H S He believed that

> Every doctor unless he deliberately opts out should from the time of his qualification and registration be put on an equal footing with every other doctor and should be eligible for the same pension and other rights on the terms and conditions which are applicable to the National Health Service

He also suggested that a formal link should be created by the Ministry of Health between representatives of the medical branches of the Services in each command and the N H S and university representatives in the area If all were put on an equal footing the prospect of two years service with the Forces or six years in the Colonies, would change from a duty to be performed to an opportunity to be accepted

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1 See *Lancet* July 8 1950 p 62
2 MacKenna R M B Wheatley V R Wormall, A *J invest Derm* 1950 15, 33
3 Thiers H *J Méd Lyon* 1950, 31 699
4 Diehl H S Chandler I R Dorst S F *J Amer med Ass* 1950 143 1492
5 Anderson D G Tipner A

ACADEMIC AND EDUCATIONAL

Institute of Orthopædics Course in diagnostic and prognostic methods in orthopædics Nov 6–11 Fee 7 gns Apply Dean 234 Great Portland-street W 1

Society of Apothecaries of London 10 Lectures on Modern Methods of Diagnosis and Treatment. 3 30 and 5 p.m Dec 4–8 Full details to be announced later Registrar

Chelsea School of Pharmacy Chelsea Polytechnic S W 3 Lectures on Technical Aspects of the Blood Transfusion Service by A Sterling Ph C Mondays 7 30 p.m commencing Oct. 30 Fee 4 lectures 10/- Apply to Head of School

Empire Rheumatism Council Post graduate weekend course at Apothecaries Hall Nov 17–19 Fee 2 gns with application to Gen Secretary Tavistock House (N) Tavistock-square W C 1

The Royal Society Government Grant for Scientific Investigation Third allotment 1950 Apply to Asst Secretary (latest date Nov 30)

Leeds University Lecturer in Pædiatrics and Child Health (£1000–£100–£1500) Apply to Registrar (closing date Nov 21)

Glasgow University Lecturer in Psychological Medicine (maximum £1500) Apply to Secretary (closing date Nov 15)

Glasgow University Jr Asst. Department of Midwifery Apply to Secretary (closing date Nov 11)

London Hospital Medical College Hutchinson triennial prize value £60 Subject. Factors Influencing Growth in Length of Bone Particulars from Dean.

St. Mary's Hospital Medical School Full time Asst Director Pædiatric Unit (£1250–£1750) Apply to Secretary (closing date Nov 18)

Hospital for Sick Children W C 1 Research Fellowship for Pathologists to investigate Malignant Disease in Childhood Tenable 1 year (£1000) Apply to Morbid Anatomist.

LIST OF HOSPITAL VACANCIES

(Further particulars of appointments available on request to Advertisement Manager)

Bethlem Royal & Maudsley S.E 5—Jr Reg H O (2nd or 3rd post) Reg Sr Reg

Bearstead Mem N 16—Res Obst. M.O (H O) Res. Obst M.O (H O) Hampton Court (3rd posts)

Brompton S W 3—3 H.P.s (non res)

Central Middlesex N W 10—Res Reg Anæs

Children's S.E 26—Res. M.O (H O) 2nd or 3rd post

Elizabeth Garrett Anderson N W 1—1st H.P (med & pæd) Female

Hammersmith Postgrad Med. Sch of London W 12—Reg (orth)

Hampstead Gen N W 3—H.P H S Cas O

Hosp for Sick Child, W C 1—Orth. Reg (part time) O.P Dept

Hosp for Sick Children W C 1—2 H.P.s (Jr Reg.s) H.S (Jr Reg)

Hosp for Women W 1—Res Jr Reg

Hosp of St. John & St Eliz.—Surg Reg (Male)

London Jewish E 1—H S (H O)

London E.1—Sr Reg (obst & gyn)

London Chest E 2—Cons Radiol. (Dept of Radiol.)

London Chest E 2—Res M.O (Jr Reg Reg or Sr Reg)

Marie Curie N W.3—H.S. (Female)

Memorial. S.E 18—H.P C O (2nd or 3rd post)

Middlesex Hosp W 1—Cons Asst. Ophth. Surg

Middlesex Hosp W 1—Sr Surg Reg Sr Reg (phys med)

Mile End E 1—H.P (H O)

National Heart W 1—Res. M O (Jr Reg or Reg) Male, H.P (3rd post) Male, Maid's Moreton Bucks

National Temperance, N W 1—H.P (gen)

National for Nervous Diseases W C 1—Asst Clin. Path (Sr Reg)

National for Nervous Diseases W.C 1—Asst Reg (O.P Dept.) Sr Reg

N Middlesex, N 18—Jr Reg (anæs)

N.E Met. R.H B—Cons P t. Pæd

N W Met. R H.B—Reg (T.B) Chest Clinic.

N W Met R H.B—P t Ophth Surg (Royal Northern)

Paddington W 9—3 H.P.s (gen), 2 H.S.s (gen) H.S (obst. & gyn)

Prince of Wales Gen N 15—H.S (orth., frac & traum) and Sr Cas. O (2nd or 3rd post) Gyn H.S (3rd post) Sr H.S (3rd post) Jr Reg (Res Anæs) Jr Reg (Res Cas O) Jr Reg (Res Sr H.S)

Royal Northern N 7—H.S (2nd or 3rd post)

St Alfege's S E.10—H P

Royal Northern N 7—2 H S.s & C O.s (2nd or 3rd posts)

South London for Women & Children S W 4—Res M O (Jr Reg) Female

St Thomas's S E 1—P t Sr Reg (X ray Diag Dept)

St Peter's & St Paul's, W C 2—P t Cons Rad

St Charles W 10—2 H P.s (gen) H.P (T.B) 2 H.S.s (gen)

St George in the East E 1—Jr Reg (C O)

St Nicholas S E 18—H.P H S (2nd or 3rd post)

Wanstead E 11—H.S

Westminster (All Saints Urol Centre S E 11)—R.S O (Jr Reg) Male

Provincial

Ashton Hyde & Glossop H.M.C—H.S (orth)

Aylesbury Royal Bucks—H.S (E.N T & ophth) 1st or 2nd post

Aylesbury Tindal Gen—Res Surg O (Jr Reg) Male

Aylesbury Royal Buckinghamshire & Aylesbury Isolation—H.P (pæd) 2nd or 3rd post

Barnsley St Helen—Jr H.M O

Barrow in Furness. N Lonsdale—Res. H.S

Basingstoke Rooksdown Hse Plastic/Jaw Unit—P t. Cons Dental S

Bishop's Stortford Havmeads—Jr Reg (surg) H O (cas)

Bebington Wirral. Clatterbridge Gen.—H.S (orth.)

Birmingham United Queen Eliz.—Non res Med Reg (Reg or Sr Reg)

Birmingham. Royal Orthopædic.—Res. H O (2nd or 3rd post) Locum Jr H.M.O

Birmingham Sorrento & Lordswood Maty—Obst. H.S (2nd or 3rd post)

Birmingham Canwell Hall Babies—H P (2nd or 3rd post)

Birmingham Accid & Rehab Centre—H.S

Bradford Royal Infy—Reg (orth)

Bradford Royal Infy—H.S (thor surg)

Brighton Royal Alexandra for Sick Children—H P

Braintree Black Notley—Med Reg (Pul T.B Unit)

Braintree. Black Notley—Orth H O

Bolton. Townleys—Res Jr Med Reg Res H.P (2nd or 3rd post) pæd

Boston Gen—Res H.S

Bromsgrove Barnsley Hall—Jr Reg

Bromley Group H.M.C—Sr Reg (pæd)

Bury Gen.—Cas O H.S

Bridgend Morgannwg Mental.—Jr H.M.O

Bournemouth Royal Victoria—H.P

Blackpool Victoria—H.S (Surg Unit)

Burnley Victoria—Jr Orth Reg

Burton/Trent Gen Infy—H.S

Cambridge Addenbrooke's—Res M.O (Sr Reg)

Cambridge Fulbourn (Mental)—Jr H M O (Tempr)

Colchester Essex County—2 H.S.s

Colchester Mvland—Res H P

Chichester Royal W Sussex.—H S (1st or 2nd post)

Chertsey St Peter's—Res H.S for Gyn & Special Depts

Cardiff Whitchurch—H P.s

Carmarthen West Wales Gen—H S R.S O

Chelmsford St John's.—Obst. H.S

Chelmsford & Essex—Sr Reg (radiodiag)

Chelmsford & Essex & St John's—H.S (Spec Depts)

Canterbury Kent & Canterbury—H S (E N T & E) 2nd or 3rd post

Chester Royal Infy—Jr Reg (anæs)

Chorley & Dist.—H.S

Dewsbury Gen—H O (derm)

Davyhulme Park—H.O (Regional Non T B Thor Surg Centre)

Darlington Mem—Res Anæs (Jr Reg) C O (H O)

Darlington Mem.—E N T Reg

Doncaster Royal Infy—Jr Reg (E.N T)

Dudley Guest.—H.S C O Res Anæs

E Anglian R H.B—Reg (path) Ipswich Area

Epsom St. Ebbas—Tempy Sr Reg or Reg

Eye Suffolk Hartismere—Jr H.M.O

Farnham, Surrey—Asst Obst O (H O)

Glasgow Shieldhall Fever—Res M.O (H O or Jr H.M.O)

Glasgow Western R.H B—Cons E N T Surg (Falkirk Stirling & Clackmannan) Cons Psych. (Glasgow & Killern) Phys Supt. (Cons) Belvidere I D P t. Asst Ophth (Glasgow Eye Infy) Sr H.M.O

Glasgow Western R H B—2 Sr Regs (gen surg) Hairmyres & Stirling Sr Reg (E N T surg) Stobhill

Great Yarmouth & Gorleston Gen—H S

Griffithstown Mon County—Jr H.M O (orth)

Grimsby Gen—Res Anæs (Jr H M.O)

Guildford Royal Surrey Cty—H S (orth & traum)

Hillingdon Middx.—Non res Reg (cas)

High Wycombe & Dist War Mem—Res H O (surg) 2nd post

Huddersfield Royal Infy—Rad Reg E.N T Reg (Jr Reg)

Hereford Gen—H.S (2nd post) cas E.N T & frac

Haverfordwest Pembroke County War Mem—R.S.O H.S

It was tantalising of the Ministry to send me their fascinating *List of Proprietary Medicines Advertised Direct to the Public* only to tell me of therapeutic miracle workers that my N H S patients cannot enjoy For this is a list in which Chaucer and Milton, Donne and Herrick, Bunyan and Swift, Keats and Gerard Manley Hopkins—to say nothing of James Joyce—might have collaborated How Mr Ivor Brown would enjoy its rich assonances, its apt alliterations, its artful neologisms How its anonymous author, after des patching his appendiceal after thoughts deleting 50 entries, must have thrilled at what remains Even a compositor would wax lyrical over it

Who would not babble of Bablets, and Blue Lion Fox Nuts (Shadforth's)—I like the bracketed Shadforth's, no ordinary undenominated blue lion fox nuts for *my* patient Then there's Blinblow's Asthma Cure, the name a cure in itself You can imagine the poor panting asthmatic at the chemist's counter, bubbling and blowing until—*at last*—he gets the whole name out in one triumphant gasp Cured on the spot, I'll swear! De Witts Little Laxative Pills have a tactfully minimising sound, no need to be ashamed of asking the lady assistant for *little* ones Grasshopper Ointment conjures up a vision of some serious soul rubbing it in while he studies the little grey books to rid himself of "the grasshopper mind" Nothing could be more Sunday school sounding than Infants' Friend, surely a tincture for the lambs of the flock, while for the hardened black sheep there are always Jordan's Gin Pills There's Odds On Liniment for horsy devil may care characters, and the hard bitten worldling, disillusioned and taciturn, may find stern comfort in Shadforters or Songo For Christopher Robin there's Teddylax, and for diehard imperialists Union Jack Paste—by Gad, Sir! White lions (not to be confused with Blue) bring up the rear of the Noah s Ark procession, and for a last beneficence there's Omega Oil

The list will be a godsend in prescribing for my private patients

* * *

A Scandinavian authority on Blood alcohol tests for motorists has sent me an extract from the *Daily Mirror* of Aug 30 "Enclosed," he says, "you will find the latest news about the investigation of intoxicated drivers in England, and I hope you will be pleased with the progress made" The extract is as follows

THE FRIED EGG TEST GAVE HIM LICENCE BACK

A man accused of driving a car while under the influence of alcohol ate a fried egg at the police station in the morning after he was arrested magistrates were told yesterday

And that said Mr J H Glover was proof his client was sober

Doncaster magistrates restored the driving licence of the man who ate the egg—George Stevenson 51 a Leeds traveller, who was convicted on February 14

Mr Glover said 'It is often the subject of a music hall joke but for anyone who can eat a fried egg on the morning after they have experienced a surfeit of alcohol it is the acid test'

News

The report for 1949–50 by the management committee of the Executive Councils Association for England includes figures for the rate of payment to general practitioners participating in the N H S during the twelve months from April 1 1949 to March 31, 1950 Payments totalled £37 999 462, and 1721 practitioners were receiving the fixed annual payment of £300 Among the 123 executive councils the capitation fee varied from 15s 6d–16s (2 councils) to 17s–17s 6d (16 councils) On Jan 1 1950, a total of 16 598 principals and 947 assistants were in the service in England

The University of Leeds has conferred the title of emeritus professor upon Dr M J Stewart on his retirement from the chair of pathology Dr R E Coupland has been appointed lecturer in anatomy Dr G Watkinson lecturer on medicine and Dr J A L Vaughan Jones part time lecturer in public health

On Oct 18 the Bisset Hawkins medal of the Royal College of Physicians of London was presented to Sir Wilson Jameson for his services to public health

On Thursday Nov 16 at 5 P M Dr E R Cullinan will deliver the Bradshaw lecture at the college He is to speak on the Clinical Interpretation of Jaundice

On Tuesday Oct 31 at 8 P M at the Royal Anthropological Institute 21 Bedford Square London W C 1 Prof W E Le Gros Clark F R C S F R S and Mr L S B Leakey PH D will speak on the Miocene Apes of Kenya

On Monday Nov 6 at 5 P M Prof. R A Peters F R S will deliver the Cameron lecture of the University of Edinburgh He has chosen as his subject Applications of *Chemical Defence* Research in Medicine

In England and Wales notifications of poliomyelitis during the week ended Oct 14 were paralytic 223 (241) non paralytic 85 (112), total 308 (353) The figures for the previous week are in parentheses Total uncorrected notifications for 1950 up to and including the week under review are 7012 The corresponding figures for 1947 1948 and 1949 were 7454 1825, and 4478

Sir Harry Platt is to deliver the Bradshaw lecture to the Royal College of Surgeons of England on Thursday Nov 9, at 5 P M He has chosen as his subject Diagnosis and Prognosis in Sarcoma of Bone

On Wednesday, Nov 1 at 5 P M, Dr George Edwards will deliver the first Hewitt lecture to the Faculty of Anæsthetists of the Royal College of Surgeons He is to speak on Frederick William Hewitt

Prof H E Frisbie (California) will deliver a lecture on the Histopathology of Enamel Caries at Guy s Hospital Medical School, London S E 1 on Tuesday Nov 7 at 5 30 P M

Prof R J Kellar will deliver a lecture at University College Hospital Medical School London W C 1, on Friday Nov 3 at 5 P M He is to speak on the Circulation in Pregnancy

Mr Herbert Read D LITT will deliver the Ernest Jones lecture to the British Psycho-analytical Society, at 1 Wimpole Street London W 1, on Wednesday Nov 15, at 8 P.M He will speak on Psycho analysis and the Problem of Æsthetic Values

At a meeting of the Harveian Society to be held at 26 Portland Place London, W 1, on Wednesday Nov 15 at 8 15 P.M Lord Amulree will speak on Towards a Healthy Old Age

The Medical Defence Union s fine new offices at Tavistock House South Tavistock Square London W C 1 were opened at a reception on Oct 20 when Mr Ivor Back the president and members of the council received the guests The rooms which include a council chamber with fine oak furniture provide excellent accommodation for the M D U.s many and increasing activities

In England and Wales the stillbirth and infant mortality rates during the third quarter of this year were the lowest on record for any quarter According to provisional figures published by the Registrar General in his weekly return for the week ended Oct 14, the rates were stillbirths 22 3 per 1000 total births and infant mortality 24 per 1000 related live births

At the London Hospital dinner on Oct 19 Sir James Walton presiding, said that when he was a student the case-mortality of acute appendicitis was over 90% In his three months clerking every student looked after one or two cases of typhoid at times the hospital daily turned away 50 infants with summer diarrhœa, and a large proportion of operations were for excision of tuberculous joints or tuberculous glands of the neck Today as one who had spent most of his life in removing organs he was most impressed by the progress of preventive medicine Among the hospital staff the biggest change was the marvellous development of the team spirit, which was absent in his early days He concluded with advice on the doctor's management of his years of retirement and Sir Henry Tidy proposing The Chairman, paid tribute to his undiminished zest for living

A year ago Mr Wilson Hey the Manchester surgeon was fined for contravening the Dangerous Drugs Acts by supplying morphine to trained mountain rescue parties in accordance with the policy of the Mountain Rescue Committee (See *Lancet* 1949 ii, 1228) Subsequently the Home Office authorised the issue of morphine by local practitioners to the supervisors of mountain first-aid posts It seems that sometimes there has been difficulty in obtaining supplies in this way and now the Home Office has agreed that Mr Wilson Hey or his deputy may issue this drug Thus the practice followed up to a year ago has been officially accepted

The state of civilisation of a community can be deduced from the way it looks after its lame ducks—and ducklings—said Prof Alan Moncrieff when he addressed the 62nd annual general meeting of the Invalid Children's Aid Association on Oct 17 Judged by these standards Great Britain emerged with credit he continued especially since the Education Act of 1944 However many of the admirable facilities which might be provided for invalid children under existing legislation did not in fact materialise and there was scope for coöperation between voluntary bodies and local authorities in filling the gaps Dr O D S Agassiz of Queen Mary s Hospital Carshalton observed that the problem of the invalid child presented three aspects—accommodation education and training for an occupation He pointed out that these children could be helped to live remarkably normal lives and told a story of a spastic child taking dictation from another who could not write When they reached the words sufferer from cerebral palsy' the child ejaculated But I m not suffering

Dr Peter Henderson of the Ministry of Health said that there were 8000 physically handicapped children among the total school population of 5 million There were 74 special schools to cater for them of which 55 were run by local education authorities The eradication of rickets and osteomyelitis and the fall in the incidence of bone and joint tuberculosis had reduced the demand for special schools for the partially handicapped there remained long waiting lists for schools for severely handicapped children Prof W S Craig, of Liverpool, wound up the meeting with an appeal for £15 000 for the association s latest project—a holiday home for invalid children It had previously been disclosed by the treasurer that the association has an overdraft of about £12 000 and the excess of expenditure over income last year was £3000

CORRIGENDA *Effects of Cortisone in the Rheumatic Diseases*—In the first of the plans for administering Cortisone or A C T H enumerated in our report last week (p 483) of Dr Hench s lecture each course lasts for about 3–6 weeks With administration of these substances the serum protein and the hæmoglobin tend to become normal The substances that have been investigated as possible alternatives to cortisone include 21-acetoxy pregnenolone, delta 5 pregnenolone and desoxycorticosterone with or without ascorbic acid

Anti histamine Drugs and the Blood—Hydrochloride in the eighth line of last week's annotation refers to tripelennamine hydrochloride

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THE LANCET

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HAVING been allowed to run its damaging course for nearly six months, the illness of the London printing industry has now passed its second crisis and seems to be ending In expressing once more our deep regret at being prevented from meeting so many obligations in the past few weeks, we must also thank readers, contributors, and advertisers for the understanding they have shown We look forward to rapid recovery of full function

The Kidney and Cardiac Œdema

CARDIAC œdema cannot be satisfactorily explained by filtration of fluid from capillaries subjected to a slight rise in internal pressure ALTSHULE[1] pointed out that the extent of cardiac œdema was in no way related to the height of venous pressure, while RAY and BURCH[2] found that the œdema which followed ligation of the inferior vena cava tended to clear up despite a sustained rise in venous pressure in the feet Such factual observations have led to a search for some other factor, and attention has been diverted to the kidney

BORST[3] in 1938 remarked that in the circulatory collapse which follows hæmatemesis the kidney retains salt with such avidity that infused saline may raise the plasma-chloride as high as 20% above normal severe hæmatemesis is known to reduce the kidney blood flow[4] MERPILL[5] showed that in cardiac failure, too, the kidney blood flow is reduced, often very grossly, and this reduction is associated with excessive retention of sodium by the kidney MOKOTOFF and his associates[6] thought that the decreased glomerular filtration accompanying this diminished blood flow might account completely for the decreased salt elimination FEJFAR and BROD[7] support MOKOTOFF's hypothesis, citing the idea put forward by WESSON and his colleagues[8] that, while 85% of salt absorption takes place in the proximal tubules, reabsorption of the remainder is subject to quantitative regulation in the distal tubules In the distal tubules sodium chloride is absorbed at a fixed maximal rate reabsorption increases with slow passage of a small amount of glomerular filtrate and decreases when the fluid being filtered is larger in quantity and therefore moves faster LOWE[9] suggests that the salt retention associated with cardiac œdema should be subdivided into two groups First there are the cases in which salt excretion continues on a low dietary salt intake, so that by dietetic means alone œdema may be slowly eliminated In the second group mercurial diuretics are necessary to reduce salt and water reabsorption by the kidney and thus to get rid of œdema In cases belonging to this second group LOWE found an excessive amount of antidiuretic hormone in the urine BERCU et al.[10] have also noted antidiuretic effects following the injection into hydrated dogs of urine from patients with cardiac failure, but they thought that these effects were not due to a substance with the characteristics of 'Pitressin' It would certainly appear that diminished renal blood flow and glomerular filtration in heart failure do not, by themselves, account for the decreased salt elimination, hormonal factors are almost certainly involved BORST's observations of excessive salt retention[3] can be explained only by some profound alteration in the reabsorptive activity of the tubule cells

The mechanisms of reduced kidney blood flow and other changes in kidney function in heart failure are still mysterious BROD and FEJFAR[11] have made a valiant effort to solve the problem by observing nocturnal changes in cardiac output and kidney function, both in normals and in patients with heart failure It is known that at some stages of cardiac failure diuresis may take place during the night, but BROD and FEJFAR were unfortunate in that very few of their patients reacted in this way When diuresis did occur it was usually accompanied by an increase in kidney blood flow which simply indicated reversal of the daytime diversion of blood from the kidney to other tissues Fluctuations in kidney blood flow could not, however, be correlated in any way with changes in cardiac output right auricular pressure, or other hæmodynamic measurements made at the same time There was no relation between salt retention and venous pressure, such as might have been expected from BORST's[12] suggestion that salt retention contributes to the venous pressure rise in cardiac failure Reduction in renal blood flow and in elimination of salt is not confined to cardiac failure, it may be found in normal subjects during exercise[13 14] It has been suggested that in cardiacs reduced kidney blood flow may be determined by venous congestion,[15] but KATZ and his colleagues[16] have now shown that this effect is shortlived, in dogs, after a few days of sustained chronic renal congestion kidney function has returned to normal in respect of water and salt absorption Since there does seem to be a rough relation between reduction of renal blood-flow and the degree of clinical cardiac failure[11] it might be thought that anoxia contributed to these renal reactions AAS and BLEGEN,[14] however, have shown that both in normal subjects and in patients with cardiac failure kidney blood flow is *increased* by inhalation of 9 5% oxygen, but this of course, may not reproduce exactly the anoxic mechanisms in heart-failure It is difficult to avoid the teleological suggestion that the kidney blood flow is reduced by splanchnic vasoconstriction when a generally inadequate cardiac output is partitioned in the interests of other more vital organs

The importance of the kidney in cardiac failure is established Its blood flow may be grossly impaired, and almost certainly further factors—humoral or hormonal—exaggerate the activity of tubule cells in the retention of salt The place of pituitary and suprarenal cortical hormones in this picture is still ill defined Mercurial diuretics act primarily by depressing salt and water retention by the kidney PUGH and WYNDHAM[17] have demonstrated secondary beneficial consequences of

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Halifax Royal Infy —Jr Reg (surg)
Halifax Gen Jr Reg (surg)
Halifax Gen —H S
Halifax Gen —Jr Obst Reg
Halifax Royal Infy —Jr Reg (cas & orth)
Halifax St John s —H P
Hertford County —Jr Reg (surg)
Hertford County —H P (2nd or 3rd post), Male
Hexham Gen —2nd H S (gen surg)
Hull De la Pole —H O (2nd or 3rd post)
Hull Royal Infy —H S
Hull Victoria for Sick Children —H P
Isleworth W Middlesex —H O (orth)
Isleworth W Middlesex.—Reg (med)
Isleworth W Middlesex —Sr Reg (anæs)
Keighley & Dist Victoria —H S
Kettering Gen —H S (traum & orth)
Leamington Spa Warneford Gen — R H S (E.N T & ophth), 2nd or 3rd post
Leeds R H B —Reg s (chest diseases) Hull & Bradford, Sr Reg (psych) Menston
Leeds R H B —6 Psych.s (Sr H.M.O s) Menston Leeds, Bootham Park York, Storthes Hall, Kirkburton Stanley Royd Wakefield
Leeds R H B —Cons Bact (Hull Royal Infy)
Leeds United Hosp s & University — Sr Reg & Tutor (Dept. Med)
Leeds Gen Infy —H O s (ophth & gyn)
Leeds Gen Infy —Reg & Sr Reg (National Radioth Centre)
Leicester Markfield San & Isolation — Res Reg
Liverpool Royal Children's (City Branch) —Med Reg (Professorial Unit)
Liphook Hants King George s San for Sailors —H O (med)
Lincoln County —H O (orth. & frac)
Lowestoft & N Suffolk —H S
Malvern St Wulstan s —Jr H M O (San & Thor Unit)
Macclesfield West Park Branch —Res Obst. H O
Manchester Crumpsall —2 Jr Regs (med), Res Jr Reg (dental)
Manchester Ancoats —Jr Reg (med)
Manchester R H B —Cons Path (Ashton, Hyde, & Glossop)
Manchester Royal Eye —H S
Manchester Royal Infy —Jr Res Anæs (H O) 2nd post
Manchester Royal Infy —2 Jr Surg Reg s
Mansfield & Dist Gen —Sr H S (acc & orth)
Mansfield Harlow Wood Orth —Jr Reg
Middlesbrough Poole San —Res Jr Reg
Newcastle upon Tyne Princess Mary Maty —Obst Jr Reg
N E Met R H B —Cons P t Pæd (S I Essex Group) Cons P t Pæd (Old church)
Nelson Reedyford Mem —Res Surg Reg
Norwich Norfolk & Norwich —H S Sr Cas O (Jr Reg)
Norwich United Hosp s —Obst. H S (West Norwich Hosp)
Norwich Jenny Lind Hosp for Children —H S
Nottingham Gen —Aural H S Jr Aural Reg
Nottingham Gen —Sr Res C O (H O), 2nd or 3rd post.
Newport Mon Royal Gwent.—H O (orth) H O (derm & V D) H O (E N T & ophth)
Oxford Warneford & Park —Sr Reg
Oxford R H B —Cons Acid & Orth Surg , High Wycombe & Amersham
Oxford R H B —Cons Phys Med (Swin don, Cirencester & Pewsey)
Poole Gen —H.S (1st post)
Portsmouth St Mary's —Cas O (Jr Reg) H S
Preston Royal Infy —H O (E N T), H O (urolog) H O (ophth)
Plymouth S Devon & E Cornwall —H.S (1st post) Greenbank H S (2nd or 3rd post) Freedom Fields H S s (Devon port) H O (anæs) 2nd or 3rd post Freedom Fields H S (obst & gyn), 2nd or 3rd post H P (1st post) Freedom Fields H S (cas & frac), Greenbank, Jr Surg Reg
Ramsgate Gen —H S (1st post)
Redruth Camborne Redruth Miners & Gen —2nd H S (obst & gyn)
Romford Oldchurch —Jr Reg (path)
Rochford Gen —Res M.O (H O)
Salisbury Gen Hosp —Gyn H S H P (pæd) Odstock
Salisbury Gen Infy —H S (E N T)
Salford Hope —H O (anæs) H O (med), H O (surg)
St Albans City —Res H P (Med Team), 2nd or 3rd post Cas O (Male)
Southampton Borough Gen —Reg (gyn & obst)
Southampton Borough Gen —H S.
Stamford & Rutland —Cas O & H P H O (surg)
Scarborough —Jr Reg (surg)
Scotland Western R H B —Sr Reg.s (T B , orths radiodiag radiothy anæs derm E N T surg ophth , pæd. psych path)
Scotland South Eastern R H B —P t. Cons Asst Phys (Leith) P t Cons Asst Phys (Deaconess Hosp)
Scotland South Eastern R.H.B —T B Phys (Sr H M.O) E Lothian Berwick Selkirk & Roxburgh Anæs (Sr H.M.O) Edinburgh Royal Infy
Scotland South Eastern R H B —Reg s Obst. & Gyn (West Fife), Radiotherapy, (Edinburgh Royal Infy) T B (Edinburgh Royal Victoria) 2 Anæs (Edinburgh Royal Infy) Psych (Fife Mental) Psych (Dingleton Mental) Surg (Ban gour) Surg O P Dept (Edinburgh Royal Infy)
Scotland Northern R H B —Rad Reg (Sr Reg) Reg (anæs)
Sheffield Children s Hosp Unit —H.S
Sheffield Royal Infy Unit —Sr Reg (ophth) Sr Surg Reg or Reg
Sheffield No 1 H M C.—2 Jr Reg s (path)
Sheffield City Gen —H S (orth), C O
Sheffield City Gen —Jr Surg Reg
Sheffield Royal Infy —H S (orth)
Sheffield R H B —Cons Psych (Dep Med Supt) Bracebridge Heath
Sherborne Yeatman —H S (Female)
South Mimms Barnet. Clare Hall —Jr Reg (surg) Thor Unit
Southport Gen Infy —Res H P
Skipton Gen Yorks —H S (2nd or 3rd post)
S Western R H B —M O (Sr H M O) Bath Clin Area Mendip Hosp
S W Met R H B —Jr H M O (Blood Trans Service)
S Western R H B —Venerol (Sr H M O)
S Bristol N Glos Bath & S Som
S Western R H B —2 Cons Orth Surg.s (Bristol Clin Area)
S Western R H B —Dep Med Supt (Sr H M O) Ham Green Bristol
S Western R H B —Cons Rad (W Cornwall Clin Area)
S Western R H B —Cons Path (W Cornwall Clin Area)
S Western R H B —Cons Path (S Som Clin Area)
S Western R H B —Dep Res Phys. (Sr H.M O) Winsley Chest Hosp
Swindon Group —Res Cas O (H O) Res H S (Gen Surg Unit), H O, Res H S (gyn & obst.)
Stourbridge Corbett —H P C O
Shrewsbury Royal Salop Infy —Orth H S & C O
Shrewsbury Royal Salop Infy —H.P
Swansea Hospital —Res H S (1st or 2nd post)
Stockport. Stepping Hill —H O (surg) H O (med)
Stockton-on Tees Winterton —2 H O.s
Taunton & Somerset.—Res H P (pæd) Jr H.M O (gyn & obst.)
Truro Royal Cornwall Infy —Cas H.S
Truro Royal Cornwall Infy —H S
Wakefield Clayton —Res H.S
Wakefield Clayton —Locum Res Surg O
Wakefield Clayton —Res Orth O (Jr Reg)
Welsh R H B —Jr H M O (chest dis & T B) Rhymney & Sirhowy
Welsh R.H B —Sr Surg Reg (Pontypridd & Rhondda)
West Bromwich & Dist. Gen —Res Anæs & H S
Wickford Runwell —H P (3rd post)
Winchester Royal Hants City —Jr Reg (Path Dept.)
York The Retreat —Cons Phys. Supt
York Maternity —2 Res Obst. H S.s (2nd or 3rd post)
York Military (Civilian Wing) —R M O (2nd or 3rd post)
New Zealand Dunedin Otago Hosp Bd — Asst M O (T B), Res M O (T B)
New Zealand Dunedin —Med Supt
New Zealand Auckland Hosp Bd — 2 Radiols (Jr or Sr Specialists)

PUBLIC HEALTH

Birmingham City Educ Cttee —Asst. Sch M.O
Derbyshire C C —Asst Sch & Asst. Maty & C W M.O
Essex C C —Asst City M O H (South Essex Health Area)
Leeds City —Asst M O (maty & c.w)
Ministry/Labour Prison Service —M O.s (Male)
Ministry/Labour —Factory Doctors Easingwold Dumbarton, Carnforth Haddington
Northumberland C C —Asst County M.O (maty & c w)
Rotherham County Borough —A M.O.H & A S M O
W Sussex C C Littlehampton U D C Worthing R D C —Dist M.O H & Asst C M O (Male)
Yorkshire W Riding C C —Asst. C M O.s (Harrogate & Settle P H Divisions)

GENERAL PRACTICE

(Executive Councils Form E C 16A)

Woodford Essex —Urban List 1500

HOSPITAL NON MEDICAL VACANCY

West Bromwich Hallam —Biochem Asst

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into clinical medicine—not yet as a form of treatment (for he is careful to deny it this status) but as a means of modifying disease processes many of which were previously regarded as unrelated The medical world can be grateful for the care with which the Mayo Clinic work was begun and has been continued, but not even Dr Hench's wise caution can obscure what seems to be the dawn of another new day in therapeutics To this sunrise in the Middle West, investigators elsewhere have of course contributed and all who study steroid hormones will be glad to see Reichstein's name joined with those of Hench and Kendall Professor of pharmaceutical chemistry at Basle, he has devoted most of his life to steroid substances and cortisone was among the 28 hormone substances he is said to have isolated from the suprarenal gland in four years intensive research His investigations on the steroids of plants have enabled him to indicate possible means of converting them into cortisone

PAIN IN MYOCARDIAL INFARCTION

WITH infarction of the heart, diagnosis has far outstripped prognosis An attempt to put prognosis on a surer footing has therefore been made by Behrmann and his colleagues[1] who have studied the relation between pain and mortality in 150 cases among which the mortality rate during the first four weeks was 35% They found that the mortality increased with the duration of pain among patients whose pain lasted less than 5 hours the rate was 11%, but it rose to 34% when the pain lasted 5–25 hours and to 39% with pain for 25–120 hours As to the site of pain, among the 44 patients in whom it was confined to the anterior trunk the mortality rate was 59% whereas among the 95 with pain radiating beyond the anterior trunk the rate was only 18% This rather surprising observation—that patients with pain confined to the anterior trunk are more likely to succumb—has been recorded previously[2], and Behrmann and his associates suggest that in patients with a large infarct which proves fatal, profound shock may cause dulling of the sensorium and a diminution in the 'overflow phenomena of impulses which are apparently a part of the picture of referred pain.

This study demonstrates once again the variability in the mode of onset—a feature further underlined by Stein[3] in an account of 7 cases of myocardial infarction where chest pain was present only on exertion The pain pattern was characteristic of angina pectoris and it was only through serial electrocardiograms that the correct diagnosis was reached In most of these cases however, there were clinical features suggesting infarction Thus, often the pain was severe it began, quite suddenly to come on with much less exertion than originally and the response to nitroglycerin became less satisfactory One of Stein's cases indicates that in a young adult anything like severe angina pectoris should arouse suspicion of infarction

LIGHTENING THE N H S DRUG BILL

DOCTORS in general practice who have tried to obey the Ministry's behests by prescribing *National Formulary* alternatives for proprietary or branded preparations are finding that some are unobtainable and likely to remain so for years because only the owner of the proprietary rights may make them In other cases the wholesale chemists are producing the *N.F* preparation under licence from the patentees, or they are buying the finished proprietary product from the makers and preparing it in accordance with *N.F* requirements Thus prescribing drugs in their non proprietary forms does not always save the Treasury much money however beneficial it may be to the prescriber's soul

Another way in which money might be saved with no loss of efficiency, is by reducing the waste of unused medicines Thousands of bedroom and bathroom cupboards—many of them in doctors' houses—are bulging with half empty bottles and boxes labelled The Mixture or 'The Tablets with the usual personal instructions about dosage As a rule nobody can be certain what these medicines are or for what they were originally intended, so they can seldom be used again In the end at an extraspecial spring-cleaning a move, or some more dismal occasion, they will be cast into the dustbin, or the bottles (unwashed) will be offered to the local pharmacist The uninformative labelling is based on the traditional view that it is no business of the patient what he is taking—scoffers even call this the cornerstone of therapeutics—though nowadays when the doctor usually hands the patient his prescriptions, only bad handwriting and natural inertia prevent his reading them Continental pharmacists must copy the prescription in full on to the label of every medicament they dispense If this practice was adopted here it would add considerably to the already heavy demand on pharmacists, but it would make it possible for household stocks of tablets, lozenges and even standard mixtures to be used if the need for which they were ordered arose once more And it would reduce loss of time and temper when a new patient produces the remains of "what the other doctor ordered'

That the nation's medicine bill is excessive was again emphasised last week by Sir John Charles,[1] chief medical officer of the Ministry of Health, when he addressed the annual meeting of the Executive Councils Association of England In the twelve months up to the last day of June, 211 million prescriptions were made out, and during the first six months of the year the average cost was 3*s* 1½*d* It is difficult he declared, to believe that medicine drinking on this scale is of even temporary benefit to the nation's health "Do we really need to breed a new race of three bottle men and women?' Steps are being taken, he said to help doctors to discourage the taking of medicines as a habit

SUPPLIES OF CORTISONE AND THE NEW ANTIBIOTICS

IN a written answer to a parliamentary question, the Minister of Health has announced that limited quantities of Cortisone are being imported for use in hospitals in this country, and that arrangements for production here will be considered as soon as possible The amount produced must depend, however, on the supply of the essential raw material (ox bile) for which no substitute is likely to be found in the immediate future Aureomycin Mr Bevan said, is already being imported, and the import of Terramycin will be considered if the need arises

Mr Herbert Morrison who as Lord President of the Council is the Minister responsible for the Medical Research Council, stated that an extensive programme of coördinated research on cortisone and related substances is being carried out by the council The provision of cortisone for the routine treatment of patients is, of course, outside the council's province, but he was informed that more research was necessary before the drug could be safely recommended for general use in rheumatoid arthritis

SYNERGISM AND ANTAGONISM OF ANTIBACTERIAL SUBSTANCES

A FEW years ago Ungar[2] and Bigger[3] showed that two antibacterial substances might act synergistically on bacteria in culture media or serum Ungar showed that the inhibitory effect of penicillin on staphylococci and streptococci was at least doubled by the presence of sulphapyridine in a concentration which per se was insufficient to exert any influence on the organisms Bigger found that the presence of sulphathiazole in culture media and serum greatly increased the dilution at which penicillin inhibited staphylococci Clinically there was some evidence that in pneumococcal pneumonia penicillin and sulphadiazine together were more effective than sulphadiazine alone[4] Bigger[5] later investigated the activity of six antibacterial substances—sulphathiazole penicillin, streptomycin, chloramphenicol boric acid and *p* amino salicylic acid—in pairs on *Bact coli* in a synthetic medium Thirty combinations of two of these substances are possible and in all but five of these the two components acted synergistically, there was marked antagonism between boric acid and sulphathiazole and between boric acid and penicillin Antagonism also exists between penicillin and succinyl sulphathiazole[6] and between penicillin and chloramphenicol[7] Spicer[8] has investigated the action of five antibiotics—Aureomycin chloramphenicol streptomycin, penicillin, and Bacitracin —in pairs on a number of organisms When the bacterial strain was sensitive to each of the pair the

1 Behrmann J H Hipp H R Heyer H E *Amer J Med* 1950 9 156
2 Rosenbaum F F Levine S *Arch intern Med* 1941 68 913
3 Stein I *Amer Heart J* 1950 40 32

1 See *Manchester Guardian* Oct 27 p 10
2 Ungar J *Nature Lond* 1943 152 245
3 Bigger J W *Lancet* 1944 ii 142
4 Dowling H F Hussey H H Hirsh H L Wilhelm F *Ann intern Med* 1946 25 950
5 Bigger, J W *Lancet* July 8 1950 p 46
6 Poth E J Wise R I Slattery M P *Surgery*, 1946 20 147
7 Jawetz E Speck R S *Proc Soc. exp Biol N Y* 1950 74 93
8 Spicer S *J Lab clin Med* 1950 36 1[illegible]

mercurial diuresis on the heart output and venous pressure in heart failure, and mercurial diuretics, combined with low salt intake, thus assume a new importance in the management of the cardiac invalid One of the many unanswered questions is why mercurial diuretics are phenomenally successful in some cases but fail miserably in others

The N H S Through American Eyes

THE advertising campaign launched by the American Medical Association on Oct 8 marks the climax of a "national education program" intended to mobilise public opinion against the compulsory health insurance proposals now before Congress This appeal to the American people through the press and over the radio was expected to cost the A M A about $1,100,000, obtained by a levy of $25 on every member of the association, but its total cost was very much greater, and the value of the advertising space provided by banks, insurance companies, drug stores, and other interested concerns has been estimated at $19 million [1] The object of the campaign is twofold It is designed to make the public "health insurance conscious" by extolling the virtues of voluntary schemes, and simultaneously to "alert the American people to the danger of socialised medicine and to the threatening trend towards state socialism in the U S A" [2]

Naturally enough, a great deal is being said in America about the condition of British medicine, whose less satisfactory features are held to be the result of carrying compulsory health insurance to its logical conclusion A delegation of the A M A which visited the United Kingdom last year [3] attribute "the decay of medical practice in England" partly to National Health Insurance but more particularly, it seems, to the National Health Service Act After reviewing the events which led up to the inauguration of the service, and surveying its "cumbersome" administrative machinery, the delegation proceed to examine its three main sections—hospital, public health, and general medical

The British specialist is said to be working short hours for good money but to be paying for this privilege with his freedom and to be "as surely chained to his post as though he were bound by visible shackles" None the less this same specialist is in the habit of leaving an out patient session as soon as his time is up, regardless of the number of patients waiting to see him Our hospitals are handicapped by chronic overcrowding, their efficiency is decreased (*sic*) by an occupancy rate of 90–95%, and they are being inundated with minor cases which make them unable to care for patients who are seriously ill Further, their running costs are stated to be excessively high, and the visitors found an independent hospital which operated at about two thirds the cost of a similar nationalised one In general, the quality of hospital work is suffering and there is an increasing tendency to substitute laboratory investigations for clinical observation Turning to the local health services, the delegation remark on the breakdown of school dentistry, and on the multiplicity of agencies concerned with maternity and child welfare The ambulance and car services, while admirable in spirit, are being abused by all concerned, and thousands of patients, with attendants, are being "hauled around all parts of England" The tuberculosis services have suffered from the division of responsibility which followed from the Act, and "5000 sanatorium beds and hospital beds have become unavailable because of lack of funds and personnel" Finally, as might be expected, the delegation were particularly impressed by the plight of the general practitioner They found him trying to cope with more patients than he could treat satisfactorily, and consequently referring more and more cases to the hospitals from which he himself was virtually excluded The report continues

> "The general practitioner in Great Britain as we observed him is no longer a free, independent professional person. He finds himself sharply circumscribed in function, in influence and in outlook His work tends to become more superficial as he is increasingly concerned with clerical and technical trivialities The correction of present defects will depend on a reappraisal of the function of the family doctor and his reestablishment as the backbone of medical service to the population at large"

Commenting on the health service as a whole, the delegation take the view that it is designed to establish "not a better system of medical care, but a better controlled one" In so doing it has widened the gap between specialist and general practitioner, has aggravated the already great geographical inequality of distribution of doctors, and has added greatly to the cost of medical care The middle income group, who were accustomed to paying their way, have benefited, but the low income group received as good or better medical care before the Act All in all, the concept of medical care without direct payment by the consumer is held to be fundamentally unsound

The opinions of these experienced American observers are not to be lightly dismissed, and some of them are of course widely shared by doctors in this country At the same time, we must remember that we are being measured against the standards of the richest country in the world It is true, as the Americans are not slow to point out, that the cost of our nationalised service has far exceeded the estimates, yet even today the annual cost is only about £9 per capita, whereas the average annual expenditure on medical care in the U S A is reported to be about $70 per person [4]—equivalent to £25 at the present rate of exchange (These figures are stated to represent 4% and 4 9% respectively of the national incomes in the two countries) All agree that the general practitioner's work suffers from the inflated lists which are still common, but we know of no evidence that overcrowding caused by the N H S is leading to a fall in the standards of medical care in the hospitals, or that consultants are tending to leave "on the dot" because they are paid for sessions of so many hours Many of the bad points of our medical services—and we know that they are numerous—have been developing for a generation and cannot fairly be put down to the National Health Service Act, which, if it has not halted the trend, has certainly not accelerated it The American delegation observe

> "The system that prevails in England today is certainly not all bad, but most of its virtues are those of the medical social service that existed before the Act"

We should prefer to say that the system is certainly not all good, but that many of its faults are those of the medical social services that existed before the Act

1 *New York Times* Sept 17 1950
2 *J Amer Med Ass* 1950 143 744
3 *Ibid* p 1420

4 Goldmann F *New Engl J Med* 1950 243 36

Annotations

THE NOBEL PRIZEMEN

THE 1950 Nobel prize for medicine goes to Dr Philip S Hench, Prof Edward C Kendall, and Prof Tadeus Reichstein, "for their discoveries concerning the suprarenal cortex hormones, their structures and biological effects" Professor Kendall, who is a true pioneer of biochemistry, produced some thirty years ago from several tons of thyroid gland, a few milligrammes of crystalline thyroxine, thus bringing the thyroid principle from the nebulous and indeterminate land of animal extracts into the realm of pure organic chemistry Long years research on suprarenal hormones led to the isolation in 1935, among other chemically pure substances, of Compound E or "Cortisone" To Kendall's friend Dr Hench, of the Mayo Clinic, goes the credit for introducing cortisone

Medical Societies

ROYAL SOCIETY OF MEDICINE

Medical Education

AT a meeting of the section of medicine on Oct 24, with Dr CHARLES E LAKIN, the president, in the chair, Mr ROBERT BIRLEY, headmaster of Eton College expressed strong dissatisfaction with the 1st M.B examination It had, he said, a great influence on secondary education, on the selection of doctors, and on the medical profession itself It set a great problem to school authorities, and whenever two or three headmasters were gathered together it was on the cards that they were discussing medical education References to the 1st M B in the B M A report on the medical curriculum, with whose views he was wholly in agreement, were almost too optimistic, for at the moment matters were getting worse rather than better Mr Birley was strongly of the opinion that boys and girls should have a more general and less specialised education, but the inevitable influence of 1st M B was in the opposite direction It was a source of amazement to him that in 1948 only about 13% of external candidates for the London University 1st M B passed the examination[1] there must be something very wrong either with the examination or with the candidates It might appear to be impossible to say for certain which was at fault, but it was significant that of 41 boys and girls carefully selected for admission by University College, London, from some 300 candidates, only 23 subsequently passed their 1st M B and so qualified for admission This cast grave doubt on the merits of the examination which nevertheless was a major factor in deciding who were to be the country's doctors in the future

Mr Birley then turned his attention to the syllabus, which he thought was getting out of hand The examination put a premium on the mastery and memory of facts Historically, it was a university examination, but there was an increasing tendency for it to be taken at school At Cambridge, for instance some colleges now insisted that all four parts be taken before going up, others merely indicated that this was preferable The university medical faculty had been mainly responsible for this by abandoning all premedical instruction Further figures from University College, London, showed that of 41 students for the 2nd M B, 18 had taken two years 19 three years and 4 four years from school certificate to obtain 1st M B[1] The general effect of the examination had been that school certificate was taken earlier and earlier—it was not the only factor involved in this general tendency—and that the teaching of subjects other than those needed for the examination was restricted The great question was whether a boy should take 1st M B late (i e, in whole or the greater part at the university) and have a wider general education or whether he should take it early at the expense of other subjects Economic pressure worked in favour of the latter solution but Mr Birley was strongly in favour of the former, and he cited the arrangements at the Berlin Charlottenburg Technical University where all students spent their first year on general studies with the consequent necessity of an extra year at the university as an example of how boldly this problem was being tackled abroad

THE CURRICULUM

SIR BENRY COHEN pointed out that the 1886 Medical Act had laid down that the standard of proficiency demanded in the qualifying examination should be sufficient to guarantee the possession of the knowledge and skill requisite for the efficient practice of medicine surgery and midwifery ' At that time with the limited medical knowledge that existed, the curriculum fulfilled this purpose Now the enormous expansion of medical knowledge made it necessary to restate the aims of the curriculum its purpose must be to show the student the scope and potentialities of medicine, to equip him with sound basic principles and indispensable techniques, and to give him resourcefulness and initiative The general structure of the curriculum should, however, be retained He agreed that the 1st M.B examination was at present unsatisfactory, and he suggested in the interests of general culture that when two of its subjects had been taken at school the remaining subject should be studied during the first university year at the same time the student should be allowed to attend without fee any other courses he chose in the university This was the practice in Liverpool. The preclinical course should teach the normal structure and function, including normal psychology, of human beings, and should also impress on the student that he was a member of a family and of society Continuity of the preclinical and clinical years was vital, and the elimination of the concept of disease entities in favour of ' departures from normal structure and function and their causes " would promote such continuity Basic principles were more important than factual information though of little value without practical illustrations As an example of general principles, Sir Henry remarked that the intensity of symptoms is proportional to the rate of pathological change ' and enlarged on this theme It must always be remembered that the curriculum could never be final, there must be continual adjustment and a flexibility suited to the teacher as well as the taught Students should be encouraged to question authority and to study the meaning of the words used by their teachers—words which so often were a cloak for ignorance The teachers for their part must never forget the importance of intellectual honesty and must emphasise the human side of medicine throughout the training The central aim of the curriculum was to prevent the practitioner from being taken by surprise

GENERAL PRACTICE

Dr G O BARBER recalled the medical education he had received twenty years ago and paid tribute to the teachers who had given him a sound knowledge of medicine and surgery None the less, he and his contemporaries had met great and unexpected difficulties when they tried to adapt their hospital training to general practice Why should this be so ? What were the differences between hospital medicine and general practice ? They were, firstly, that a general practitioner had to look after the whole patient in his environment, secondly, that he had to do so without the facilities of a hospital, and, thirdly that his cases were unselected and he must constantly be on the alert to distinguish major from minor disorders There were two diametrically opposed ways of providing a community with medical care It might be provided through large hospitals with all their facilities or it might take the form of care in the patient's own home Dr Barber believed in the latter arrangement and held that the general practitioner should be the instrument of its realisation

Turning to medical education he observed that all teaching could take the form of dogmatic instruction or of practical demonstration the second was the accepted scientific method Twenty years ago he and his generation had been turned out into general practice to sink or swim, and there was no doubt that patients had suffered The young man of today must be guided into general practice, and this was in fact being done at one of the London hospitals where for fifteen years an attempt had been made to prepare the student for this work The course—for such it was—comprised a series of talks by a practitioner on everyday problems and on the common ailments which form 90% of the work visits to a practice in action to meet the dispenser, district nurse health visitor, and other auxiliary workers and a film strip of daily work in general practice Students were also invited to stay a few days on the premises and accompany the practitioner on his rounds and in his surgery This course was well attended and was meeting a very real need

1 See Johnson M I

From Letters to the Editor

Transvesical Prostatectomy—The operation of transvesical prostatectomy described by Mr Lee in your issue of Sept 23 is essentially that first described by Thomson Walker in 1928, except for the primary closure of the bladder which, as Mr Lee says, is now possible because of antibiotics rather than improvements in technique

As he points out one of the major difficulties of the operation is the control of hæmorrhage In a transvesical operation hæmorrhage is most readily controlled by the technique originally described by Wilson Hey and later modified by the Liverpool school (This technique has been admirably described by Stock (*Brit J Urol* 1947 19, 206)) By this method it is possible to obtain an excellent view of the whole prostatic fossa and to pick up and either tie or diathermy all bleeding points under direct vision, thus eliminating all need for gelatin sponge or other hæmostatic agent

In retropubic prostatectomy Millin has controlled hæmorrhage by injecting under the prostatic capsule 0 5 ml of 'Pressin' in 20 ml of 1% procaine I have found that

Dr Robert Mellg Library, L.M. Medical College

effect of the two together was either additive or synergistic When an antibiotic to which a bacterial strain was only moderately sensitive was combined with one of high activity the action of the latter was either impeded or was the same as if it had been used alone

The synergistic effect of two antibacterial substances is readily explained If both interfere at the same stage in a metabolic cycle within the organism, their combined effects may be expected to be additive If, however, their mode of attack on the organism is different, the organisms surviving the action of one become exposed to that of the second, so that the two antibiotics act synergistically Antagonism between two antibacterial substances is not so easily accounted for One possible explanation is that the first produces some change in the cellular structure or metabolic processes of the organism as a result of which the second is either prevented from penetrating the cell, or having done so is unable to exert its usual action

In practice two antibacterial substances might more often be administered together This delays the appearance of resistant strains, and favourable results have already been reported from treating tuberculosis with streptomycin and *p* aminosalicylic acid together, and subacute bacterial endocarditis with penicillin and streptomycin together There is some evidence, too, that a combination of sulphonamides, penicillin, and streptomycin controls *Hæmophilus influenzæ* better than any of these agents alone [9]

PRACTITIONERS' LISTS

THE dispute over the remuneration of general practitioners [10] is closely linked with the question of how many patients a practitioner may have in the N H S In his presidential address on Oct 26 to the Executive Councils' Association of England, Dr N E Waterfield urged that "in the great majority of cases satisfactory service cannot be given, or the objects of the Health Service attained, with lists of more than 3000" The following reasons, he said, were given in favour of keeping the maximum at 4000

1 Under National Health Insurance a practitioner might have under his care a good many more than 4000 when dependants were added to the maximum of 2500 panel patients

2 During the late war many doctors had as many as 6000 patients and usually these doctors fulfilled their obligations

3 Today patients are apparently satisfied with the treatment they get from doctors with large lists and those to whom a transfer is suggested immediately make an outcry

4 Limitation of lists means limitation of free choice of doctor

5 With the existing capitation rate a doctor cannot make a sufficient income without a list in the neighbourhood of the maximum—unless he has other sources of income

Against this, methods of diagnosis and treatment are now increasingly elaborate, and arrangements for radiological and pathological examinations and for consultations with specialists occupy much more time than before the appointed day Furthermore, Dr Waterfield continued, if the new service is to be a real health service, the practitioner must educate the public about health, but obviously with 30–40 people attending morning and evening surgeries and about 20–30 visits a day—which a list of 4000 probably entails—little time can be given to education Also the doctor must have time for reading and attending medical meetings, and for relaxation, amusement, and exercise

How is a reduction to be achieved? If the maximum size of lists were reduced practitioners could justly demand that incomes should be maintained by increasing the capitation fee Without actually imposing a new limit, large lists could be discouraged by heavily loading the fee for the first thousand patients, but unless extra money were added to the remuneration pool the cost would fall on those who now have big lists Loading after this fashion would bring some, though probably not enough, relief to those practitioners—mostly in residential areas—who are suffering hardship Two months ago we suggested that doctors might be attracted to the urban under doctored areas by grants from the Special Inducement Fund [11] and Dr Waterfield proposes that those who are in distress might be helped to transfer by a capital payment or an interest free loan This would enable them to earn a reasonable living and would make for a more rational distribution of medical man power But for both the practitioners and their families evacuation of their chosen places would often be a grim business

9 Zinnemann K *Brit med J* Sept. 23 1950, p 705
10 See *Lancet*, Oct 21 1950 p 483
11 *Ibid* Aug 26 1950 p 327

TUBERCULOUS PLEURAL EFFUSION

PLEURISY with effusion in patients under 40 is almost always tuberculous, but it used to be looked on as a mild and benign manifestation Sibley's [1] study of 200 cases in a Canadian sanatorium suggests that these effusions should be taken more seriously and that many are associated with hæmatogenous spread In 29 of the patients parenchymal lesions of the lung had preceded the effusion, 92 were found to have pulmonary lesions either at the time of their effusion or from a month to seven years later, and 10 subsequently developed clinically recognisable tuberculosis in other organs without involvement of the lungs, in addition, 37 patients developed lesions of hæmatogenous origin, the commonest sites being the genito urinary tract, spine, peritoneum, and meninges

Tubercle bacilli are rarely found in films and still more rarely cultured from the small amount of pleural fluid usually examined But Barnwell [2] pointed out that by culturing a large volume of fluid, up to 500 ml, tubercle bacilli can be detected in about 70% of effusions from young people Cytological examination may also help in diagnosis and should always be included Lymphocytes usually predominate in tuberculous fluids, though a few show a leucocytosis in the early stages MacMurray and colleagues [3] note that fluids with over 5% of eosinophils in their cell-count are sometimes associated with the late stages of tuberculosis but are never one of its early manifestations Schwartz and Broadbent [4] aspirated fluid as soon as it was discovered in 7 patients with artificial pneumothorax, and 6 of the fluids contained 64–90% eosinophils Eosinophilia may also be found in the pleural fluid in cases of lobar pneumonia, typhoid fever, asthma, Lœffler's syndrome, neoplasm of the lung, Bright's disease, and other conditions, but it should always raise a suspicion of tuberculosis Tuberculous effusions mostly occur in patients with a high sensitivity to tuberculo protein, so a negative tuberculin test will virtually exclude tuberculosis except in the extremely ill A positive test, on the other hand will not prove that the effusion is tuberculous, but will call for a full bacteriological and cytological examination

DECISION POSTPONED

DELAYS outside the control both of the Government and of the General Medical Services Committee have prevented the collection of data required for reconsidering the remuneration of general practitioners Accordingly the Annual Conference of Local Medical Committees last week recommended a further three months postponement of the decision whether practitioners should leave the N H S The special conference will be called as soon as the information is available, or next March whichever is the earlier It was generally agreed that if practitioners resign as a body from the service their withdrawal will not be effective unless they withhold certificates from patients wanting them for claiming National Insurance benefits

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Dr Brock Chisholm director-general of the World Health Organisation who has been lecturing in the United Kingdom said at a press conference last week that W H O is a technical body which wages war on disease, he found it hard to justify pacifism on the part of any country in this common cause There has been a great increase in public interest in all United Nations agencies since the outbreak of the Korean war and five public health teams headed by Lieut Colonel Walter Crichton M B have already been sent to Korea to advise on urgent problems of sanitation and on long term reconstruction

The centenary celebrations of Friern Hospital on Oct 27 enabled visitors to obtain an impression both of the hospital's history and of its present activities The austere exterior of the buildings has become increasingly misleading as the interior has been renewed and improved in the spirit of modern hospital care Today as Lady Archibald chairman of the hospital management committee pointed out Friern is a modern hospital just as it was 100 years ago when its foundation marked the transition from the old to the new attitude toward mental illness Mr Arthur Blenkinsop, parliamentary secretary to the Ministry of Health congratulated the hospital upon its very high discharge rate He said that over a quarter of all loss of work is due to mental disturbance and that 48% of the hospital beds in the country are devoted to these illnesses Mr Fred Messer M P chairman of the North West Metropolitan Regional Hospital Board remarked that the ambition of a mental hospital must be to enable its inmates to enjoy life to the fullest measure of which they are capable The programme ended with the showing of a film prepared by the physician superintendent and his staff

1 Sibley J C *Amer Rev Tuberc* 1950, 62 314
2 Barnwell T B Cecil's Textbook of Medicine London, 1947
3 MacMurray F G Katz, S, Zimmerman H J *New Engl J Med* 1950 243 330
4 Schwartz, S, Broadbent M *Trans Amer clinol clin Ass* 1940 55 96

The eighth reunion of the Association of Army Psychiatrists will be held at Slater's Restaurant 142 Strand London W C 2 on Saturday Nov 18 at 7.30 P M. Further particulars may be had from Dr J C Penton 1 Gatehill Road, Northwood Middle-ex

Normally sickness benefit must be claimed within three days of the onset of the disability unless good cause can be shown for failure to do so Under provisional regulations made by the Ministry of National Insurance a patient who is in hospital for not less than three months will be deemed during the first three months to have good cause for failing to notify his incapacity or to claim sickness benefit For the short-stay patient the concession will end three weeks after his discharge from hospital. The concession does not extend to patients admitted or transferred to a home or other institution for convalescence If there have been two or more periods in hospital each separated by not more than three weeks the period of deemed good cause will start at the earliest admission date

Regional hospital boards have been reminded in a Ministry of Health circular (R.H B [50] 105) that any tendency towards too large a professional or staff element in the membership of hospital management committees should be avoided In the Minister's view boards should not appoint a management committee officers as members even of another committee unless there are exceptionally strong reasons for doing so In laying down general principles for the filling of vacancies on committees the Minister last year declared that medical and dental members should normally be derived as implied by the Act from names proposed by the hospital staffs and not from other sources' (R H.B [49] 143 see *Lancet* 1949 ii 951) This it is now explained was not intended to imply the complete exclusion of medical or dental members from other sources Where a Board wish to include a general practitioner among the professional members they will no doubt consider any name put before them by the Executive Council, whom they are in any case obliged to consult or by the Local Medical or Dental Committee

ACADEMIC AND EDUCATIONAL

Empire Rheumatism Council Post-graduate weekend course at Apothecaries Hall, Nov 17–19 Fee 2 gns with application to Gen Secretary Tavistock House (N) Tavistock-square W C.1

Royal College of Surgeons of England Final F D.S examination starts Dec 13 L D.S (Dental Prosthetics and Properties of Dental Materials) Nov 29 (General and Special Anatomy and Physiology) Dec 7

Conjoint Board in England Pre medical examination starts Dec 14 1st (Anatomy Physiology and Pharmacology) Dec 7 Final (Pathology Medicine Surgery and Midwifery) Jan 2

Glasgow University Whole-time Sr Lecturer in Medicine Will be graded Consultant and appointed Asst Phys Western Infy (University Clinical Scale max £2000) Apply to Secretary (closing date Nov 25)

Glasgow University Lecturer in Psychological Medicine (maximum £1500) Apply to Secretary (closing date Nov 15)

London University King's College Lecturer in Physiology (£600–£50–£750) Apply to Registrar (closing date Nov 25)

St Andrew's University James Mackenzie Professor of Child Health in Senior Medical School, Dundee (£2750) Apply to Secretary (closing date Jan 15)

LIST OF HOSPITAL VACANCIES

(Further particulars of appointments available on request to Advertisement Manager)

Acton W.3 —Res H O
Albert Dock Orth & Fnc E 16 —Receiving Room O (Jr Reg)
Bolingbroke S W 11.—H.S (2nd or 3rd post)
Charing Cross Group.—P t Cons Phys (i c Dept Phys Med.) Wembley Hosp
Connaught E.17 —Dep R.S O & Cas O (Jr Reg), H.S
Elizabeth Garrett Anderson, N W 1 —1st H.P (med. & paed.) Female
Finchley Mem N 12 —Res H P (3rd or subsequent post)
German E.S.—H.S H.S (obst. & gyn) 2nd or 3rd post
Hackney E.9 —H P., Cas O (2nd or 3rd post)
Hosp for Sick Children, W C 1 —P t Sr Reg (derm.)
Hosp for Sick Children W C 1 —2 H.P.s (Jr Reg.s) H.S (Jr Reg)
Hosp for Women, W 1.—Res Jr Reg
Lambeth, S.E.11 —Sr Med Reg
London Jewish, E 1.—H.S (H.O)
London Chest, E.2 —Cons Radiol. (Dpt. of Radiol.)
London Chest E 2 —Res M.O (Jr Reg Reg., or Sr Reg.).
London E 1 —P t. Reg (ophth) Peg (anaes)
London Lock W 1 —Reg., P t Sr Reg
Mile End E.1 —H.P (H.O)
Mile End E.1 —H.S (H.O 2nd post) Obst Dpt
National Temperance N W 1 —Cas O (Jr Reg)
National Temperance N W 1 —H.P (gen.)
National Heart, W 1 —Res M.O (Jr Reg or Reg) Male H.P (3rd post) Male, Maid's Moreton, Bucks.
N Middlesex, N.18 —Jr Reg (anaes)
N E Met R.H B —Dep Sr M.O (admin. & exec duties)
N W Met R H.B —Sr Peg (rad)
Paddington W 9 —3 H P.s (gen.) 2 H.S.s (gen.) H.S (obst. & gyn.)
Paddington W 9 —Reg (obst. & gyn) H P (mainly T B)
Poplar E 14 —H.S
Princess Beatrice S W.5 —Obst. H.S & C O (2nd or 3rd post)
Queen Mary's Hosp for E End, E.15 —Res Obst H.S (3rd post)
Queen Mary's Hosp for E End E 15 —P t. Clin Asst to Phys Diabetic Dpt
Putney S W 15 —Pes H P (Male)
Royal Free W C 1 —Orth. Peg (Sr Reg)
Royal London Homœopathic W C 1 —H.S (gyn. & surg) 1st post
Royal Masonic W 6 —Res Jr Med Reg
Royal Northern, N 7 —H.S (2nd or 3rd post)
South London for Women & Children S W 4 —Res M O (Jr Reg) Female
St Peter's & St. Paul's W C.2 —P t Cons Rad
St Charles W 10 —2 H.P.s (gen) H.P (T B) 2 H.S.s (gen.)
St George in the East E 1 —Jr Reg (C O)
St Alfege's S E 10 —H.S (Special & Gen Dpts) 2nd or 3rd post
St Clement's E 3 —H O (Observation Wards & Psych Unit)
St John's S W 11 —Jr Reg (geriatric)
St Mary's W 2 —P t Cons Rad (Princess Louise)
S W Met R H B —Reg E N T (Wandsworth Group)
S E Met R H B —P t Cons Phys (Seamen's Group)
West London W 6 —H.S (gen & gyn) H.S (gen & g u)

Provincial

Ashton Hyde & Glossop H.M.C —H.S (orth)
Aylesbury Royal Bucks —H.S (E N T & ophth)
Aylesbury Tindal Gen —Res Surg O (Jr Reg) Male
Barnsley St Helen.—Jr H M.O
Barrow in Furness N Lonsdale —Res H.S
Barnet Gen —H.S (1st post)
Bath Royal Nat for Rheumatic Diseases —H P
Beckenham Kent —H.S
Bexhill Sussex —H.S (H O 1st post)
Bishop's Stortford & Dist.—Pes H O (1st or 2nd post) Male
Bishop's Stortford Haymeads.—Jr Reg (surg) H O (cas)
Birmingham. Dudley Road.—Surg H O H.O (paed)
Blackpool. Victoria.—H.S (Surg Unit)
Birmingham United. Queen Eliz.—Non res. Med Reg (Reg or Sr Reg)
Birmingham Royal Orthopædic.—Res. H O (2nd or 3rd post) Locum Jr H.M.O
Bovey Tracey Devon. Hawkmoor San —Res H.S (thor surg)
Bradford Royal Infy —Reg (orth.)
Bridgend Gen.—P.S O (orth.) Jr H.M.O., H.P., H S
Bristol United Hosps —Sr Reg (clin path)
Bristol. Winford Orth.—H.S
Bromsgrove Lea Colony —Jr H.M O
Bromsgrove. Barnsley Hall.—Jr Reg
Bromley Kent —H.S H P
Bury Gen.—Jr Anæs Reg
Bury Gen.—Cas O., H.S
Bury Gen.—H P
Bury St Edmunds W Suffolk Gen.—H S (gen surg) H.P (paed & gen med)
Burley in Wharfedale Scalebor Park.—Jr Reg (psych.)
Burnley Gen.—Res H O (med)
Burnley Gen.—Jr E N T Reg
Burnley Victoria.—Jr Orth. Reg
Burton/Trent Gen. Infy —H.S
Colchester Essex County —2 H.S.s
Colchester Mvland —Res H.P
Chertsey St. Peter's —Res. H.S for Gyn. & Special Depts
Canterbury Kent & Canterbury —E.N T & Eye H.S (2nd or 3rd post)
Chester Royal Infy —M.O (Jr H.M.O) orth. & cas.
Cambridge Fulbourn (Mental) —Jr H.M.O (tempy)
Cambridge United Hosps —Res Obst. O (H O) Matr Hosp
Carmarthen West Wales Gen.—H.S., R.S O
Chelmsford & Essex & St. John's.—H.S (Spec. Depts)
Coventry & Warwick.—H.S (gen. surg)
Dewsbury Gen —H.O (derm)
Darlington Mem.—Res Anæs (Jr Reg) C O (H O) E.N T Reg
Doncaster Royal Infy —Jr Reg (E.N T)
Enfield. Chase Farm.—Pes H.S (gen. surg) 1st post Res H.S (gen surg & orth) 1st post, Res. H.P (gen. med. & paed) 1st post
Exeter Royal Devon & Exeter —R.S O (Jr Reg)

this method can also be used successfully in transvesical prostatectomy by introducing the solution through the bladder wall at the junction of the prostate and the neck of the bladder

Transvesical prostatectomy undoubtedly has its place, but in my experience 70–80% of prostates, including most of those weighing 20 g or more, are removed most easily and with the most complete control of hæmorrhage by the retropubic route The transvesical route, with its relatively more difficult visualisation of the prostatic fossa, is reserved for the medium sized gland which is fibrous or infected This route permits of complete diathermy dissection of firm adhesions—a type of case in which manual removal by the retropubic route usually involves such force that the incision in the capsule is excessively torn The small fibrous and the irremovable malignant glands are, of course, treated perurethrally

As regards antibiotics, in the urological fields there is every reason for using "blunderbuss" methods All my cases are treated under an umbrella of sulphonamides, penicillin and streptomycin Streptomycin is known to act very quickly, and unless infection is already present I cannot see the value of administering it, as Mr Lee does, for three days before operation I give the first dose with the preoperative medication and continue it for five days postoperatively (the catheter being removed on the second to fourth day), in this way the maximum effect is obtained at the crucial period

Finally, I must disagree about the necessity for vasotomy In the past two years, of nearly 150 cases on which I have operated only 1, with a grossly infected prostate and bladder, has had a vasotomy Only 2 other cases showed any epididymitis—both due to proteus infection, and both before streptomycin became generally available

Even a relatively soluble product like gelatin sponge, if wrapped round the balloon of a Foley catheter, is partly isolated from the antibiotics excreted in the urine and will thus harbour infection around the torn ends of the ejaculatory ducts and permit retrograde infection This applies also to a Foley catheter alone if the balloon is fully inflated

The methods described here so reduce postoperative hæmorrhage that there is no necessity to introduce foreign bodies into the prostatic fossa, and epididymitis has become a thing of the past —A M MCMASTER, F R C S E (Rochdale)

The Food We Eat —Sir Andrew Aguecheek complained that his wit had suffered through eating too much beef Dr Thrower (Oct 21) blames lack of protein for our laziness An experience of my own seems relevant Four years ago, when the disparity of diets was greater than it is now, I spent some months working in a pathology department in Switzerland With fat and protein in abundance, I soon found myself living, as my colleagues did, on two enormous meals a day The time wasted here on breakfast elevenses, tea, and nightcap all were gained, at first sight, for work But equally soon I found that at the very least two full hours were needed to eat and recover from a midday meal of Swiss dimensions, because of this, in spite of starting at 8 A M, the hours of actual work put in at that Institute were exactly the same in sum as they are at home Little and often keeps the belly light and the head clear —BERNARD LENNOX, M D (Postgraduate Medical School of London W 12)

Distinction Awards —I suggest that the Royal Medical Benevolent Fund would be an excellent recipient of the money from the distinction awards On being informed that one of these had been given to me, my first intention was to return this money to the Ministry of Health This, though satisfying to one s amour propre, is really, an empty gesture The Ministry merely provides the machinery through which these awards are made on the suggestions and recommendations of our own profession Some of us at an early stage considered that distinction awards would be a most remarkable and distasteful method of remuneration, and protested against it We were then told that money had been laid aside for this purpose and could not be used in any other way—in fact that the whole system was already a fait accompli A feeling of inertia is apt to come over one in face of such statements, but I suggest that we are not powerless or incapable of finding some other way of making use of this money for the benefit of the medical profession as a whole There is surely no better way than to aid our less fortunate colleagues and their dependants, nor any better organisation through which to do this than the R M.B F

The shamed secrecy with which these awards are surrounded compels me to adopt anonymity, so I sign myself, like the awards— A B C"

In England Now

ONE returns from Stratford refreshed by the sight of a countryside steeped in English history and bathed in autumnal beauty, and grateful for the opportunity to re examine a fragment of Will Shakespeare's mind, for he was not only a poet and playwright but also a kindly philosopher, keenly aware of, and pondering with vast intelligence and sympathy all those problems of conduct in divers circumstances that afflict mankind This year s feast included *Julius Caesar*, *Henry VIII*, *Much Ado*, and *Measure for Measure* In all four the production, scenery, lighting, and décor were worthy of the author, only the acting left something to be desired—much of this, I thought, barely achieved mediocrity, though a better Pompey and Dogberry than those of Mr George Rose I do not hope to see But how this fashion of underplaying has taken hold of our young actors! Some of them, in their zeal to throw away lines, come near to throwing away the whole play The baby, were it not too magnificently robust, would follow the bath water Mr Quayle's Henry VIII, though it looked more Holbein than Holbein, disappointed by its childish petulance Instead of a great and awe inspiring figure, the king became merely an enfant terrible, more likely to damage the furniture than shape the course of history

* * *

"Many women are convinced that the onset of the 'change' marks not only the end of the child bearing period but the end of her natural desire,' says a helpful little pamphlet I received this morning The many children who have based their hopes of a beating free adolescence on the same theory will be sad to hear that "this is definitely not the case"

* * *

"Are one eyed people seasick?" asked a peripatetic colleague the other week My friend J, the most determined man I know, has sailed small yachts for 30 years, and to him the joy of the game is in leaving one port and reaching another, the time between has always been a nauseous yellow green hell In 1914 he defeated the medicos at his third attempt by learning the Snellen types by heart, he is that sort of man By grim poetic justice a sniper s bullet went in at his left eye and emerged through his right ear Yet four years later he was sailing again, and he has gone on ever since So has his seasickness On our last trip together he brought half a dozen bottles of apple champagne," convinced that this would cure him The bottles remained unopened, for when one is feeling sick there is nothing worse than the smell of apples

News

The next session of the General Medical Council will open on Tuesday Nov 28 at 2 1 M when Prof David Campbell the president will deliver an address

In England and Wales notifications of poliomyelitis in the week ended Oct 21 were paralytic 197 (223) non paralytic 81 (85) total 278 (308) The figures for the previous week are in parentheses

Prof H N Green is to deliver the John Burns lecture to the Royal Faculty of Physicians and Surgeons 242 St. Vincent Street Glasgow C 2 on Wednesday Nov 15 at 5 P M He is to speak on the Fundamental Nature of Shock

On Wednesday Nov 22 at 6 30 P M Sir Lionel Whitby is to deliver the Hastings lecture at B M A House Tavistock Square London W C 1 His subject is to be Can Disease be Prevented? The lecture is open to the public and tickets may be obtained from the public relations department at B M A House

General practitioners staffing the Kingston and Malden Victoria Hospital have announced that they will ignore the management committee s instruction that no further patients shall be admitted after Oct 31 The committee intends to convert this hospital into a gynæcological unit, thus increasing the maternity beds at the nearby General Hospital

The British Postgraduate Medical Federation offers travelling fellowships to doctors training as specialists who hold an appointment or are engaged in postgraduate study at one of the London undergraduate or postgraduate teaching hospitals Applications should be sent to the secretary of the federation, 3 Gordon Square, W C 1 before Dec 1

At a conference in London on Oct 24 Prof A L Goodhart K C pointed out that last year 3955 car drivers had been found guilty of reckless or dangerous driving yet only 358 had been disqualified The feebleness of the magistrates was shown by the fact that the 1682 convictions for driving under the influence of drink or drugs led to only 54 prison sentences without the option of a fine Mr Kingsley Martin editor of the *New Statesman* did not see why withdrawal of licence should not be automatic in many cases and prison be made for dangerous driving

THE SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM*

SIR JAMES LEARMONTH
K.C.V.O., C.B.E., Ch.M. Glasg., F.R.C.S.E.
REGIUS PROFESSOR OF CLINICAL SURGERY AND PROFESSOR OF SURGERY, UNIVERSITY OF EDINBURGH

IN 1937 I reviewed this subject for the *British Journal of Surgery*, at the end of fourteen years of what I then called the modern period of the surgery of the sympathetic system. Another fourteen years have passed, and it may be profitable to consider what changes they have brought in our knowledge and in our practice. I shall not trouble you with statistical data or with many operative details, but I shall try to indicate my present views, especially if they have changed during the last fourteen years. My lecture will therefore be in the most general terms, and its purpose will be one that has, I hope, always guided me—one that I stated on the other occasion when I spoke in this hall (Learmonth 1938).

"I dare say," I said then, "that many of you are familiar with the remark of Claude Bernard's philosophic physiologist concerning the arrangement of the autonomic nervous system, that nature thought it prudent to remove these important phenomena from the caprice of an ignorant will. It is equally important that there should not be any capricious surgical interference with its functions."

Anatomy

In the last fourteen years there have been some notable contributions to our knowledge of the anatomy of the sympathetic nerves, for G. A. G. Mitchell, with patient accuracy, has completed his dissections of the nerves to the abdominal and pelvic viscera (Mitchell 1935a and b, 1938, 1940). Of particular interest at a time when even the most uninformed are ardent controversialists, is Mitchell's (1947) analysis of the origin and distribution of the nerves dealt with in operations for hypertension. His dissections show that after most of the usual procedures sympathetic filaments may still reach the abdominal contents along the aorta and along the œsophagus, in the para-aortic nerves when present, and in the phrenic nerves, and that it is exceedingly difficult to denervate the kidneys completely. On anatomical grounds, he advised, as the optimum procedure, "bilateral resection of the sympathetic trunks from the fourth thoracic to the third lumbar ganglia and removal of the splanchnic nerves." I shall return to this matter when I come to speak briefly about the operative treatment of hypertension.

Another important piece of anatomical work done in the interval is the demonstration by Boyd and Monro (1949) that there may be ganglion cells belonging to the postganglionic neurone of the thoracolumbar outflow in the spinal nerves themselves. Both these cells and their preganglionic connections may escape in the standard operations of sympathectomy. Their presence and their numbers help to account for certain incomplete results which are seen after sympathectomy, and this possibility must be added to the other well known reasons for incomplete results—namely inadequate removal of the nerves concerned and regeneration of sympathetic fibres. Although the great capacity for regeneration possessed by sympathetic fibres has been repeatedly shown in the experimental animal, I am satisfied that of the incomplete results in my own material more should be ascribed to original incomplete removal of nerves than to subsequent regeneration of fibres.

There is one important change of opinion, which has both anatomical and physiological implications. Previously it was thought that after removal of ganglia or division of postganglionic neurones, the muscles of the blood vessels in the denervated territory became oversensitive to circulating adrenaline, and so every endeavour was made to make interruptions of vasomotor nerves preganglionic in level. It is now known that although this sensitisation occurs in animals, it does not occur in man, and particularly in the denervation of the upper extremity there is now no physiological obligation to make a sympathectomy operation preganglionic, although I believe that one should spare the stellate ganglion when possible and so avoid the occurrence of Horner's syndrome.

Finally, largely as the result of the clinical work of J. C. White (1947) our information about the anatomical paths taken by visceral afferent nerves accompanying the thoraco-abdominal outflow has been much extended, and has been given a precision approaching that of our knowledge of somatic innervation. I shall deal with these routes later.

Physiology

The search goes on for sympatheticolytic drugs, but up to the present none tested in my clinic is wholly suitable. To be useful clinically, such a drug must act when given by mouth, must maintain its action over a sufficiently long period, and must not give rise to undesirable side effects, such as a considerable fall in blood-pressure. I feel that limiting the effect of these drugs to a given territory by injecting them intra arterially is not a justifiable therapeutic procedure; in general, reflex methods of producing vasodilatation will be equally efficacious and less trying to the patient, and it cannot be too strongly emphasised that surgery is the only precise therapeutic method of limiting sympatheticolysis that we possess at the present time. Of recent years we have been provided with a great deal of useful information about the physiological effects of sympathectomy on the circulation by Prof. Henry Barcroft and his colleagues (Barcroft and Millen 1939, Barcroft et al. 1943, Barcroft and Edholm 1945, 1946a and b).

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I shall first consider the risks attending operations on the sympathetic nervous system.

I have had one death after cervicothoracic sympathectomy, seventeen years ago. I believe from bleeding because of inefficient control of the superior intercostal artery, although necropsy was refused. I have had three deaths after lumbar sympathectomy: one from gas gangrene of the wound of undetermined origin, fourteen years ago; one on the operating table seven years ago, during a lumbar sympathectomy preliminary to dealing with a large traumatic arteriovenous popliteal fistula, a death for which necropsy did not provide an explanation; and one from acute aortic thrombosis possibly caused by ungentle retraction of the sclerotic aorta six years ago.

My operation mortality for the various more extensive operations I have used in the treatment of hypertension is just under 3% of all cases accepted for surgical treat-

* From the Simpson-Smith memorial lecture delivered in the hall of the Medical Society of London on June 7, 1950.

Epsom Surrey Long Grove —2 Reg s 2 Sr Reg s (psych)
E Anglian R H B —Reg (path), Ipswich Area
Grantham & Kesteven Gen —R S O (Jr H M O)
Guildford Royal Surrey County —Cas O (Jr Reg) E N T H S & Part Cas O
Guildford St Luke's —Res H O (Rad Unit) 2nd or 3rd post
Glasgow Shieldhall Fever —Res M O (H O or Jr H.M.O)
Grimsby Gen —Res Anæs (Jr H.M O)
Hillingdon, Middx —Res H S (gen surg & g u), Male
Hillingdon, Middx —Non res Reg (cas)
Huddersfield Royal Infy —Rad Reg E N T Reg (Jr Reg)
Haverfordwest. Pembroke County War Mem —R.S O H S
Halifax Royal Infy —Res Anæs
Halifax Royal Infy —Jr Reg (surg)
Halifax Gen Jr Reg (surg), H S
Halifax St. John s —H P
Hertford County —Jr Reg (surg)
Hounslow, Middx —Res H S (Special Dpts) 2nd or 3rd post
Hull De la Pole —H O (2nd or 3rd post)
Hull Royal Infy —H S
Isleworth W Middlesex —H O (orth)
Isleworth W Middlesex —Sr Pæd Reg
Keighley & Dist Victoria —H P
Keighley & Dist Victoria —H S
Kettering Gen —H S (traum & orth)
Leamington Spa Warneford Gen — R H S (E N T & ophth), 2nd or 3rd post
Leeds R H B —Reg s (chest diseases), Hull & Bradford, Sr Reg (psych) Menston
Leeds R H B —Psych.s (Sr H M O s) Menston, Leeds, Bootham Park York Storthes Hall, Kirkburton Stanley Royd Wakefield
Leeds R H B —Cons Bact (Hull Royal Infy)
Leeds R H B —Cons Radiol s Harrogate & Ripon Hull A & B & E Riding; Pontefract & Castleford
Leeds R H B —P t Cons Pæd (Huddersfield & Halifax)
Leeds R H B —Cons Path (Goole Howden & Selby Pontefract & Castleford)
Leeds R H B —Cons Bact (Bradford A & B)
Leeds Gen Infy —Reg or Sr Reg (anæs)
Leeds Gen Infy —H O s (ophth & gyn) Reg & Sr Reg (National Radioth Centre)
Leeds United Hosps —R M O (H O), Ida Branch Hosp
Leeds St James s —Jr Reg (orth)
Leicester Markfield San & Isolation — Res Reg
Lincoln County —H O (orth & frac)
Lincoln County —H S (1st post)
Liverpool Royal Southern —Cas O (night duty)
Liverpool City Hosp North —R M O (H O) mainly med
Liverpool Heart —Res H P
Liverpool Chest —Res Jr H.P
Maidstone Preston Hall, British Legion Village —Reg (chest dis)
Manchester R.H B —Cons Path (Ashton Hyde & Glossop)
Manchester R H B —2 Sr Reg s (thor surg) Baguley and Park Hosps
Manchester R H B —Reg (thor surg) Park Hosp
Manchester R H B —Asst Anæs s (Sr H M O s), Barrow and Furness Wigan & Leigh and Wrightington
Manchester R H B —Cons E N T Surg (Oldham & District & Ashton Hyde & Glossop)
Manchester R H B —T B Phys (Sr H M O) Manchester Chest Clinic
Manchester R H B —Cons Chest Phys (Manchester Chest Clinic and Baguley Hosp)
Manchester R H B —Cons Ophth Surg (Blackburn & Dist)
Manchester Baguley —Res Jr Med Reg
Manchester Royal Eye —H S
Mansfield & Dist Gen —Sr H S (aco & orth)
Middlesbrough Poole San —Res Jr Reg
Motherwell Strathclyde (I D) —H O
Norwich Norfolk & Norwich —Sr Cas O (Jr Reg)
Norwich United Hosps —Obst. H S (West Norwich Hosp)
Norwich Jenny Lind Hosp for Children —H S
Nottingham Gen —Aural H.S , Jr Aural Reg , Sr Res C O (H O) 2nd or 3rd post.
Newport, Mon Royal Gwent.—H O (orth) H O (derm & V D), H O (E N T & ophth)
Newport, I W St Mary's —H P H S
Otley Gen —H P
Oxford Warneford & Park —Sr Reg
Oxford R H B —Cons Acid & Orth Surg , High Wycombe & Amersham
Oxford R H B —Cons Phys Med (Swindon Cirencester & Pewsey)
Plymouth S Devon & E Cornwall —H.S (1st post), Greenbank; H S (2nd or 3rd post), Freedom Fields H S s (Devon port) H O (anæs), 2nd or 3rd post Freedom Fields H P (1st post), Freedom Fields H S (cas & frac), Greenbank, Jr Surg Reg
Ramsgate Gen —H S (1st post)
Rochford Gen —Res M O (H O)
Romford, Rush Green —Res H S (gyn & E N T)
Ryde Royal I W County —H S
Salisbury Gen Hosp —Gyn H S , H.P (pæd) Odstock
Salisbury Gen Infy —H S (E N T)
St. Alban s City —Res H P (Med Team), 2nd or 3rd post, Cas O (Male)
St Alban s Hill End —Cons Psych & Supt
Scotland N Eastern R H B —Cons Asst Obst & Gyn (Aberdeen Special & Gen Hosps)
Scotland Western R H B —Sr Reg.s (obst & gyn) Stobhill Hosp Lanarkshire, Glasgow
Scunthorpe & Dist War Mem —Res H O (E N T & rad), Res Orth H O
Sheffield City Gen —Jr Surg Reg
Sheffield Royal Infy —H S (orth)
Sheffield Royal Infy Royal Hosp Units —Non res Reg (clin path)
Sheffield Royal Infy Unit —Non res Surg Reg or Jr Reg
Sheffield Edgar Allen Phys Treatment Centre —Sr Reg
Stamford & Rutland —Cas O & H.P H O (surg)
South Mimms Clare Hall —Surg Reg (thor)
South Mimms, Barnet. Clare Hall —Jr Reg (surg) Thor Unit
Southport Gen Infy —Res H P
Swindon Group —Res Cas O (H O); Res H S (Gen Surg Unit), H O
Shrewsbury Royal Salop Infy —Orth. H S & C O , H P
Shrewsbury Royal Salop Infy /Copthorne —Sr H P (H O 3rd post)
Southampton Group H M C —Jr Reg (E N T)
Stockport Infy —H O (anæs)
Swansea Hospital —Res H S (1st or 2nd post)
Stockton-on Tees Winterton —2 H O s
Virginia Water Holloway San (Mental) — H O (2nd or 3rd post)
Warwick Hosp —2nd Orth H S
Wakefield Clayton —Res H.S Locum Res Surg O (Reg)
Watford Group 9 Lab , Peace Mem — Non res Jr Reg (clin path)
Weymouth & Dist —H.S H P
Winchester Royal Hants County —H.S (orth)
Woodford Essex Claybury —Jr Psych Reg
Wrexham & E Denbigh War Mem — 2 H S.s
York The Retreat —Cons Phys. Supt.
York Maternity —2 Res Obst. H.S.s (2nd or 3rd post)
York. Military (Civilian Wing) —R M.O (2nd or 3rd post)
New Zealand Dunedin —Med Supt.
New Zealand Auckland Hosp Bd.— 2 Radiols (Jr or Sr Specialists)
New Zealand, New Plymouth —Sr Med Specialist (whole or p t.)
New Zealand, Wellington —Sr Med Reg
Northern Ireland Hosps Authy —Cons Surg (Mid Antrim Area)
Paris Hertford British —Asst R M O (H O)

PUBLIC HEALTH

Aberdeen City Corpn —Asst. M O (health & welfare)
Derbyshire C C —Asst. Sch & Asst. Maty & C W.M.O
Essex C C —Asst. Cty M O H (South Essex Health Area)
Foreign Office Admin of African Territories —Sr Surg (Cyrenaica)
Gloucestershire C C —Asst Cty M O H (Male)
Leicester City Health Dept —Sr Asst M O (maty & c w), Female
Luton Borough —Asst M O H (Male)
Northumberland C C —Asst County M.O (maty & c w)
Oldbury Borough & Worcestershire C C — Dep Borough M O H & Dep Cty Div M O & Dep Sch M O
Stoke on Trent Educ C'tee —Asst. Sch M O (Male)
W Sussex C C Littlehampton U D C Worthing R D C —Dist M.O H & Asst C M O (Male)

GENERAL PRACTICE

(Executive Councils Form E C 16A)

Bournemouth —Urban List 3300 Partnership 3 Drs
Cumberland —Urban & Rural List 1160

HOSPITAL NON MEDICAL VACANCY

West Bromwich Hallam —Biochem Asst.

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THE SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM*

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Another important piece of anatomical work done in the interval is the demonstration by Boyd and Monro (1949) that there may be ganglion cells belonging to the postganglionic neurone of the thoracolumbar outflow in the spinal nerves themselves. Both these cells and their preganglionic connections may escape in the standard operations of sympathectomy. Their presence and their numbers help to account for certain incomplete results which are seen after sympathectomy, and this possibility must be added to the other well known reasons for incomplete results—namely, inadequate removal of the nerves concerned and regeneration of sympathetic fibres. Although the great capacity for regeneration possessed by sympathetic fibres has been repeatedly shown in the experimental animal, I am satisfied that of the incomplete results in my own material more should be ascribed to original incomplete removal of nerves than to subsequent regeneration of fibres.

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ment, including what might be regarded as unavoidable deaths—those for example before any operation was done, and those occurring out of hospital or nursing home, in the intervals between operations If one accepts occasional ill fortune, operations on the sympathetic nervous system are safe I turn to their applications

DIVISION OF AFFERENT PATHWAYS

Visceral Pain

Sympathetic denervation for pain originating in viscera has been—and still is—utilised more often on the Continent and in America than in this country, possibly because of the original insistence of British physiologists that the sympathetic system itself was a purely efferent one However a considerable proportion (about half) of the fibres in the splanchnic nerves convey afferent impulses from viscera, some of which are of pain, and there may be, as in the case of the heart and aortic arch, more direct fibres to the ganglionated chains It is clear that effective sensory denervation of a viscus can be secured either (1) if the viscus has a vascular pedicle, by interrupting the nerves accompanying the vessels, or (2) by interrupting a sufficient length of the ganglionated chain, or (3) by division of the appropriate spinal posterior roots

The principle has been most often applied to the treatment of angina pectoris and of dysmenorrhœa, and my own experience has been confined to the former Two procedures are available paravertebral injection of alcohol round the upper four thoracic sympathetic ganglia on the left side, or operative removal of the same ganglia (White and Bland 1948) I now prefer the latter Injections of alcohol are not infrequently followed by troublesome intercostal neuritis The operation can be done quickly and without undue risk, although one must be careful to soak the paravertebral ganglia with procaine solution before beginning to manipulate them White himself, outstanding expert though he is in the technique of paravertebral injection, has come to prefer the open operation, as have also Lindgren and Olivecrona (1947) I used to think that if there were attacks of pain while the patient was at rest, sympathetic interruption was contra indicated—but I am not so sure of this now

Renal Pain

My experience of denervation of the renal pedicle for pain of renal origin is now long past, but my few cases —and I live in daily association with one—lead me to endorse Oldham's (1936) favourable view of the procedure, in properly selected cases

Causalgic Pain

Although in the last war causalgia was less frequent than in the war of 1914–18, a sufficient number of cases accumulated in which the characteristic spontaneous burning pain, started or aggravated by emotional stimuli, left the diagnosis in no doubt While mild examples of causalgia may be expected to clear up without treatment, it is now definitely established that sympathetic denervation of the affected limb, usually preceded by diagnostic paravertebral procaine block, is efficacious in dealing with the pain In a small proportion of cases, repeated procaine block may be sufficient of itself In a series of 22 cases carefully reviewed by my colleague, A J Slessor (1948), in 17 sympathetic denervation permanently abolished the pain and in 2 repeated procaine paravertebral block In the remaining 3 cases spontaneous improvement in the pain has occurred My own more limited experience has been similar

Carotid Sinus Syndrome

The only purpose for which periarterial sympathectomy remains the operation of choice is as the procedure for denervating an oversensitive carotid sinus on one or both sides This denervation deals with any of the three types of attack to which these patients may be prone, characterised either by cardiac arrest, or by widespread vasodilatation or by epileptiform attacks A sufficient number of cases of bilateral denervation have been carefully enough studied—including one by Turner and myself (1948)—to show that the procedure is not followed by any untoward after-effects Recently it has been found that relief from the attacks may also be obtained by intracranial division of the glossopharyngeal nerve on one or both sides (Ray and Stewart 1948), which seems to me on the whole a more formidable procedure than bilateral carotid denervation

Sympathectomy to Modify Visceral Function

I am enough of a diehard to believe that division of their sympathetic nerves has an occasional place in the treatment of congenital dilatation of the ureters, bladder, and large intestine It has to be done early, before the age of three or so, or, more accurately, at least in the case of the urinary tract, before organic changes have occurred in its walls I defend my stubbornness by my experience in a number of cases in which congenital dilatation of the urinary tract and of the large intestine coexisted for I have had some cases in which only one of these was cured by an extensive sympathectomy Why I do not know, nor can I predict which defect will benefit, except that in one of my cases, in which the vesical condition was cured whereas the intestinal remained unaltered, there was a small area of sensory loss in the fifth sacral segment

DIVISION OF EFFERENT FIBRES

Hyperhidrosis

So safe an operation is sympathetic denervation of a limb, that when a patient suffers from hyperhidrosis of the hands or feet interfering with the pursuit of a profession or presenting any social or economic difficulty, operation may be confidently recommended There is a psychological aspect to these cases, which must not be underestimated, and I have been glad to relieve from anxiety patients following so different occupations as medicine, chiropody, and optometry

Ischæmia

Ischæmia may be due to vasospasm, or it may follow any form of interruption of a main or branch artery My accumulated experience has taught me to take a long term view of these cases, and not to be stampeded into operations of so called emergency The physiological effect of sympathetic denervation on the arterial tree of a normal extremity was first studied in detail by Theis (1933) on dogs, and his findings apply to all normally constructed arteries except possibly the largest After ligature of the femoral artery, immediate sympathetic denervation produced an increase of more than 100% in blood flow through collaterals, for the first week Thereafter there occurred a rapid fall until about the eighth week, after which the increase in blood flow remained stable (for at least ten months) at between 40 and 50% higher than its original level We have found that these changes cannot be correlated with return of blood pressure, which is almost complete in forty eight hours Since the volume flow through a vessel varies with the fourth power of its radius, a very small amount of permanent vasodilatation is sufficient to provide for this exceedingly substantial permanent increase in blood flow It may not provide all the blood required by energetically working distal muscles but it is more than ample for the nutrition of the resting limb, because in favourable circumstances the unimproved collateral circulation is quite sufficient for this

Of late years it has seemed to me that too early sympathectomies in cases of relatively acute blockage of

arteries may by their very success in increasing blood-flow remove the "natural" stimulus toward the formation of additional collateral vessels In young patients that may not matter a great deal at the time of the block but the greater the total calibre of the collateral vessels that patients make, the more secure the limb will be in the later decades of life, when obliterative vascular disease is common Therefore I think it wise to tide over most ischæmic emergencies by conservative treatment, which means warmth, rest, and anticoagulant drugs, until natural improvement seems to be at an end In the arm this is usually relatively soon, in the leg it takes up to three or four months, after which I have an idea that, although undoubtedly the formation of collateral vessels continues, it is mostly confined to the short channels which form in any intra arterial organised thrombus, whose only connections, and they are unimportant ones, are with the vasa vasorum Moreover I share White's (1949) experience that when the nutritional state of a distal part is extremely doubtful, immediate sympathetic denervation may precipitate gangrene by increasing œdema about the proximal limits of the doubtful area Therefore when the main artery of a leg or a major branch is interrupted in young people, I believe it to be good judgment to carry out sympathetic denervation of the leg after a suitable interval, as a kind of "old age insurance", the same policy is also usually the best when the patient is older

The end result of denervating an unblocked arterial tree, for example in uncomplicated Raynaud's disease, is approximately the same quantitatively, although not predictable with accuracy In such conditions, after sympathetic denervation the smaller arteries and arterioles of an extremity are left slightly larger, but continually larger, than before operation provided that the patient does not foolishly expose either hands or feet or both to extreme cold or to prolonged cold.

The data in the problem change when general or local arterial disease is present—i.e, in arteriosclerosis, in thromboangiitis obliterans, and in Raynaud's disease as soon as attacks are accompanied by severe blanching In such cases I am accustomed now to pose myself two problems is it possible to get blood *up to* the threatened part, and is it possible to get blood *into* the threatened part? If one can get blood to flow at all through a part which does not vary very much in its demands for blood, it has always surprised me that its minimum requirements should be so small but the blood must keep flowing In patients with the not very uncommon condition of aortic thrombosis, blood flow through the feet may be reduced to as little as 0 6 ml./100 c c m./min as compared with the average normal figure of 2 3 ml./100 c cm /min, without the appearance of any grave nutritional lesions Eleven months after bilateral lumbar sympathectomy for aortic thrombosis we have recorded as high a flow as 3 8 ml./100 c cm /min., which is 65% more than the normal figure Little is known of the basal nutritional requirements of the digits, although from the composition of their tissues it is likely to be small, and the large blood-flow which normally goes on through digits is designed for general temperature regulation rather than for local nutrition Another example of a condition in which quite an adequate flow is maintained to distal parts is widespread calcification of peripheral vessels not complicated by thrombosis, a by no means uncommon finding in clinical practice and sometimes an unexpected one Widespread medial sclerosis may not be associated with diminution of calibre or with loss of continuity of the intima

When one is considering the desirability of sympathetic denervation in cases where the vessels are diseased, I believe that one can practically always decide whether it is possible to get blood *to* a threatened part by determining whether collateral pulses are present or absent In the arm this does not often need a greater familiarity with the arterial tree than is required of a second-year student, although occasionally exceptions occur In the leg the pulses round the knee are important above all the pulse of the anastomotica magna artery, on the anterior aspect of the internal condyle of the femur, is a reassuring sign that a conduit of some size is patent, it should be remembered also that the dorsalis pedis pulse is absent in 12% of normal subjects, its place being taken by the peroneal artery the pulse of which may be felt either in front of the external malleolus or on the lateral surface of the tuberosity of the os calcis The vessels which provide these important pulses can all be dilated by lumbar sympathectomy, as can be shown by observing the return of the pulses about the ankle, or by a marked increase in their force, immediately after operation This procedure may be confidently employed to increase their calibre by an amount which will materially increase the blood flow through them, to an extent that will safeguard the nutrition of the digits of hands or feet

To get sufficient blood *into* a threatened part is often more difficult The extremes of difficulty are provided by the usual finding in diabetic arteriosclerotics, that all the digital vessels of one or more toes are extensively diseased, and by the dorsal ulcer over the tarsal bones, often seen in cases of thromboangiitis obliterans which may be the result of obliteration of *all* the vessels to that area of skin These irreversible conditions cannot be remedied by sympathectomy—amputation is inevitable In general this may be more distal in diabetics than in those suffering from Buerger's disease or from arterio sclerosis I have not been impressed by the results of sympathectomy in reducing the extent of amputations—perhaps because from a psychological point of view, I believe that the first amputation should be the final one Even though at first a lower amputation may seem satisfactory the long term outlook is not good

In my own experience I have found that an increase in claudication distance seldom follows sympathectomy, and that when it does, the distance gained is hardly ever considerable, because the blood debt is usually too great Claudication can be helped in simpler ways.

Certain things I have learned. First, that it is unwise to give an unguardedly good prognosis in any but the earliest cases of Raynaud's disease, for I believe that organic changes in the digital vessels are earlier and more extensive than are generally supposed, and that operation is best avoided in the cases secondary to the use of vibrating tools, or those which appear after digital sepsis Secondly, perhaps my greatest regret now—though I am conservatively minded—is that I used to refuse the possibility of help from sympathectomy to too many patients in the older age groups This is the group in which most complications are to be expected, the most anxious being the occurrence of postoperative pain This is not particularly common, but its incidence is unpredictable It begins some ten to fourteen days after sympathectomy, is worst at night, and lasts from a day or so up to three months or more It takes the form of a dull ache of great intensity, usually deep in the lower third of the thigh, to which may be added hyperæsthesia of the skin of the thigh. It does not conform to any anatomical territory, and its origin is obscure though it is probably a manifestation of ischæmic neuritis None of my five cases occurred in a female, and in none was any unusual operative difficulty encountered Two could be classed as severe The choice between the hope of retaining a patient in this group as a biped, and the dread of postoperative pain for which no treatment except analgesic drugs is available, is a difficult one and must be determined on the merits of

each case And thirdly, the need for dealing with even the smallest of septic lesions before operating

I do not employ paravertebral injections except as therapeutic tests, and as an additional and in my view valuable procedure in the treatment of acute axillary or iliofemoral venous thrombosis

Hypertension

The form of hypertension that has been most often treated by sympathectomy is essential hypertension, possibly persisting after pregnancy Most of the cases in all recorded series belong to that category, and in the absence of any real knowledge of the pathogenesis of essential hypertension, all forms of treatment, including operative treatment, must be entirely empirical It is as wrong to deny to sympathectomy a place in the symptomatic treatment of this condition as it is to claim for sympathectomy a uniformly favourable influence upon its symptoms and progress I know of no rules by which those cases in which a reduction in blood pressure can be hoped for may be confidently selected so my tendency is coming to be to reserve operation for the relief of symptoms and signs, even in cases of so called malignant hypertension If life is also prolonged, it is by the postponement of cerebral vascular incidents I feel strongly that the risks of any such operative treatment should be reduced as much as possible In general this can be done by restricting its scope, and at this point I must return to consider for a moment the views of Professor Mitchell (1947) on the anatomical adequacy of the various operations which have been proposed It will be remembered that Mitchell considered that sympathetic fibres could reach the abdominal viscera around the œsophagus, around the aorta, and in the phrenic nerve, and he advised that the origins of the first two of these additional contributions could be dealt with by extending the operation from the third thoracic to the third lumbar ganglion inclusive, which means a combined thoraco abdominal approach I have never thought it necessary to remove the thoracic chain as high as this I am coming to the view that for the relief of symptoms, which is all that is reasonably certain after the operation, a sub diaphragmatic operation may be sufficient in a large enough proportion of cases to make it the rule In such an operation the fibres which tend to escape division are those destined for the renal plexus from the trunks of the splanchnic nerves and from the aortic and mesenteric plexuses, and dissection of this area shows how complicated the arrangement of these branches may be The best plan to include them is to make a clean dissection of the nerves on each pillar of the diaphragm and of the lumbar sympathetic trunk and its branches, down to the third lumbar vertebra This procedure incidentally avoids the risk of postoperative intercostal neuritis, although in my own thoraco abdominal series of cases this has been a rare complication

One must be prepared to accept disappointments from the operation, and certain possible unpleasant post operative effects The first of these is postural hypotension, which can be very troublesome for the first few months, even up to a year Its occurrence in a marked form is not any guarantee that the blood pressure will not subsequently and even quite rapidly rise to its pre operative level Tachycardia, as a rule postural but sometimes even at rest, may lead to some breathlessness, and pain in the distribution of an intercostal or subcostal nerve exposed at operation, or in the distribution of the genitofemoral nerve in cases where dissection has been difficult, may occasionally be disabling After the more extensive sympathectomies, in my experience in about one fifth of the cases severe attacks of the Raynaud phenomenon in the hands may be most uncomfortable and in extreme cases disabling Bilateral removal of the first and second lumbar ganglia leads to sterility but not to impotence in the male, this is so constant a finding that it can be used to determine the completeness or otherwise of the ganglionectomy About half the patients consider that they are more placid after operation, an improvement which has a beneficial effect on their domestic life and on their social activities Like other investigators, I have found that headache is the symptom which is most improved, the headache disappearing or being improved in over 90% of my cases And no-one can deny that some of the pathological signs—for example papillœdema—disappear at least temporarily after operation

It will thus be seen that one can expect certain hypertensives to be grateful for operation and one can also expect in a proportion of cases that their friends will also be grateful If it is possible to achieve these results by the more limited subdiaphragmatic procedure, the period of hospitalisation and the period of convalescence will be much reduced and the possible physiological and economic results of operation will be so much the better I propose to continue to operate upon a proportion of hypertensive patients I select them myself I refuse those who are symptomless, those who have severe cardiac disease, and those who have cerebral palsies The oldest in my series was 54, which is probably too old, and in a doubtful case I would give the chance of operation to a man rather than to a woman though some men are very depressed after the second side is done Women do better on any treatment I am not always right, but then who is? What matters is that I naturally select patients for operation with all the earnestness and sense of responsibility of which I am capable

Conclusion

The surgery of the sympathetic nervous system should be one continuous observation of hominal physiology, and it is greatly to the credit of our art that in Britain this has been so largely true Indeed I would go so far as to say that it is quite wrong for surgeons to undertake these procedures, unless they have a good basic understanding of the physiological and physical principles that are involved The mere multiplication of operations is useless fifty surgeons who are not physiologically minded will not advance surgical science further than one surgeon who is not physiologically minded At the present time I would define the object of intelligently used surgery of the sympathetic system as *preservation* Sometimes of tissue, even of a limb, sometimes of bodily comfort, sometimes of mental happiness, sometimes, though less often, of life itself

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THE RICE DIET IN THE TREATMENT OF HYPERTENSION

A REPORT TO THE MEDICAL RESEARCH COUNCIL*

IN 1944 Kempner (1944a and b) reported the result of treating a series of patients suffering from renal and hypertensive vascular disease with a rice diet In further papers (1945, 1946, 1948, 1949), he has reviewed the effects of this treatment and has produced impressive evidence of improvement, not only in the level of the blood pressure and in the well being of his patients, but also in such objective findings as heart size, eye ground changes, and electrocardiographic tracings Kempner's results have been confirmed by some (Behrendt and Burgess 1947, Flipse and Flipse 1947, Rosenberg et al 1948, Contratto and Rogers 1948, Lichtwitz et al 1950) and refuted by others (Ayman 1949, Chasis et al. 1949, 1950, Schroeder 1948, Schroeder et al 1949)

At the request of the Medical Research Council, a small committee was formed to carry out in this country a clinical trial of the rice diet This paper presents the results so far obtained in a short term trial There are, as yet, no results of its use over a long period, which might compare with recent reports (Kempner 1949, Kempner et al 1949)

* By a committee with the following members Dr D R CAMERON, physician to the York County Hospital, Dr D M DUNLOP, professor of therapeutics in the University of Edinburgh, Dr ROBERT PLATT professor of medicine in the University of Manchester, Dr M L ROSENHEIM, professor of medicine, University College Hospital, London, and Dr E P SHARPEY-SCHAFER, professor of medicine, St Thomas's Hospital, London Series of cases were observed at all these centres

COMPOSITION OF DIET

The diet used was that described by Kempner (1948), and his directions were closely followed It consisted only of rice, fruit, fruit juice, and sugar or syrup, with added vitamins A supplement of ferrous sulphate was also given to certain patients Patients were encouraged to eat 250–350 g of rice (dry weight) daily, but the exact amount that could be tolerated varied The rice was boiled or steamed in water, with no added salt, milk, or fat Some preferred it served dry, others wet It was flavoured with sugar, lemon juice, or fruit The fluid intake was usually limited to 1 litre in the twenty four hours Such a diet should provide at least 2000 calories per day, containing about 20 g of protein, 5 g of fat, and not more than 150 mg of sodium in the twenty four hours Care was taken to see that no drugs were given unless specially ordered, and that such drugs contained little or no sodium Chemical analysis of a day's diet, the duplicate of that eaten by one of the patients, showed

Sodium	5 27 m.eq (121 mg)
Potassium	49·00 m eq (1 91 g)
Chloride	5 5 m eq (195 mg)
Nitrogen	3 14 g (equivalent to 19 6 g of protein)

A sample menu is given in table I In this, the figures for sodium and chloride have been taken from tables

SELECTION OF CASES

It was decided to select for treatment severe and moderately severe cases of hypertension, whether due to essential hypertension or to chronic renal disease As far as possible, patients were selected who, during at least ten days in hospital on moderate bed rest, showed an average diastolic blood pressure of at least 120 mm Hg The blood pressure was recorded daily by the same observer after the patient had rested quietly in bed for

TABLE I—RICE DIET FOR HYPERTENSION (U C H.), YIELDING 2096 CALORIES

—	Carbohydrate (g)	Protein (g)	Fat (g)	Sodium (mg)	Chloride (mg)
Breakfast					
Grapefruit (prepared) 5 oz	7 5	1 0	tr	2 0	2 0
Boiled rice (dry weight) 2 oz	49 2	3 6	0 6	3 6	15 4
Sugar 1 oz	29 7	tr		0 1	tr
Orange juice 8 oz	21 6	1 6	tr	4 0	2 4
	108 0	6 2	0 6	9 7	19 8
Mid-morning					
Lemon juice 1¼ oz , with water 5 oz	0 6	0 1	tr	0 5	0 8
Sugar ½ oz	14 8	tr		0 05	tr
	15 4	0 1	tr	0 55	0 8
Dinner					
Boiled rice (dry weight) 3 oz	73 8	5 4	0 9	5 4	23 1
Golden syrup ½ oz	12 2	0 05	—	38 3	5 9
Blackcurrants, raw 5 oz	9 5	1 3	tr	4 0	21·0
Added sugar 1 oz	29 7	tr	—	0 1	tr
Black grapes 6 oz	26 4	1 2	tr	3 0	tr
	151 6	7 95	0 9	50 8	50 0
Tea					
Boiled rice (dry weight) 1 oz	24 6	1 8	0 3	1 8	7 7
Sugar 1 oz (for rice and fruit drink)	29 7	tr	—	0 1	tr
Banana slices 1½ oz (added to rice)	8 2	0 45	tr	0 45	33 4
Fruit drink made of					
Orange juice 2 oz	5 4	0 4	tr	1 0	0 6
Lemon juice 2½ oz	1 25	0 25	tr	1 0	1 75
	69 15	2 9	0 3	4 35	43 45
Supper					
Boiled rice (dry weight) 3 oz	73 8	5 4	0 9	5 4	23 1
Sugar ¾ oz	22 2	tr	—	0 1	tr
Fresh peaches 5 oz	13 0	1 0	tr	4 0	tr
Orange juice 8 oz	21 6	1 6	tr	4 0	2 4
	130 6	8 0	0 9	13 5	25 5
Before retiring					
Dessert cherries 5 oz	17 0	1 0	tr	4 0	tr
	491 75	26 15	2 7	82 9	139 55

The figures in this table are taken from those given by McCance and Widdowson (1946)

each case And thirdly, the need for dealing with even the smallest of septic lesions before operating

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One must be prepared to accept disappointments from the operation, and certain possible unpleasant postoperative effects The first of these is postural hypotension, which can be very troublesome for the first few months, even up to a year Its occurrence in a marked form is not any guarantee that the blood pressure will not subsequently and even quite rapidly rise to its preoperative level Tachycardia, as a rule postural but sometimes even at rest, may lead to some breathlessness, and pain in the distribution of an intercostal or subcostal nerve exposed at operation, or in the distribution of the genitofemoral nerve in cases where dissection has been difficult, may occasionally be disabling After the more extensive sympathectomies, in my experience in about one fifth of the cases severe attacks of the Raynaud phenomenon in the hands may be most uncomfortable and in extreme cases disabling Bilateral removal of the first and second lumbar gangha leads to sterility but not to impotence in the male, this is so constant a finding that it can be used to determine the completeness or otherwise of the ganglionectomy About half the patients consider that they are more placid after operation, an improvement which has a beneficial effect on their domestic life and on their social activities Like other investigators, I have found that headache is the symptom which is most improved, the headache disappearing or being improved in over 90% of my cases And no one can deny that some of the pathological signs—for example papilloedema—disappear at least temporarily after operation

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TABLE V—RENAL FUNCTION TESTS BEFORE AND DURING RICE DIET

Test	No of cases	Averages	
		Before diet	During diet
Urea-clearance	28	70%	42 5%
Urea-concentration test	4	3 5 g per 100 ml	2 1 g per 100 ml
Endogenous-creatinine clearance	5	57 ml per min	46 ml per min
Inulin-clearance	3	64 ml per min	43 ml per min
Diodone-clearance	3	280 ml per min	251 ml per min

cases known to have renal insufficiency, there is substantial evidence that renal function becomes impaired while patients are on the rice diet

As is to be expected on so low a protein intake, the blood urea fell in almost every case (table IV) This fall might account for some diminution in the power to produce a urine of high specific gravity, but could not explain the other changes in renal function tests (table V) Thus, in some cases a fall in the inulin and diodone clearances, in others a lowered endogenous creatinine clearance, and in yet others a fall in phenolsulphone phthalein excretion was observed This impaired renal function seems to be reversible, as there was a prompt improvement when the rice diet was stopped

The plasma protein level was well maintained on the diet There was no consistent change in the plasma cholesterol, but, in general, patients with high original levels tended to show a considerable fall, while those with normal or low original figures showed little change There was no correlation between fall in the plasma-cholesterol and fall of blood pressure

ILLUSTRATIVE CASE RECORDS

Case 1 —A married woman, aged 42, was admitted to hospital with severe benign essential hypertension, her chief complaints being headache, palpitations, and breathlessness Her heart was not clinically enlarged, her blood pressure was 230/160 mm Hg, and her eye grounds showed well marked arterial changes but no exudates or hæmorrhages

Her progress on the rice diet is shown in fig 1 Her blood pressure fell from an average of 219/144 to 159/116 The lowest blood pressure reading before starting the diet was 217/135, the lowest while on the diet was 133/97 Her headaches vanished completely and she changed from being a depressed and miserable patient to a cheerful and active person up and about the ward Standard cardiac radiographs suggested some diminution in heart size Her blood urea fell from 30 to 24 mg per 100 ml, and her plasma-cholesterol from 206 to 145 mg per 100 ml Her weight fell by 11 lb The whole of the time she was on the diet she did not complain of headache

Despite the striking relief of symptoms, the patient tired of the diet, and after fifty three days she was put on a low salt diet (1 5 g of sodium chloride per day) During the next four days her weight rose slightly and it appeared that

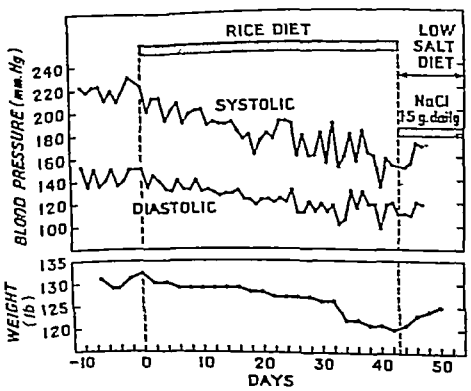


Fig 1—Blood-pressure and weight-curves in case 1

her blood pressure was again rising She returned home on a low salt régime, and when seen some three weeks later, although she was still free of headaches, a casual reading of her blood pressure was 246/155 mm Hg

Case 2 —A married woman, aged 59, had enjoyed good health till six months before admission to hospital, when she began to complain of headaches, which gradually became more severe, persisting throughout the day and making sleep impossible at night without large doses of analgesic and hypnotic drugs She was found to have well marked hypertension, significant left-sided cardiac hypertrophy, and considerable retinal hæmorrhages and exudates The urine was free of albumin and casts, but the concentrating power of the kidney was impaired, giving a urea-clearance of only 30% of normal During the ten-day observation period in the ward on a normal diet, the lowest recorded blood pressure was 180/120 mm Hg During deep sleep under a hypnotic, it fell to 160/100

She was treated with the rice diet for six weeks, being encouraged during this time to be out of bed for the greater part of the day The blood pressure began to fall soon after treatment was started and reached its lowest level of 100/64 at the end of the fourth week (fig 2) Headache disappeared during the second week, and she remained symptom free until the fifth week when she was given, while continuing

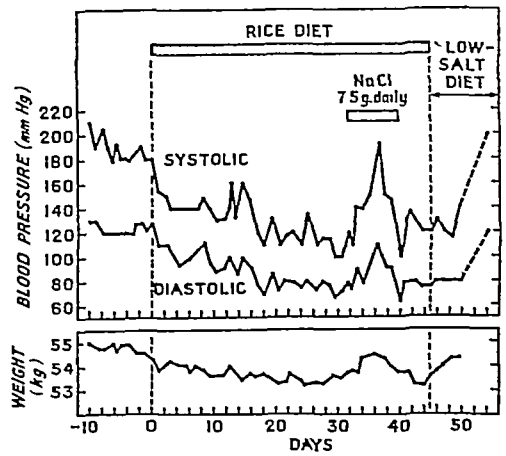


Fig 2—Blood pressure and weight-curves in case 2, showing the effect of added sodium chloride.

the rice diet, 7 5 g a day of sodium chloride in capsules, she was unaware of their content During this week her blood pressure rose sharply to 190/100, and this was associated with a gain in weight of 1 kg and a return of headache During the sixth week, when the added salt was withheld, the blood pressure and body weight fell and the headache disappeared.

Reassessment of the case at the end of the rice-diet period showed decrease in the size of the heart and definite regression of the retinal changes The urea-clearance was essentially unchanged The blood urea nitrogen level had fallen from 13 mg to 6 mg per 100 ml. The patient was then given a low-salt diet containing 2 g of sodium chloride daily The blood pressure showed a tendency to rise during the few days she was taking this diet in hospital She continued to take it with scrupulous care as an outpatient, but when she reported four weeks later her blood pressure had risen to its initial hypertensive level (196/124)

Case 3 —This patient was a man, aged 39, who was admitted in January, 1950 In 1929 he had an attack of acute nephritis and he was again in hospital in 1930 with hæmaturia and albuminuria In 1939 he was rejected for military service on account of some abnormality in his urine He kept well until one year before admission, when he started having headaches which later were associated with nausea and vomiting One month before admission he noticed that vision in his left eye was blurred

On admission he looked ill Examination of his eye-grounds showed that while the discs were well-defined, there was pronounced narrowing of the arteries, arteriovenous nipping, scattered cotton wool exudates and occasional hæmorrhages Clinically his heart was not enlarged, his blood pressure

TABLE II—ANALYSIS OF 41 CASES TREATED

Type of case	Average diastolic blood pressure (mm Hg)				Total no of cases
	120 or over		110–120		
	Male	Female	Male	Female	
Benign essential hypertension	5	19	1	3	28
Malignant essential hypertension	4	2	—	—	6
Renal hypertension	5	1	—	1	7
Total	14	22	1	4	41

at least an hour 5 patients with somewhat lower original diastolic pressures were treated, but these are not included in the analysis of results Table II shows the types of case treated

RESULTS

The diet is unappetising and monotonous, and several patients (not included in table II) were unable to take it for more than a few days It can be made more palatable by careful preparation and presentation, and full cooperation between patient, doctor, and dietitian is required It had been hoped to maintain the diet in each case for at least six weeks The average period spent on the diet, in hospital, was forty one days, with a range of twenty to ninety-five days Patients more willingly persevere once subjective improvement has occurred, but, even so, most are anxious to have the diet altered or stopped before the end of six weeks In a few cases it was gradually modified by the addition of other foods (as recommended by Kempner), but it has not, so far, proved possible to persuade more than a few patients to continue on the diet outside hospital, and most went home on an ordinary low sodium diet

Of 33 patients with symptoms referable to hypertension, 25 (75%) obtained relief Headaches, which were present in 26, disappeared in all but 4, often within a few days of starting the diet

In the majority of patients, the resting blood pressure fell The change in blood pressure can best be appreciated from case histories and charts, but an analysis of the actual readings is given in table III This table shows the average fall in blood pressure recorded in 35 of the 36 patients whose average diastolic pressure during the control period was at least 120 mm Hg (The remaining patient died while on the diet) The comparison has been made between the average blood pressure reading over several days prior to the diet and the average of several days towards the end of the period on the diet The average fall of blood pressure in these 35 cases was 55/26 mm Hg, only 7 had a fall of less than 30 mm Hg in the systolic pressure, and only 8 a fall of less than 15 mm Hg in the diastolic pressure

In 24 patients a barbiturate sedation test was carried out before the diet was started In 10 of these, the daily blood pressure reading while on the diet fell below the minimum reading recorded during the test The test was repeated in 11 patients while still on the diet, and in 7 the blood-pressure fell to a level still lower than the daily reading

TABLE III—FALL OF BLOOD PRESSURE IN 35 CASES ON THE RICE DIET

Type of case	No of cases	Average fall of blood pressure (mm Hg)		Range of fall of blood pressure (mm Hg)	
		Systolic	Diastolic	Systolic	Diastolic
Benign essential hypertension	24	58	25	12–100	6–50
Malignant essential hypertension	6	51	29	23–76	10–46
Renal hypertension	5	49	27	29–80	15–37
All cases	35	55	26	—	—

The blood pressure remained low so long as the rice diet was continued, but rose rapidly on changing to an ordinary low sodium diet, and within a few days or weeks, though symptomatic relief might persist, the blood pressure returned to its original level

The usual low sodium diet contains 1–3 g of sodium chloride in the twenty four hours 11 patients, without other modification of the rice diet, were given capsules containing sodium chloride (the patient usually having no knowledge of the content of the capsules) In 8 of these, the blood pressure rose

In 13 of the patients in whom the blood pressure fell, standard radiographs suggested that the heart size had diminished. Improvement in the electrocardiographic tracings and in the eye grounds occurred in only a few cases

All patients lost weight while on the diet This was readily explained in the 7 patients who had œdema, for this cleared rapidly on the low salt régime In the non œdematous patients, the average weight loss was 9 lb In some the weight tended to become stabilised, but in many there was a steady loss, suggesting that either the caloric or the protein intake was too low

Nitrogen balance studies were carried out in 3 patients (see case 3) Each of these was in a slightly negative nitrogen balance at the end of five or six weeks on the diet To test the effect of protein on the blood pressure, calcium caseinate, which is almost sodium free, was added to the diet of 3 patients In no case did the addition of 40 g daily result in a rise of pressure

TABLE IV—BLOOD UREA (MG PER 100 ML) OF PATIENTS ON RICE DIET

Original level	No of cases	Averages	
		Before diet	Lowest reading on diet
10–40	24	28	22
41–80	3	49	27
Over 80	3	119	74

EFFECT ON BLOOD AND URINE CHEMISTRY

Except in occasional cases the plasma sodium remained within normal limits The plasma-chloride usually fell to the lower limit of normal or even a little below this The excretion of chloride in the urine usually became very low within a few days of starting the diet, and the urinary chloride, expressed as sodium chloride, fell below 300 mg per day Once the patient is stabilised on the diet, the urinary chloride can be used as a check that he is adhering to the régime

The sodium output also usually falls within two or three days to very low levels, often reaching only 50 mg in the twenty four hours, but the occasional patient with renal failure may be unable to control the loss in the urine, and this continuous drain may precipitate dangerous uræmic symptoms 2 patients with impaired renal function continued to excrete sodium in their urine, and one, a case of chronic nephritis, after initial improvement became rapidly worse and died from uræmia One other patient with chronic nephritis went home on a low sodium diet and returned two weeks later, his blood-urea having risen from 48 to 186 mg per 100 ml A similar dangerous loss of sodium may occur if mercurial diuretics are used to accelerate the loss of œdema in a patient on so low a sodium intake In one such case, the plasma sodium fell to 127 m eq per litre (normal 137–147) Quite apart, however, from

TABLE V—RENAL FUNCTION TESTS BEFORE AND DURING RICE DIET

Test	No of cases	Averages	
		Before diet	During diet
Urea-clearance	28	70%	42 5%
Urea-concentration test	4	3 5 g per 100 ml.	2 1 g per 100 ml
Endogenous-creatinine clearance	5	57 ml per min	46 ml per min
Inulin-clearance	3	64 ml per min	43 ml per min
Diodone-clearance	3	280 ml per min	251 ml per min

cases known to have renal insufficiency, there is substantial evidence that renal function becomes impaired while patients are on the rice diet

As is to be expected on so low a protein intake, the blood urea fell in almost every case (table IV) This fall might account for some diminution in the power to produce a urine of high specific gravity, but could not explain the other changes in renal function tests (table V) Thus, in some cases a fall in the inulin and diodone clearances, in others a lowered endogenous creatinine clearance, and in yet others a fall in phenolsulphone phthalein excretion was observed This impaired renal function seems to be reversible, as there was a prompt improvement when the rice diet was stopped

The plasma protein level was well maintained on the diet. There was no consistent change in the plasma cholesterol, but, in general, patients with high original levels tended to show a considerable fall, while those with normal or low original figures showed little change There was no correlation between fall in the plasma-cholesterol and fall of blood pressure

ILLUSTRATIVE CASE-RECORDS

Case 1 —A married woman, aged 42, was admitted to hospital with severe benign essential hypertension, her chief complaints being headache, palpitations, and breathlessness. Her heart was not clinically enlarged, her blood pressure was 230/160 mm. Hg, and her eye grounds showed well marked arterial changes but no exudates or hæmorrhages

Her progress on the rice diet is shown in fig 1 Her blood pressure fell from an average of 219/144 to 159/116 The lowest blood pressure reading before starting the diet was 217/135 the lowest while on the diet was 133/97 Her headaches vanished completely and she changed from being a depressed and miserable patient to a cheerful and active person up and about the ward Standard cardiac radiographs suggested some diminution in heart size Her blood urea fell from 30 to 24 mg per 100 ml, and her plasma-cholesterol from 206 to 145 mg per 100 ml. Her weight fell by 11 lb The whole of the time she was on the diet she did not complain of headache

Despite the striking relief of symptoms, the patient tired of the diet, and after fifty three days she was put on a low-salt diet (1 5 g of sodium chloride per day) During the next four days her weight rose slightly and it appeared that

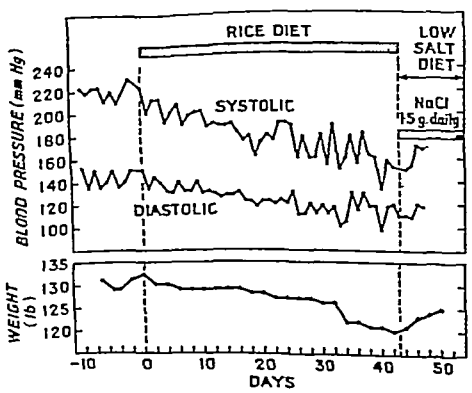
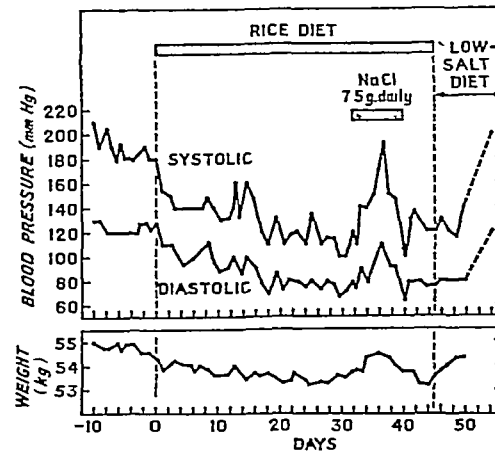


Fig 1—Blood-pressure and weight-curves in case 1

her blood pressure was again rising She returned home on a low salt régime, and when seen some three weeks later, although she was still free of headaches, a casual reading of her blood pressure was 246/155 mm Hg

Case 2 —A married woman, aged 59, had enjoyed good health till six months before admission to hospital, when she began to complain of headaches, which gradually became more severe, persisting throughout the day and making sleep impossible at night without large doses of analgesic and hypnotic drugs She was found to have well marked hypertension, significant left-sided cardiac hypertrophy, and considerable retinal hæmorrhages and exudates The urine was free of albumin and casts, but the concentrating power of the kidney was impaired, giving a urea-clearance of only 30% of normal During the ten-day observation period in the ward on a normal diet, the lowest recorded blood pressure was 180/120 mm Hg During deep sleep under a hypnotic, it fell to 160/100

She was treated with the rice diet for six weeks, being encouraged during this time to be out of bed for the greater part of the day The blood pressure began to fall soon after treatment was started and reached its lowest level of 100/64 at the end of the fourth week (fig 2) Headache disappeared during the second week, and she remained symptom free until the fifth week when she was given, while continuing



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was 220/136 mm Hg His urine contained a small amount of albumin Chronic nephritis was diagnosed Investigations showed that his blood urea was 108 mg per 100 ml, with a maximal urea clearance of 18% His plasma proteins were within normal limits In view of his raised blood urea it was felt that a low protein diet was indicated, and because of his severe hypertension and headaches it was decided to observe the effect of the rice diet

He was unable to eat the full amount of rice The effect of the diet on his blood pressure and his weight is shown in fig 3 Within three days of starting the diet his headaches vanished His blood pressure fell and reached a level of about 150/100 His blood urea fell to 60 mg per 100 ml on the tenth day of the diet and was only 72 mg per 100 ml after five weeks A careful watch was kept on his urinary sodium output, which is also shown in fig 3 It fell rapidly within three days of starting the diet and continued to fall during the first four weeks

During the six weeks on the diet his eye grounds showed well marked improvement until only one exudate and one hæmorrhage were visible Serial electrocardiographs showed no change, but serial standard cardiac radiographs suggested that his heart had diminished in size, though it had been regarded originally as within normal limits His plasma cholesterol remained unaltered at 155 mg per 100 ml, and his hæmoglobin rose from 76% to 94% without the addition of iron to his diet His plasma sodium was 135 m eq per litre after thirty nine days on the diet

After six weeks on the diet a nitrogen balance was carried out During a four day period his daily nitrogen excretion averaged 3 14 g in the urine and 0 95 g in the fæces, giving a total of 4 09 g Exact duplicates of the diet eaten on two of these days was analysed and contained 2 8 and 2 17 g of nitrogen respectively

On the forty eighth day the diet was modified by the addition of a small quantity of meat, potatoes, salt-free bread and margarine, and 1 oz of milk daily It was clear that he would be unable to manage this diet at home, and on the sixty first day he was put on a low sodium diet containing about 500 mg of sodium, according to tables, and 67 g of protein When he left hospital on the seventy second day his blood pressure had risen to 180/114, his blood urea was 132 mg per 100 ml, and there had been a slight recurrence of his headache

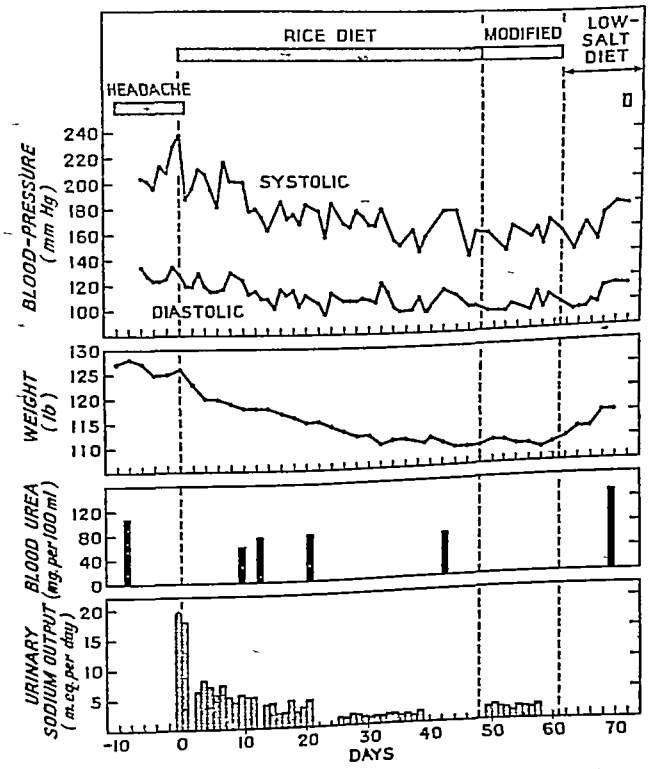

Fig 3—Blood-pressure weight, blood urea and urinary sodium excretion in a case of chronic nephritis treated with the rice diet (case 3)

DISCUSSION

This short term trial of the rice diet has confirmed the claims made by Kempner He reported (1948) that out of 500 patients treated with the diet for periods ranging from four to eight hundred and ninety eight days, 311 showed a fall in blood pressure which averaged 47 mm Hg systolic and 21 mm Hg diastolic The average fall in 35 patients treated by us, over period ranging from twenty to ninety five days, was 55/26 mm Hg

Kempner states that the blood pressure may fall within four days of starting the diet, though a fall may occur only after the diet has been continued for some months He has produced impressive accounts of the continued health of patients who remained on the modified diet for long periods Our experience would suggest that few patients, in this country, could be persuaded to stick strictly to the diet for much longer than six weeks, and further that the home use of the diet or its modification is not easy

It is difficult to appreciate the reasoning which led Kempner to introduce the rice diet Studies of the metabolism of kidney slices in vitro, in the Warburg apparatus, had convinced him (1938) of the importance of the surrounding media for normal cellular metabolism In the belief that abnormal metabolism of damaged renal cells might be responsible for hypertension, he introduced his diet with the object of compensating renal metabolic dysfunction Kempner claims that the diet contains a lower sodium, protein, and fat content than any low sodium, low protein, or low fat diet previously used in the treatment of hypertension, and he regards all these factors as important Most workers, however, now believe that any fall of blood-pressure caused by the diet is the result of the extreme sodium restriction. In several of our cases the addition of sodium chloride to the diet led to a rise in blood pressure (see case 2 and fig 2)

Low sodium diets have long been advocated in the treatment of hypertension, and the subject has recently been reviewed by Bang et al (1949) The results that may be expected and the dangers of this form of treatment were fully discussed by Allen and Sherrill as long ago as 1922 They reported that the blood pressure might fall in a few days or in several months, they regarded the diet as "salt-free" only when the urinary sodium chloride fell to 0 5 g or less per day, and they were well aware that in cases of severe nephritis the sudden withdrawal of salt might precipitate uræmia Their immediate results were impressive, but the régime never became popular, probably because of the difficulty of persuading both doctors and patients of the necessity for such severe salt restriction

It appears unlikely that protein restriction is an effective factor in the diet Schroeder et al (1949) added unsalted meat to the diet of a patient on the rice régime, and we have observed the effect, in 3 patients, of adding 40 g of calcium caseinate (36 g protein) daily for two weeks In no case did the diastolic blood pressure rise significantly Bryant and Blecha (1947), using low sodium diets (200 mg per day) containing 70 g of protein and 80–175 g of fat, obtained results very similar to those of Kempner

By estimating the urinary nitrogen and calculating the dietary nitrogen from tables, Kempner concluded that patients after three months on the rice diet were in nitrogen balance He claimed that the high caloric intake spared protein metabolism His results have been refuted by Schwartz and Merlis (1948) and by Currens et al (1949), but confirmed by his co workers Peschel and Peschel (1950) The 3 patients investigated by us were still in slightly negative nitrogen balance at the end of six weeks In 2 cases followed throughout

their period on the diet, the original negative balance became gradually less pronounced The progressive loss of weight observed in most of our patients may be related to this negative nitrogen balance, to an insufficient caloric intake, or to loss of œdema

Brozek et al (1948) have reviewed the effect of starvation on hypertension, and suggest that a drastic restriction of caloric intake may be as effective as sodium restriction in lowering blood-pressure We have observed a steady fall of blood pressure in patients who maintained their weight after an initial fall during the first few days, so that inanition is unlikely to have been an important factor Similar observations have been made by Flipse and Flipse (1947) The low fat content of the rice diet is presumably responsible for the fall in the plasma-cholesterol in those patients who have an initially high level, but we have found no correlation between fall in blood-cholesterol and fall in blood pressure

Finally, it has been claimed that much of the effect produced by the diet is psychological (Ayman 1949) or is the result of rest after an inadequate period of controlled observation (Schroeder 1948) We are satisfied that these factors cannot fully explain our results Many of our patients were ambulant during treatment, and we have twice observed a satisfactory response to the diet when a thoracolumbar splanchnicectomy had failed to produce a sustained fall of pressure

The danger of the diet requires emphasis Fatal uræmia during treatment has been reported by Schroeder (1948), and we have observed such a case If, in non œdematous patients, the urinary sodium or chloride does not fall to a low level within a few days of starting the diet, the blood urea and blood sodium must be carefully observed.

Impairment of renal function, while on the diet, has been reported (Weston et al 1948, Chasis et al 1949, 1950, Currens et al 1949), and we have confirmed this The glomerular filtration rate is affected to a greater extent than is tubular reabsorption A similar reduction in glomerular function was noted by McCance (1936) in his experiments on salt deprivation in normal man, and Chasis et al (1950) found that the decrease in glomerular filtration rate was abolished by the addition of sodium chloride to the diet The fall in maximal tubular reabsorption of *p* aminohippurate was not improved by sodium chloride, but the level returned to normal on a mixed diet

The rice diet is of great experimental interest, for it may help to throw new light on the relationship of sodium chloride to hypertension, and it provides an elimination diet to which substances may be added to test their effect on the blood pressure We believe that the Kempner rice diet can be expected to produce a considerable fall in blood pressure in about 70% of patients with either renal or essential hypertension, provided that they adhere strictly to the régime This fall is often accompanied by great symptomatic relief Clearly, however, it is extremely difficult for patients to continue on the diet for more than two months, and as soon as the sodium-chloride intake is increased even slightly the blood pressure is likely to rise again It appears, therefore, that this régime will not become a popular form of therapy

Our thanks are due to the Ministry of Food who kindly provided much of the rice and sugar used in this investigation. The study could not have been carried out without the whole hearted assistance of our ward sisters and dietitians We also acknowledge most gratefully the help of our colleagues, and in particular Dr P Arnold (U C.H.), Dr Trevor Kinnear and Dr S Lopis (Edinburgh), Dr G E Milne (Manchester), and Dr A M Blackstock and Mr J H. Blackburn (York)

References at foot of next column

VIRÆMIA IN SMALLPOX

A W DOWNIE
M D , D Sc Aberd
PROFESSOR OF BACTERIOLOGY

K MCCARTHY
M.B Lpool
LECTURER IN BACTERIOLOGY

ALEXANDER MACDONALD
M A., M D Aberd
READER IN BACTERIOLOGY
LIVERPOOL UNIVERSITY

IT is generally accepted that in the smallpox patient virus is distributed to the skin by the blood stream at or just before the onset of illness The clinical course of the illness and histological observations on the skin lesions support this view, and in ectromelia, the natural pox disease of mice, a similar dissemination of virus to the skin occurs (Fenner 1948) The viræmia in smallpox has not been studied by the isolation of virus from cases, although Downie and Dumbell (1947) isolated virus from the blood of a hæmorrhagic case on the fifth day of illness

A sensitive method for the detection of variola virus is provided by inoculation of material on the chorio allantois of developing chick embryos, in this tissue variola virus produces in three days very characteristic lesions which are readily distinguishable from those produced by other viruses The infrequent occurrence of smallpox in this country offers few opportunities for studies of this kind , and, as cases are not often diagnosed before the focal rash appears, material from the pre eruptive stage of illness is seldom available However, we have recently been able to make a few observations on the viræmia in the early stage of the disease and these are reported below For specimens from cases in the Glasgow outbreak of 1950 we are indebted to Dr N R Grist of Knightswood Fever Hospital.

METHODS

All specimens of blood were collected by venepuncture and allowed to clot From three patients blood serum was tested and from two of these blood cells from the clot were also examined separately by inoculation on to the chorio allantois In later cases the small samples of clotted blood were lysed by the addition of equal volumes of sterile distilled water and the lysed specimens examined Approximately 0 1 ml was inoculated into each egg, two to four eggs being used for each specimen After three days further incubation the

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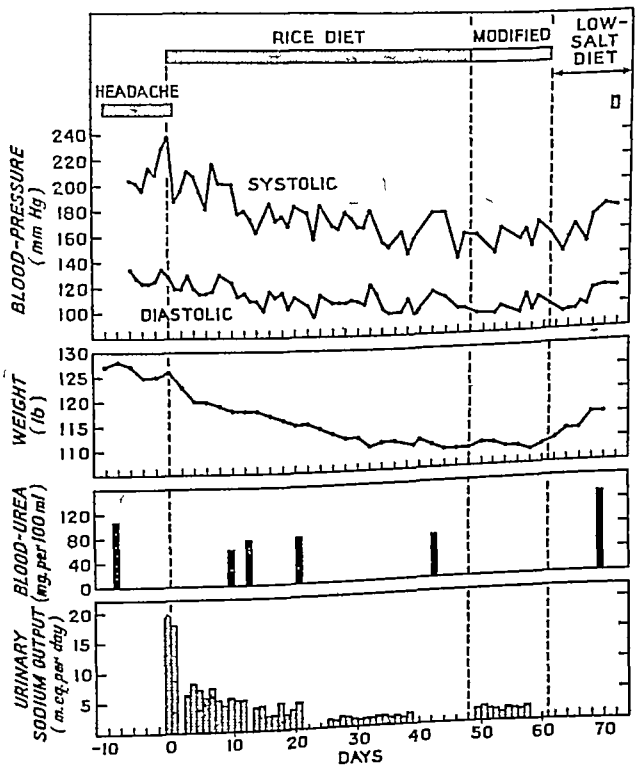

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By estimating the urinary nitrogen and calculating the dietary nitrogen from tables, Kempner concluded that patients after three months on the rice diet were in nitrogen balance He claimed that the high caloric intake spared protein metabolism His results have been refuted by Schwartz and Merlis (1948) and by Currens et al (1949), but confirmed by his co workers Peschel and Peschel (1950) The 3 patients investigated by us were still in slightly negative nitrogen balance at the end of six weeks In 2 cases followed throughout

ie chorio allantoic membrane of the developing hen's egg as a culture medium provided a cheaper and more sensitive method, and, as variola and vaccinia produce different macroscopic lesions in this site, it also provides a specific differential diagnosis

SMEARS

From their experience in the Middle East, where smallpox was endemic, van Rooyen and Illingworth (1944) emphasised the value of the microscopical examination of stained smears of scrapings from papules and the base of vesicles Though this method is valuable under certain conditions, we consider it less reliable in this country, where smallpox may be seen only at intervals of two years or more, and the smears may have to be made by persons unpractised in the technique and not possessing the essential thoroughly clean glass slides At the same time, the repeal of the law for compulsory vaccination in England in July, 1948, increased the importance of the laboratory diagnosis in the early stages as an aid to the control of smallpox Further investigation has shown that, in moderately severe cases, enough material may be obtained by scraping 3 or 4 macules or papules with a scalpel or needle and transferring this to four clean glass slides to provide an antigen which will give a positive reaction with a hyperimmune vaccinia rabbit serum in the complement-fixation test The result of this test is obtained within 24 hours of receipt of the specimens in the laboratory, hence a positive diagnosis may be given before the rash has reached the vesicular stage in the patient If less material than this is obtained, a negative complement fixation test is of doubtful significance, and, until more information is available, reliance must be placed on the egg culture, from which an answer cannot be obtained for 48–72 hours A negative result on the larger amount of material is also only presumptive, and the final diagnosis depends on the egg culture

In this early stage the ideal material for the laboratory is six good smears one for microscopical examination, four for antigen for the complement fixation test, and one for egg culture The use of smears is emphasised because the tests chosen depend entirely on the quantity of material, and the amount of material obtained from the rash at the maculopapular stage can most readily be judged by this method If the lesions are scraped with a needle, this also should be sent to the laboratory In the vesicular or pustular stage, the fluid should be removed from 6–10 lesions into capillary tubes, and smears should be made from scrapings of the base of the lesion In the healing stage, crusts or tops of 10–12 lesions should be collected.

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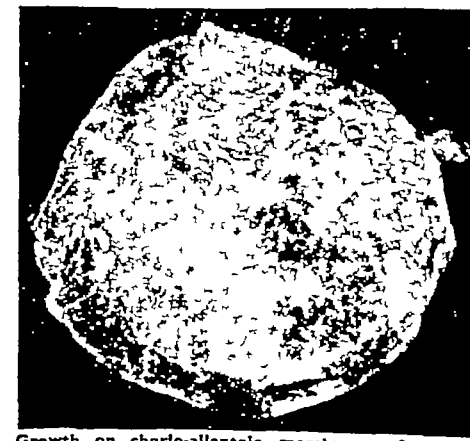
These two cases of smallpox were modified by past vaccination to a degree that would have rendered them dismissible as furunculosis or minor sepsis apart from their presence in s s *Mooltan* In Mr E M a secondary crop of abortive lesions developed after the initial ones had cleared, pustulation occurring on the 4th and 7th days after an initial febrile illness and on the same site —the shoulders Presumably pustulation can occur without evidence of any initial symptoms of malaise in a highly vaccinated person, and one might wonder what degree of scrutiny in the circumstances is necessary for passengers leaving an infected ship What is perhaps essential is that all suspicious skin lesions in contacts should be examined by egg culture and complement fixation, and that in interpreting the word "suspicious" the very high degree of modification which can occur in the presence of partial immunity to smallpox should be borne in mind

VIRUS IN BLOOD

The extreme sensitivity of the egg culture for variola virus suggested that we might apply the method to obtain information about the pathogenesis of smallpox and its infectious period Blood, nose and throat swabs, and skin scrapings were collected from many of the patients who developed smallpox as a result of the case in s s *Mooltan* in April, 1949 Table I shows that virus was recovered from the blood of only two patients. Both cases were of rapidly fatal hæmorrhagic smallpox in which the macules were essentially petechial and few The virus was recovered from Mrs A. on the day of onset of the diffuse erythematous rash, which was the 3rd day of symptoms and the day before death, and from Miss F (see figure) on the day of onset of the erythematous rash, which was the 3rd day of symptoms and within 1 hour of observation of the first macules (she died about 12 hours later) Miss F had only 2 lesions on the face and 6 on the abdomen, from which the smears were made for the complement-fixation test and culture In six other patients cultures of serum and clot were negative (*a*) on the day of onset of illness in one patient, (*b*) on the day of onset of rash in two patients, and (*c*) on the 2nd day in one patient, the 3rd in two and the 4th in one patient All negative chorio allantoic membranes were passed once more and remained negative This suggests that the viræmia is only transitory Although Mrs R had never been vaccinated and died on the 15th day from onset, serum taken on the 5th day of illness neutralised a small amount of virus In the other



Growth on chorio-allantoic membrane of variola virus from 0 1 ml, of serum of Miss F collected on first day of rash

DEMONSTRATION OF VIRUS IN THE BLOOD OF SMALLPOX PATIENTS

Case no	Sex and age in years	Day of illness	Infective units virus in 0 1 ml blood	Nature and extent of rash
1	M 35	5	2 (cells) 5 (serum)	Hæmorrhagic (died 8 days)
2	M 15	1	1	Moderate, discrete
		2	0	
		3	0	
3	M 36	1	0 (serum)	Modified sparse
4	F 20	3	0	Confluent (died 18 days)
5	M 51	2	0	Modified sparse
6	F 11/12	3	2	Modified, sparse (died 6 days)
		4	1	
7	F 17	2	51	Confluent, hæmorrhagic (died 10 days)
		3	7	
		4	0	

eggs were opened and the chorio allantois examined for the presence of visible lesions Lesions were counted and their nature confirmed by subinoculation of the ground up mem branes into more eggs and by histological examination If no lesions were visible on the membranes they were removed, ground with broken glass, and suspended in broth, and the supernatant fluid was inoculated on the chorio allantois of chick embryos If, after three days, these showed no visible virus lesions the result was considered negative

FINDINGS

The findings in individual cases are shown in the accompanying table

Case 1 was a petty officer on board a ship returning to Liverpool from Bombay in 1946 (Pierce 1947) The findings in this case have already been reported (Downie and Dumbell 1947)

Case 2, the brother of a boy who contracted an infection in the laboratory, was under close medical supervision at the time of onset of his illness

No lesions were seen on the chorio allantois in three eggs inoculated with blood taken on the first day of his illness, but these membranes when ground up and inoculated on two further eggs produced numerous typical lesions Specimens taken on the second and third days of illness remained negative on passage This boy had been successfully vac cinated eight days before his illness, but neutralising antibody to variola virus could not be detected in his blood-serum taken on the first and third days of illness Swabs taken from this patient's throat on the first and second days were examined for virus, the swabs were extracted with a small amount of broth, and penicillin and streptomycin were added to the extract before it was inoculated on to the chorio allantois of 12-day chick embryos After three days no lesions were seen on the membranes, which failed to produce variola infection on further passage On the third day of illness when a faint macular rash was present on the face there were eight well developed lesions on the dorsum of the patient's tongue, but a swab was not taken from the throat at this time, when virus was certainly present

The last five patients from whom specimens of blood or serum were available were infected in the Glasgow outbreak (Laidlaw and Horne 1950) Case 4 had not been successfully vaccinated and suffered from a fatal infection with confluent rash, but virus was not isolated from 0 2 ml. of blood collected on the third day of illness Case 6 was an unvaccinated child suffering from congenital toxoplasmosis It will be noted that in case 7 the amount of virus in the blood apparently diminished from the second to the fourth day

DISCUSSION

The findings summarised in the table indicate that virus can be detected in the blood in the pre eruptive stage of smallpox, particularly in severe infections Even in these cases, however, it would seem that the virus diminishes in amount after the first few days of illness That antibody in the blood is not necessarily responsible for the disappearance of virus is suggested by the absence of antibody on the third day of illness in case 2 who had been successfully vaccinated eight days before he became ill It seems likely that in the average case of smallpox antibody appears at the time when the rash vesicular, the temperature falls and the general of the patient improves We have, however, made observations at this critical period although we been able to demonstrate antibody in the serum cases after eight to ten days' illness Although we have no data on the time of appearance of viræmia in relation to the onset of illness, it seems unlikely that there is general dissemination of virus to the skin before the temperature rises The observations of Dixon (1948) on intra uterine infection in smallpox suggest "that transplacental infection occurs during the pre-eruptive fever and not before"

The only other finding which seems to call for comment was the failure to isolate virus from swabs in case 2 on the first and second days of illness If these findings, relating only to one case, should be confirmed they would support the view held by some epidemiologists (Stallybrass 1949) that many cases of smallpox, although not all, do not become infectious until the focal eruption appears, at which time lesions in the mouth and pharynx are beginning to break down and discharge virus This view, which is supported by the observations of MacCallum et al (1950), might explain in part the absence of a third wave of cases in the 1950 Glasgow outbreak In this outbreak the secondary cases occurred in hospital contacts and were promptly diagnosed and isolated in the early stages of their disease, perhaps before they had become highly infectious

SUMMARY

Smallpox virus was isolated from the blood during the first few days of illness in four of seven patients from whom blood was examined Of these four patients three subsequently died of their infection From these observations it would appear that virus is most likely to be found in the blood in the first days of the pre eruptive fever Virus was not detected in throat-swabs taken from a moderately severe case on the first and second days of illness

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LABORATORY INVESTIGATION OF SMALLPOX PATIENTS WITH PARTICULAR REFERENCE TO INFECTIVITY IN THE EARLY STAGES

F O MACCALLUM
M.D Toronto
DIRECTOR, VIRUS REFERENCE LABORATORY, PUBLIC HEALTH LABORATORY SERVICE, COLINDALE

C A MCPHERSON
M B St And, D P H
DIVISIONAL MEDICAL OFFICER, SURREY COUNTY COUNCIL, WOKING

D F JOHNSTONE
M.R C.S, D.P.H.
MEDICAL SUPERINTENDENT, ISOLATION HOSPITAL, PLYMOUTH

UNTIL quite recently the laboratory diagnosis of smallpox consisted mainly in (1) a complement fixation test using a positive vaccinia rabbit serum to detect antigen in vesicle or pustule contents or crusts, and (2) culture of the virus from similar sources on to the scarified cornea of a rabbit's eye The complement fixation test will not distinguish between variola and vaccinia, but separates both from chickenpox In most laboratories the rabbit cornea culture method was successful in only about 50% of cases and again did not distinguish between the two viruses The introduction of

chorio allantoic membrane of the developing hen's egg as a culture medium provided a cheaper and more sensitive method, and, as variola and vaccinia produce different macroscopic lesions in this site, it also provides a specific differential diagnosis

SMEARS

From their experience in the Middle East, where smallpox was endemic, van Rooyen and Illingworth (1944) emphasised the value of the microscopical examination of stained smears of scrapings from papules and the base of vesicles Though this method is valuable under certain conditions, we consider it less reliable in this country, where smallpox may be seen only at intervals of two years or more, and the smears may have to be made by persons unpractised in the technique and not possessing the essential thoroughly clean glass slides At the same time, the repeal of the law for compulsory vaccination in England in July, 1948, increased the importance of the laboratory diagnosis in the early stages as an aid to the control of smallpox. Further investigation has shown that, in moderately severe cases, enough material may be obtained by scraping 3 or 4 macules or papules with a scalpel or needle and transferring this to four clean glass slides to provide an antigen which will give a positive reaction with a hyperimmune vaccinia rabbit serum in the complement-fixation test The result of this test is obtained within 24 hours of receipt of the specimens in the laboratory, hence a positive diagnosis may be given before the rash has reached the vesicular stage in the patient If less material than this is obtained, a negative complement fixation test is of doubtful significance, and, until more information is available, reliance must be placed on the egg culture, from which an answer cannot be obtained for 48–72 hours A negative result on the larger amount of material is also only presumptive, and the final diagnosis depends on the egg culture

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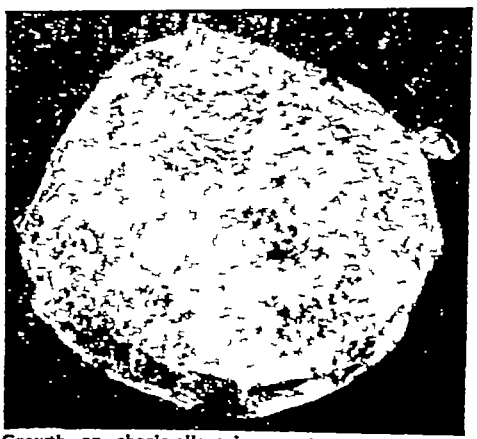

Growth on chorio-allantoic membrane of variola virus from 0 1 ml of serum of Miss F collected on first day of rash.

patients, most of whom had been vaccinated or revaccinated from 35 years to 7 days before the collection of blood, neutralising antibody might have masked any circulating virus at the time of testing, although it appeared too late and was of insufficient strength to prevent viræmia, illness, and death

The serum of Miss F, when first tested after 5 months' storage at + 4°C, had 50 living virus particles per 0 1 ml After it had been heated at 58°C for 30 minutes in a water-bath, no virus was detected, but the serum gave a positive reaction to a dilution of 1/320 when tested as antigen in the complement fixation test against a positive vaccinia serum No neutralising antibodies for vaccinia or variola were detected in this heated serum, although the patient had been vaccinated 7 days earlier This suggests that the blood of previously unvaccinated smallpox contacts might be examined in the pre eruption stage for antigen in the complement fixation test, as well as for virus in egg culture, so as to obtain an earlier diagnosis

VIRUS IN NOSE AND THROAT SWABS

It is unanimously agreed that virus is present in crusts and the last "seeds" from smallpox lesions, and the virus has been shown to survive for a long time in such material away from the body Scott and Simon (1923), using a scarified rabbit cornea, reported isolation of variola virus from nasopharyngeal secretions collected on the 23rd and 31st day of disease in two patients, when the skin lesions had already disappeared in each case Similar results were reported by Friedemann and Gins (1917) We have not found any further satisfactory reports confirming their results, and did not examine material after the skin lesions had cleared These findings are not supported by epidemiological observations and have been disregarded in quarantine regulations

Arising out of these investigations is the question when and why patients are infectious in the early stages of smallpox Although in a few countries patients are considered to be infectious in the incubation period, almost all workers consider that infectivity is greater in the pre eruption period and during the first appearance of the rash Cases are on record of infection contracted from patients who died before they developed a focal eruption, but one wonders whether oral lesions were looked for in these cases With this in mind, we thought it would be relatively easy to recover virus from nose and throat swabs or garglings To our surprise we obtained the results seen in table I Positive results were obtained only in two patients one on the 2nd day of the rash, and one on the 3rd day, when ulcerating lesions were probably present in the mouth Garglings and nose and throat swabs collected from two patients 4 and 3 days before the appearance of rash, from one patient 1 day before, two on the same day as the first rash, two on the 2nd day, and one on the 3rd day of rash, were all negative All negative membranes received another passage and were negative A very small amount of virus was recovered from a swab inserted through a cannula into the lung of Mrs A after death, this might have been due to contamination from blood or skin during manipulation (These results are in marked contrast to the 50% recovery rate of poliomyelitis virus from the pharynx of patients in the early stages of that disease, the comparatively insensitive monkey being used for test culture) The egg culture was capable of detecting 2–3 living virus particles, hence these patients with negative cultures were either not excreting virus at all or were doing so only intermittently Possibly some inactivator may be present in some salivary secretions None of these patients gave rise to known secondary cases except Mrs B who infected her husband and their daughter, both of whom were unvaccinated at the time of exposure

DISCUSSION

How can we interpret these results in relation to infectivity of the patient in the early stage of smallpox? When variola was inoculated intradermally for vaccination in the pre Jenner vaccination period, the incubation

TABLE I—RESULTS OF EGG CULTURE AND COMPLEMENT-FIXATION TESTS

Patient	Vaccination history	Egg culture									Complement-fixation test on smear from early lesions
		Blood		Nose swab		Throat swab		Garglings	Skin scrapings or lesion		
		Day of disease	Result	Day of disease	Result	Day of disease	Result		Stage	Result	
Mrs A	Day of onset	2	Serum + Clot +	2	–	2	–	N.D	Papule	+ve	N D
Mr H	Infancy and day before onset		N.D	3	–	3	–	N D	Papule 1 smear	+ve	Smear of 6 +ve
Miss F	5 days before onset	3 (1st day rash)	Serum + Clot +	3	–	3	–	N.D	Papule 1 smear	+ve	Smear of 5 +ve
Miss W	2 days before onset	4	N D	6 (3rd day rash)	–	6	+	N D	Early vesicle smear	+ve	1 smear –ve
Mrs J	Infancy, 20 years and 9 days before onset	3	Serum – Clot –	3	–	3	+	N D	Papule Smear	+ve	N D
Miss L	9 days before onset	4	Serum – Clot –	4	–	4	–	N D	Papule 1 smear	+ve	N D
Mrs R	Unvaccinated	5	Serum – Clot –	N.D		N.D		N.D	Papule 1 smear	+ve	2 smears +v
Mr M.	Infancy 8 years and 6 days before onset	N D		N D		N D		N D	1 smear of pustule	+ve	N D
Mr B	3 and 5 years and 5 days before onset		N.D	5	–	5	–	N.D	1 smear (only 3–4 lesions)	+ve	N D
Mr W	Infancy 3 times 1914–18 and 2 days before onset	7	N D	5	–	5	–	N D	1 smear	+ve	N D
Mrs B	Unvaccinated	6	Serum – Clot –	N D		N D		N D	Papule 1 smear	+ve	N D
Mr B	7 days before onset	Onset	Serum – Clot –	4 days before	–	4 days before	–	–	Papule 1 smear	+ve	N D
Miss B	5 days before onset	3	Serum – Clot – N.D	3 days before 4 days before 3 days before	– – –	3 days before	– – –	N D	1 smear	+ve	3 smears +ve

N D = not done

TABLE II—SEROLOGY OF CONTACTS

Subject	Age (yr)	Interval(s) from vaccination(s) to present exposure	Vaccine reaction	Interval from vaccination (exposure) to bleeding	Neutralisation test	
					Variola	Vaccinia
Miss F	35	5 days	Take			
D F	60	60 yr 32 yr (no take), 5 days	Healing pustule	11(6)	2+	2+
W.M.	53	53 yr, 35 yr —2 days	Pustule	4(6)	2+	2+
M.M.	55	55 yr —2 days	Accelerated vesicle	4(6)	2+	1+
V.M	24	24 yr 6 yr —2 days	Accelerated papule	4(6)	3+	3+

Serum of Miss F when tested after storage for 16½ months at 4°C contained no hæmagglutinin for vaccinia susceptible fowl erythrocytes but had an inhibitor titre of 1 8 against four hæmagglutinating doses of vaccinia, using 0 5% cells and 0 1 ml. unit volumes

period was only 7–8 days In monkeys a clinical illness simulating variola inoculata was seen when the virus was inoculated into the skin or mucosa of the mouth or trachea (Councilman et al, 1905) This can rarely happen in natural variola infection in man, but is seen in Kaposi's varicelliform eruption of vaccinial origin and in generalised vaccinia after primary vaccination, which resembles ectromelia or mousepox Thus, although Fenner (1948) has suggested that experimental ectromelia might be studied to learn more of the pathogenesis of the acute exanthemata, it is not the ideal model It is generally believed, and we agree, that the variola virus is usually inspired into the lung, where the primary focus or lesion develops Possibly such a lesion usually breaks through into the capillaries but sometimes also externally, virus being emptied into the bronchi, and thus a large amount of virulent virus is expelled in a relatively short time in the febrile pre exanthem period In a large proportion of cases, however, this does not happen, and the patient only becomes infectious when, as a result of the viræmia, lesions appear on the palate, tongue, pharyngeal, or buccal mucosa These then break down, and virus is freed into the oral cavity

The work of Councilman et al (1905) seems to support our hypothesis First, they found no primary lesion or protopustule in the trachea of fifty two fatal cases of human smallpox, and in their experiments on monkeys they only produced a disease resembling variola when dried powdered pustular material inserted in a tube past the larynx was inspired into the finer bronchi Two of the five monkeys thus inoculated developed pneumonia None of five that received dried crusts by the same method developed any signs of illness This seems one possible explanation of the fact that some patients appear to have caused multiple infections in a short time before the appearance of their rash, whereas others have had a large number of contacts up to the second day of rash without causing any obvious secondary cases Perhaps inspired virus might lodge in traumatised mucosa of the pharynx, larynx, or trachea and cause a primary lesion there, which might be a source of infection as well as a source of viræmia

An example of lack of infection in possibly susceptible contacts to a severe case is the case of Miss F (table II) In the house where she stayed she was in close contact with three elderly persons, of whom at least two had not been vaccinated for 35–55 years and were in a susceptible state, as indicated by their reaction to revaccination although their sera contained some neutralising antibody by the fourth day after revaccination Although Miss F was potentially highly infectious, with a very large amount of virus circulating in the blood and in the skin, no virus was recovered from her nose and throat, and no secondary cases arose Blood and nose and throat swabs were collected from the four household contacts on the 4th, 5th, 8th, and 11th days after onset of rash in Miss F and examined for virus with negative results

Similar results were observed and obtained in connection with household contacts of Mr H and Mr W (table I), who were not removed from their environment until after the appearance of the rash

Another possibility concerning the pathogenesis of smallpox is that virus passes from the nose and throat in the lymph to the adjacent lymph glands, where it multiplies before passing to the blood stream and thus to the lung and spleen The virus may further multiply in the spleen, which then sheds virus into the blood stream for the true viræmia, as suggested by Fenner (1948) in ectromelia

SUMMARY

Variola virus has been recovered by egg culture from the blood in two rapidly fatal cases of smallpox on the day before and the day of onset of the discrete rash

The virus was not recovered from the blood of five other patients during the first few days of the rash

The virus was recovered from a throat swab collected on the 2nd day of the rash in one patient and the 3rd day in another Single nose and throat cultures were negative in eight other patients during the pre eruption stage or first few days of the exanthem

The results of these investigations emphasise the value of early recognition, particularly in the maculo papular stage, and isolation of suspected smallpox patients Although we have failed to recover virus from the nose and throat of a few patients in the febrile pre eruption stage and first few days of rash, incontrovertible epidemiological evidence indicates that some patients are infectious at that stage A possible explanation for this is discussed

As no satisfactory antibiotic has yet been found for these viruses, gamma globulin, prepared from the serum of recently vaccinated persons or convalescent smallpox patients, should be given to household contacts who have not been vaccinated or have only been vaccinated in infancy long ago

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EFFECT OF CORTISONE ON EARLY FIBROSIS OF THE LIVER IN RATS

K ATERMAN
M.D, M.R C.P, D C H.
COMMONWEALTH FELLOW, UNIVERSITY OF CHICAGO

IN a study of the regeneration of the liver of rats, it was thought desirable to see whether 'Cortisone' can influence the process of experimentally induced hepatic fibrosis If there were any such influence it might be expected to shed light on the relations of connective tissue and the regenerative capacity of hepatic cells It was also hoped to define more clearly the remarkable effects of cortisone, particularly since the liver is a most favourable site for such an analysis This follows from the relative simplicity of hepatic sinusoids, consisting as they do of but one type of cell (sinusoidal cell) and a basement membrane of ground substance in which is embedded but one type of fibre (reticular)

MATERIAL AND METHODS

Twenty female Sprague Dawley rats, weighing about 125 g, were fed *ad lib* with Purina chow They were injected with carbon tetrachloride according to the schedule of Cameron and Karunaratne (1936) Data on

patients, most of whom had been vaccinated or revaccinated from 35 years to 7 days before the collection of blood, neutralising antibody might have masked any circulating virus at the time of testing, although it appeared too late and was of insufficient strength to prevent viræmia, illness, and death

The serum of Miss F, when first tested after 5 months' storage at + 4°C, had 50 living virus particles per 0 1 ml After it had been heated at 58°C for 30 minutes in a water-bath, no virus was detected, but the serum gave a positive reaction to a dilution of 1/320 when tested as antigen in the complement fixation test against a positive vaccinia serum No neutralising antibodies for vaccinia or variola were detected in this heated serum, although the patient had been vaccinated 7 days earlier This suggests that the blood of previously unvaccinated smallpox contacts might be examined in the pre eruption stage for antigen in the complement fixation test, as well as for virus in egg culture, so as to obtain an earlier diagnosis

VIRUS IN NOSE AND THROAT SWABS

It is unanimously agreed that virus is present in crusts and the last "seeds" from smallpox lesions, and the virus has been shown to survive for a long time in such material away from the body Scott and Simon (1923), using a scarified rabbit cornea, reported isolation of variola virus from nasopharyngeal secretions collected on the 23rd and 31st day of disease in two patients, when the skin lesions had already disappeared in each case Similar results were reported by Friedemann and Gins (1917) We have not found any further satisfactory reports confirming their results, and did not examine material after the skin lesions had cleared These findings are not supported by epidemiological observations and have been disregarded in quarantine regulations

Arising out of these investigations is the question when and why patients are infectious in the early stages of smallpox Although in a few countries patients are considered to be infectious in the incubation period, almost all workers consider that infectivity is greatest in the pre eruption period and during the first appearance of the rash Cases are on record of infection contracted from patients who died before they developed a focal eruption, but one wonders whether oral lesions were looked for in these cases With this in mind, we thought it would be relatively easy to recover virus from nose and throat swabs or garglings To our surprise we obtained the results seen in table I Positive results were obtained only in two patients one on the 2nd day of the rash, and one on the 3rd day, when ulcerating lesions were probably present in the mouth Garglings and nose and throat swabs collected from two patients 4 and 3 days before the appearance of rash, from one patient 1 day before, two on the same day as the first rash, two on the 2nd day, and one on the 3rd day of rash, were all negative All negative membranes received another passage and were negative A very small amount of virus was recovered from a swab inserted through a cannula into the lung of Mrs A after death, this might have been due to contamination from blood or skin during manipulation (These results are in marked contrast to the 50% recovery rate of poliomyelitis virus from the pharynx of patients in the early stages of that disease, the comparatively insensitive monkey being used for test culture) The egg culture was capable of detecting 2–3 living virus particles, hence these patients with negative cultures were either not excreting virus at all or were doing so only intermittently Possibly some inactivator may be present in some salivary secretions None of these patients gave rise to known secondary cases except Mrs B who infected her husband and their daughter, both of whom were unvaccinated at the time of exposure

DISCUSSION

How can we interpret these results in relation to infectivity of the patient in the early stage of smallpox? When variola was inoculated intradermally for vaccination in the pre Jenner vaccination period, the incubation

TABLE I —RESULTS OF EGG CULTURE AND COMPLEMENT FIXATION TESTS

Patient	Vaccination history	Egg culture									Complement-fixation test on smear from early lesions
		Blood		Nose swab		Throat swab		Garglings	Skin scrapings or lesion		
		Day of disease	Result	Day of disease	Result	Day of disease	Result		Stage	Result	
Mrs A	Day of onset	2	Serum + Clot +	2	—	2	—	N.D	Papule	+ve	N D
Mr H	Infancy and day before onset		N D	3	—	3	—	N D	Papule 1 smear	+ve	Smear of 6 +ve
Miss F	5 days before onset	3 (1st day rash)	Serum + Clot +	3	—	3	—	N D	Papule 1 smear	+ve	Smear of 5 +ve
Miss W	2 days before onset	4	N D	6 (3rd day rash)	—	6	+	N D	Early vesicle smear	+ve	1 smear —ve
Mrs J	Infancy, 20 years and 9 days before onset	3	Serum — Clot —	3	—	3	+	N D	Papule Smear	+ve	N D
Miss L	9 days before onset	4	Serum — Clot —	4	—	4	—	N D	Papule 1 smear	+ve	N D
Mrs R	Unvaccinated	5	Serum — Clot —	N D		N D		N.D	Papule 1 smear	+ve	2 smears +v
Mr M.	Infancy 8 years and 6 days before onset	N D		N D		N D		N D	1 smear of pustule	+ve	N D
Mr B	3 and 5 years and 5 days before onset		N D	5	—	5	—	N D	1 smear (only 3–4 lesions)	+ve	N D
Mr W	Infancy 3 times 1914–18 and 2 days before onset	7	N D	5	—	5	—	N D	1 smear	+ve	N D
Mrs B	Unvaccinated	6	Serum — Clot —	N D		N D		N D	Papule 1 smear	+ve	N D
Mr B	7 days before onset	Onset	Serum — Clot —	4 days before	—	4 days before	—	—	Papule 1 smear	+ve	N D
Miss B	5 days before onset	3	Serum — Clot — N.D	3 days before 4 days before 3 days before	— — —	3 days before	— — —	N D N D	1 smear	+ve	3 smears +ve

N D = not done

could be interpreted in a similar manner The particular disposition of connective tissue at any one time might be regarded as the resultant of an equilibrium state between the deposition and the removal of connective tissue In progressing fibrosis this equilibrium is presumably disturbed, so that connective tissue is not being removed as rapidly as it is being formed When this excess is removed—for instance under the influence of cortisone—the original state of equilibrium can be resumed only if, during the time of treatment, the excess connective tissue is removed at a greater rate than normal, while new connective tissue is being formed at the normal rate This raises the question of the mechanism which stops resorption proceeding beyond a certain point One could speculate that the normal equilibrium is regained when the excess tissue has been removed, or that all connective tissue is removed or remodelled while new connective tissue is being formed The first possibility would require that the excess connective tissue should be somehow different from the normal—for instance in its state of polymerisation An alternative explanation of the effect of cortisone would require that it acts by inhibiting cellular activity to the extent of interfering with deposition of formed elements Neither interpretation would of course exclude a direct effect of cortisone on the hepatic parenchyma, as shown, for instance, by the increased amount of glycogen present even after twenty four hours' starvation in cortisone treated rats.

SUMMARY

Carbon tetrachloride causes hepatic fibrosis in rats This change is inhibited if cortisone is given at the same time

I wish to acknowledge the assistance of Dr Isidore Gersh, and the support of the Commonwealth Fund, the American Cancer Society, and the Wallace C and Clara A Abbott Memorial Fund of the University of Chicago

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A WALKING-PLASTER APPLIANCE

D G WRIGHT
M.B Glasg., F.R C S.E
ASSISTANT SURGEON,
ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW

THE appliance shown in figs 1–3 has been used with unvarying success in the past four months It is composed of hard rubber with a core of asbestos The front, sides, and back are vertical and continuous, apart from four slits which pass downwards from the upper edge to terminate an inch from the sole (fig 1) Two of these slits, one on either side of the front, enable the front to be hinged down as a tongue, and the same two slits, in addition to a further slit in each side-wall, allow the sides to be drawn together over the tongue with a leather lace A leather lace is recommended as encountering least frictional resistance from the rubber lace holes which are placed at regular intervals beneath and parallel to the upper edge The sole is rigid and has a flat superior aspect The inferior aspect presents an uneven curve from heel to toe, the apex of the curve lying at the junction of the posterior third and anterior two thirds of the length. The sole is provided with a non skid tread. A range of sizes has been devised to apply to patients of all ages

ORTHOPÆDIC ADVANTAGES

Radiography—There is minimal interference with radiography through the plaster, because there are no side irons or extra plaster for attachment of the appliance and the appliance can be removed with ease

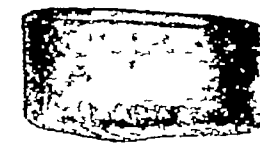
Gait—There is a smooth heel-and toe gait without lurching, bobbing, or rotation of the plastered limb, and there is a reasonable length of pace with either leg (fig 2)

Adaptability—Variation in position of ankle or knee of the plastered limb is readily compensated by placing pads of orthopædic felt inside the footpiece under the forefoot or heel of the plaster A fit has not been effected until the patient can balance with ease on the plastered limb alone (fig 3)

Balance—The appliance allows the patient to walk upstairs or downstairs, and to board or descend from buses with minimal difficulty, and enables a patient with both limbs in plaster to walk with ease

UTILITARIAN ADVANTAGES

Easy Production and Moderate Cost—The shape of the appliance is aimed at allowing easy production by moulding The cost is naturally influenced by the ease of production and by the fact that no additional plaster bandages are required for its application.



Light Weight—The 8 in size, for example, weighs 10 oz

Durability—The composition used is particularly resistant to wear and tear and gives promise of longevity

Protection—The appliance is as watertight as an outdoor shoe and allows the patient to wear a sock or a stocking over the plaster

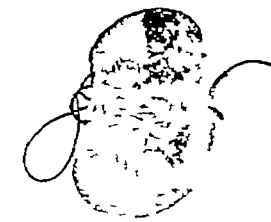


Fig 1—The appliance.

Fit—The yielding nature of the rubber "upper" allows of reasonably accurate fitting of all plastered limbs The sizes vary from 6 in to 12 in. long with a difference of 1 in. between each size, and no variation in width is required for any one length.

Safety—The non skid tread protects the patient from any tendency to slip

Bed Linen—The appliance is removed with the other outdoor garments when the patient goes to bed, and the bed linen is neither soiled nor damaged.

MECHANISM OF THE APPLIANCE

Balance on an immobilised limb alone is most easily achieved when the hip, ankle, and area of contact with

Fig 2—Steady walking in bilateral plasters.

Fig 3—Balancing on one leg

TABLE I—DETAILS OF EXPERIMENTS WITH CARBON TETRACHLORIDE (0 1 ML., SUBCUTANEOUS, TWICE WEEKLY) AND CORTISONE (SUBCUTANEOUS) RATS TREATED WITH CORTISONE WERE KILLED TWO DAYS AFTER THE LAST INJECTION

Group	No of rats	No of CCl_4 injections	Days killed after last CCl_4 injection	Cortisone
1	4	23	2, 5, 9, 13	Nil (control)
2	5	26	3–4	Nil (control)
3	4	33	3–4	Nil (control)
4	4	26	3–4	15 mg /day–4 days 10 mg /day–8 days
5	3	33	3–4	15 mg /day–4 days 3 weeks later 7 mg / day–9 days

the number of rats and their treatment are given in table I Injections with carbon tetrachloride were continued throughout the period of administration of cortisone to avoid complication of the experiment by spontaneous reversion to the normal The dose of cortisone was undoubtedly excessive

All rats were starved for one day before killing, in the hope of freeing the liver of glycogen The rats were killed by bleeding, and small pieces of the liver were fixed by freezing and drying for fine detail, and by immersion into neutral formalin Zenker for general morphology and fibre structure The frozen dried material was embedded in paraffin; sections were cut at 20 μ, and stained by the Hotchkiss method to demonstrate the basement membrane and related substances Material fixed in the customary way was embedded in paraffin and stained with hæmatoxylin and eosin for general survey, and with Mallory azan, and Bielchowsky silver stain, for fibres In contrast with the controls, the liver of cortisone treated rats was found to be rich in glycogen As this is also stained by the Hotchkiss method, it obscures the glycoprotein of the basement membrane To avoid this difficulty it was necessary to treat another series of frozen-dried sections with 95% alcohol overnight, and incubate with saliva for 80 minutes and then stain in the usual manner by the Hotchkiss method

RESULTS

Changes induced in the liver of rats by carbon tetrachloride agree with Cameron and Karunaratne's general findings and in respect of collagen to some extent with Fiessinger's (1945) description They consist of vacuolation (with occasional "ballooning") of the hepatic cells, the presence of mitotic figures, increased cellularity of the stroma ("round" cells, fibroblasts, and pigment laden macrophages), the appearance of coarse collagenous bundles and reticular fibres, and in some cases marked structural alterations of the lobules These effects of carbon tetrachloride varied from rat to rat, as is shown in table II

Of particular interest are the changes which become apparent in livers fixed by the freezing drying method and stained for glycoproteins This method makes it possible to see clearly the basement membrane of the sinusoids, which in the normal fasted animal appears as a delicate, pink staining, finely fibrillar membrane, in places hardly visible, more conspicuous in others The cytoplasm of the hepatic cells contains numerous fine pink granules, arranged presumably in the vicinity of the bile canaliculi Finally this method brings out quite clearly changes in the number, size, and stainability of cytoplasmic granules of sinusoidal cells This brief description is based on the study of the frozen-dried liver of many normal, though younger, animals than the ones used in the present series

TABLE II—THE EXTENT OF THE CHANGE IN COLLAGEN AND RETICULAR FIBRES (FROM "NORMAL" (+) TO "MARKED" (++++)) IN RATS INJECTED WITH CARBON TETRACHLORIDE (CONTROL) AND AFTER TREATMENT WITH CORTISONE

Change in fibres	Collagen		Reticular fibres	
	Number of rats		Number of rats	
	Control	Cortisone	Control	Cortisone
+	2	5	2	4
++	5	0	4	1
+++	5	1	5	1
++++	1	1	2	1

In the majority of the animals treated with carbon tetrachloride the basement membrane seems to be thickened, so that it can now be seen with great ease The number of sinusoidal cells containing granules, and the number of granules in each cell, are both increased In the vicinity of the larger vessels there are many similar, though larger, cells which in addition contain clumps of coarse brown granules A second group of connective tissue cells can be made out, these are long and spindle shaped, with an oval nucleus and granules which appear to be identical with those described in fibroblasts by Gersh and Catchpole (1949) It is of great interest that identical granules were seen in some cells in the sinusoids

The general effects of administration of cortisone confirm those reported in the literature, rapid and progressive loss of weight, marked decrease in the size of the spleen, and a noticeable decrease in that of the adrenal The livers of rats injected with carbon tetrachloride had a slightly irregular margin and their consistency was rubbery The liver margin was smooth and rounded and the parenchyme was soft and readily cut in two of the seven rats given cortisone in addition A third cortisone treated animal had a granulomatous liver resembling that described by Antopol (1950) Microscopically, the most prominent feature of the livers of five of the seven rats given cortisone was that they contained considerably less collagen and reticulin than in the animals given carbon tetrachloride alone In fact, these components were within the normal range (table II) There was also a considerable reduction in the degree of round cell infiltration, and a notable lack of eosinophils. Less constant were the number of mitotic figures and the degree of vacuolation of hepatic cells

Unfortunately, the large amounts of glycogen in the livers of the cortisone treated, fasted animals did not allow a direct comparison of the basement membranes with those of the carbon tetrachloride controls, except in one animal where small groups of glycogen free cells were present The basement membrane in relation to these cells was very thin Removal of the interfering glycogen with saliva leads to swelling and reddening of the basement membrane of the hepatic sinusoids of rats injected with carbon tetrachloride alone Of the seven cortisone treated animals, five showed thinning of the basement membrane, including the one animal which by means of the other stains had shown fibrosis and granulomatous nodules to be present in the liver In a sixth there was a doubtful thickening and the seventh was indistinguishable from the controls Thus we see again the same trend towards the thinning and decrease of the connective tissue elements after cortisone which was brought out by means of the other stains

DISCUSSION

The inhibition by cortisone of the formation of fibrous tissue would be a desirable effect in those diseases where fibrosis plays a prominent part in the causation of the symptoms The experiments just described, although not conclusive, seem to show that such an inhibition and reduction of connective tissue is feasible This applies not only to the reticulin of the liver and the collagen of the portal spaces but also to the basement membranes of the sinusoids Gersh and Catchpole have emphasised in their recent paper the plasticity of connective tissues and described changes which take place in various physiological and pathological conditions These changes were interpreted as an expression of the varying degree of polymerisation of the ground substance which in some cases can be influenced directly by hormonal factors The experiments described here

Duration of Test

The presence and degree of agglutination of sensitised sheep cells by a human serum, absorbed on normal sheep cells, depends to some extent on the time interval between setting up the test and reading the result Table II shows the variations observed in the activity of four absorbed sera when the test was read after an hour at 37°C and again after eighteen hours at 4°C

Although the titre of an absorbed serum is occasionally not affected, there is usually a twofold or fourfold increase in the titre when the test is read after eighteen hours as compared with one hour (serum A) Sera that do not agglutinate sensitised cells after an hour often do not do so after eighteen hours (serum B), but they may cause agglutination in low titre (serum C) or exceptionally in high titre (serum D) In tests of apparently healthy laboratory workers agglutination of sensitised cells was never seen after an hour, whereas agglutination in low titre was sometimes present after eighteen hours Hence reading the test after eighteen hours necessitates the acceptance of an arbitrary titre above which a serum is considered abnormal or "positive" If, however, the test were read after an hour, agglutination of sensitised cells of any degree could be considered abnormal Moreover this method of estimating positivity would greatly facilitate the reading of the test

TABLE I—AGGLUTINATION OF NORMAL AND SENSITISED SHEEP CELLS BEFORE AND AFTER ABSORPTION OF HETEROPHIL ANTIBODY

Serum	Absorption	Sheep cells	Serum dilutions						
			1/4	1/8	1/16	1/32	1/64	1/128	1/256
A	Before	Normal	+	+	+	0	0	0	0
		Sensitised	+	+	+	+	0	0	0
	After	Normal	0	0	0	0	0	0	0
		Sensitised	0	0	0	0	0	0	0
B	Before	Normal	+	+	+	0	0	0	0
		Sensitised	+	+	+	+	+	+	+
	After	Normal	0	0	0	0	0	0	0
		Sensitised	+	+	+	+	+	+	+
C	Before	Normal	+	+	0	0	0	0	0
		Sensitised	+	+	+	+	+	0	0
	After	Normal	0	0	0	0	0	0	0
		Sensitised	+	+	+	+	+	0	0

Serum dilutions were carried to a titre of 1/8192 but no agglutination occurred beyond 1/256

To obtain further data on the influence of time on the result of the test it was decided to take readings after an hour at 37°C and again after eighteen hours at 4°C

Effects of Variations in Hæmolysin

Hæmolysin will agglutinate as well as sensitise sheep cells, but the highest dilution at which agglutination takes place is lower than that at which complete hæmolysis will take place in the presence of excess of complement

In the technique of Rose et al (1948) and Heller et al (1949) twice the minimum hæmolytic dose of hæmolysin was used But it may rarely happen that the agglutinin titre of hæmolysin is as high as the dilution containing two minimum hæmolytic doses, in which case the sensitised cells will be spontaneously agglutinated and the test vitiated Moreover, since the hæmolysin titre was estimated after an hour and the test read after eighteen hours, this rare danger of spontaneous agglutination was increased because during the longer interval the agglutinin titre of hæmolysin was increasing

Different batches of hæmolysin may also affect the sensitivity of the test (table III)

TABLE II—EFFECTS OF TIME ON AGGLUTINATION OF SENSITISED SHEEP CELLS BY ABSORBED HUMAN SERA

Serum	Reading	Serum dilutions					
		1/4	1/8	1/16	1/32	1/64	1/128
A	1 hour	+	+	+	+	0	0
	18 hours	+	+	+	+	+	+
B	1 hour	0	0	0	0	0	0
	18 hours	0	0	0	0	0	0
C	1 hour	0	0	0	0	0	0
	18 hours	+	+	0	0	0	0
D	1 hour	0	0	0	0	0	0
	18 hours	+	+	+	+	0	0

Serum dilutions were carried to 1/8192 but no agglutination occurred beyond 1/128
Similar serum dilutions did not agglutinate normal sheep cells in each of the eight tests

To demonstrate this, a single batch of sheep cells was divided into six lots, each of which was sensitised by a different batch of hæmolysin at a dilution containing one minimum hæmolytic dose Each lot of sensitised cells was then set up against the same absorbed human serum, and the resulting titre read after incubation for an hour at 37°C In hæmolysins A and B the ratio of agglutinin to hæmolysin titre is relatively high, and in both cases the sensitivity of the test, as estimated by the titre of the serum, was slightly increased Hæmolysins C, D, E, and F produced the same degree of sensitivity even though their hæmolysin titres varied from 1/800 to 1/4000, but the ratio of agglutinin to hæmolysin titre was relatively low The difference is slight but indicates nevertheless that the sensitivity of the test cannot be accurately controlled merely by using a constant dose of hæmolysin to sensitise the sheep cells In practice a hæmolysin is chosen with the above facts in mind and then checked for its effect on the sensitivity of the test by using it with a human serum whose agglutinin titre for sensitised cells is known The sensitivity of the test is thus controlled by reference to an arbitrary standard human serum

With a sufficiently wide margin between agglutinin and hæmolysin titres, the sensitivity of the test is not appreciably altered whether one or two hæmolytic doses are used to sensitise the sheep cells With further increases in hæmolytic dose the test becomes gradually more sensitive

TECHNIQUE ADOPTED

From a consideration of these findings the following technique was evolved for demonstrating the activity of human sera towards sensitised cells

Preparation of Reagents

Commercial defibrinated sheep blood, four days old, is washed three times in physiological saline solution. The packed-cell volume is determined and a 2% suspension prepared 0 85% saline solution is used as the diluent for all reagents

TABLE III—EFFECTS OF DIFFERENT HÆMOLYSINS ON SENSITIVITY OF TEST

Hæmolysin	Hæmolysin titre (HT)	Agglutinin titre (AT)	AT/HT	Titre of test serum for sensitised cells
A	1/2000	1/600	0 30	128
B	1/200	1/50	0 25	128
C	1/4000	1/400	0 10	64
D	1/1800	1/100	0 05	64
E	1/800	1/50	0 06	64
F	1/1400	1/200	0 14	64

Rabbit anti sheep erythrocyte serum (hæmolysin) is prepared by any of the standard techniques (Medical Research Council 1918) It is stable for months if stored frozen. Preserved hæmolysin has not been satisfactory The titre of the hæmolysin is determined as follows 0 25 ml of

the ground are in the same vertical line The area of contact when the appliance is fitted is the apex of the sole curve, slightly compressed by the patient's weight The site of this apex on the sole ensures that, when the upper surface of the sole is horizontal, a part at least of the small weight bearing area lies vertically under the ankle joint in the great majority of cases, and to effect the necessary balance requires only minor adjustment, if any, to bring the hip into the same vertical line This is achieved automatically in a below-knee plaster in which the ankle joint is approximately at 90°, or in an above knee plaster in which the surgeon has produced a degree of dorsiflexion at the ankle to counteract the degree of flexion at the knee In these cases the appliance is fitted and the patient can immediately balance on the plastered limb alone If a "hard soled" plaster is desired the patient is instructed to refrain for twenty four hours from weight bearing

If, either by accident or design, the angle of the ankle (short plaster with considerably plantar-flexed ankle) or of the ankle and knee combined (long plaster) causes the hip to lie behind the vertical line passing through the apex, the patient, when standing on the plastered limb alone, will tend to roll backward Adhesive orthopædic felt is then placed inside the heel of the appliance until the heel of the plaster is raised sufficiently to rotate the hip forward into the desired plane Conversely, if the hip lies anterior to the desired line (short or long plaster with considerably dorsiflexed ankle), adhesive felt is placed in the forefoot of the appliance until the plastered forefoot has been elevated sufficiently to rotate the hip back into line Easy balance has thus been achieved in either case without any alteration of the plaster

The thickness of the sole at the apex is such as to ensure reasonable equality in length of the plastered limb with that of the sound limb if normal footwear is worn But adjustment for a high heeled shoe on the sound limb or for relative shortening of the plastered limb requires only the insertion of pads of felt inside the entire length of the sole to raise the plastered foot to the requisite distance from the ground

The balance, equality in length of limbs, and the fact that the apex of the curve is only from $^1/_4$ in (in the 6 in size) to $^1/_2$ in (in the 12 in size) produce an even heel and toe gait without lurching, "corkscrewing," or bobbing up and down, while at the same time the patient has a reasonable length of pace with either limb

I wish to thank my chief, Mr Matthew White, on whose patients the appliance was elaborated, the makers, Messrs George McLellan & Co, Glasgow Rubber & Asbestos Works, Maryhill, Glasgow, and particularly Mr Dee and Mr Armour of that firm, and Mr Evatt and Mrs Stewart of the Royal Hospital for Sick Children photographic department Photographs were taken with a 200 joule electronic flash lamp producing a flash of $^1/_{2000}$ second duration. The method of taking was to walk the child up and down a pre determined line on the studio floor on which the camera had previously been focused, and to trip the flash (and expose the plate) when he arrived at a point opposite the lens axis Owing to the great intensity of light and extreme short dura tion of exposure it was thus possible to obtain a perfectly natural unposed walking photograph indoors

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" the hospital allowed Oliver to come home When he turned to Julia he said 'I was afraid all the time of what they would do to me next, but I got out before they could do the worst thing of all I kept hearing them say I would have to have my bowels opened'—'Oh, the terrors children suffer needlessly Julia cried 'It only means Syrup of Figs or something of that kind'—'I wish I had

ELIZABETH TAYLOR At Mrs

SERUM FACTOR IN RHEUMATOID ARTHRITIS AGGLUTINATING SENSITISED SHEEP RED CELLS

J BALL
M.B, B Sc Manc
RESEARCH ASSISTANT IN THE DEPARTMENT OF RHEUMATISM RESEARCH, UNIVERSITY OF MANCHESTER

Rose et al (1948) accidentally found in a case of rheumatoid arthritis that the patient's serum agglutinated sensitised sheep erythrocytes in high dilution, whereas normal sheep cells were agglutinated only in low dilution They subsequently devised a technique for determining the agglutinin titre of human serum for normal and sensitised sheep cells Their method was essentially as follows

A 1% suspension of sensitised sheep cells was prepared by adding to a volume of a 2% suspension of washed normal (non sensitised) sheep cells an equal volume of a rabbit anti sheep erythrocyte serum (hæmolysin) containing two minimum hæmolytic doses The serum under test was inactivated at 56°C, and two series of doubling dilutions in 0 5 ml volumes were made An equal volume of a 1% suspension of sensitised sheep cells was added to one series, and an equal volume of a 1% suspension of normal sheep cells to the other The results were read after incubation at 37°C for an hour and refrigeration at 4°C overnight When the agglutinin titre for sensitised cells was sixteen times or more the agglutinin titre for normal cells the test was considered positive

After examining sera from 110 patients, including 51 cases of rheumatoid arthritis, Rose et al suggested that the test might be a useful diagnostic aid in this condition This opinion was generally confirmed by Sulkin et al (1949) and Jawetz and Hook (1949), both using the above technique in 148 and 160 cases respectively

FACTORS AFFECTING AGGLUTINATION

A critical examination of this technique shows that three important points had not been considered in devising the test (1) the rôle of heterophil antibody, (2) the duration of the test, and (3) the effects of variations in hæmolysin

Rôle of Heterophil Antibody

The agglutination of sensitised cells may be due to two distinct factors, one of which, heterophil antibody, can be absorbed on normal sheep or ox erythrocytes, whereas the other cannot Table I shows the results obtained in testing different human sera on normal and sensitised sheep erythrocytes before and after absorption on normal sheep cells

Absorption of serum A leads to complete loss of agglutinating activity for both normal and sensitised sheep erythrocytes Serum B similarly treated shows complete loss of agglutinating activity for normal sheep cells, but its activity for sensitised sheep cells is unaffected Serum C behaves like serum B, though its titre for sensitised cells is lower In the case of serum B and C, absorption on normal ox cells or repeated absorption on normal sheep cells does not affect the agglutinin titre of the serum for sensitised sheep cells Since heterophil antibody is not increased in rheumatoid arthritis, these results indicate that the high agglutinin titre for sensitised cells observed by Rose et al (1948) in some of these cases was due essentially to this new serum factor Moreover it seemed likely that if rheuma toid arthritis had any specific activity for sensitised sheep cells it would be concerned with this serum factor, and therefore the presence of heterophil antibody in the serum under test would be both unnecessary and

rheumatism Some of the cases were repeatedly tested at intervals, but a positive result was never obtained

Group 7 consisted of 134 cases of non arthritic disease (table VI) All gave a negative reaction

Group 8 consisted of 67 miscellaneous medical and surgical patients, all but 1 of whom gave a negative reaction.

To compare the above findings with the results obtained when the test was read after eighteen hours, an arbitrary titre of 1/32 or more at this time was taken as indicating a positive result It was then possible to show that the number of cases of rheumatoid arthritis giving a positive result after eighteen hours was 159 (55 6%) as compared with 140 (49%) with the one hour reading But the number of false positive cases was increased from 12 (1 9%) to 27 (4 4%) Since a gain in specificity is relatively more important for diagnostic purposes than is a small increase in sensitivity, reading the test after an hour was considered the method of choice Moreover the reading of the results is greatly facilitated by the one hour method which does not involve the estimation of an end point of agglutination, this criticism is applicable to the technique devised by Heller et al (1949), in which a positive result depended on agglutination in a titre of 1/28 or higher with complete agglutination in dilutions of 1/7 and 1/14

It was observed in serial tests that, when occasionally a positive case of rheumatoid arthritis became negative, it passed through a phase in which a negative result was obtained after an hour but agglutination in a titre of 1/32 or more was present after eighteen hours Hence the observation of a delayed reaction of this type is useful in that it indicates the necessity of repeating the test It should then be emphasised that, though it is necessary and convenient to base positivity on the results of the test as read after an hour, additional information can be obtained by reading again after eighteen hours, and this should therefore be included as part of the technique

TABLE VI—CLINICAL SUBDIVISION OF 134 CASES OF NON ARTHRITIC DISEASE

Disease	No
Cardiovascular disease	33
Bacterial infections	19
Diseases of the nervous system	19
Tumours (mostly malignant)	13
Endocrine disorders	12
Acute nephritis (Ellis type I)	4
Pernicious anæmia	3
Paget s disease	2
Nephritis (Ellis type II)	2
Peptic ulcer	2
Hepatitis (amœbic)	2
Hepatitis (virus)	1
Cirrhosis	1
Obstructive jaundice	1
Ulcerative colitis	1
Multiple myelomata	1
Scleroderma	1
Sarcoidosis	1
Chronic nephritis (Ellis type I)	1
Miscellaneous	15

DISCUSSION

The factor in human sera which agglutinates sensitised sheep erythrocytes and is distinct from heterophil antibody is of considerable serological interest It seems to be present in relatively small amounts in the sera of some apparently healthy persons as well as in various diseases, but in some cases of rheumatoid arthritis its concentration is greatly increased, with the result that agglutination of sensitised cells may be evident when the serum is diluted a thousand times or more Since this work was completed, the papers of Jawetz and Hook (1949) and Heller et al (1949) have come to hand In examining the sera of 160 patients Jawetz and Hook followed in detail the technique devised by Rose et al (1948), and in a discussion of the test they mentioned that sensitised sheep cells were agglutinated by some human sera even after exposure of the sera to ox cells or guineapig kidney, both of which absorb heterophil antibody Heller et al. showed that, with some human sera, preliminary absorption with normal sheep erythrocytes did not affect the power to agglutinate sensitised sheep cells Including my own, there are thus three independent demonstrations that the serum factor for sensitised sheep cells is not identical with heterophil antibody

This serum factor may be of importance in the study of agglutination phenomena, and it may possibly be related to the disease process of rheumatoid arthritis At present, however, its precise nature is unknown Believing it to be an antibody, Heller et al used the term hæmagglutinin, but no substantial evidence identifying it as such has yet appeared Indeed, in preliminary experiments I have found that repeated absorption of a positive serum with sensitised sheep cells leads to a delayed reaction with only slight loss of agglutinating activity—a finding which would not be expected of an antibody

The results of the clinical trial strongly suggest that the test offers the advantage of considerable specificity, 91 5% of the positive results having been clinically diagnosed as rheumatoid arthritis Further, 5 of the 13 false positive results occurred in patients with arthritic disease which might easily have been labelled rheumatoid arthritis The results published by Heller et al on 157 cases generally agree with my findings A much larger arthritic and non arthritic control group will have to be studied before the test can be finally assessed

The high incidence of negative results in ankylosing spondylitis (97 6%) and osteo arthritis (98 1%) contrasts strikingly with the findings in rheumatoid arthritis The significance of the negative results in many cases considered to be rheumatoid arthritis on clinical grounds is not clear It has been suggested that the test is seriously limited as a diagnostic aid because positive results are obtained only in highly active cases of rheumatoid arthritis, or only when the characteristic X ray changes are present (Heller et al 1949) Although a detailed clinical follow-up of the positive and negative cases of rheumatoid arthritis has not yet been made, I have occasionally observed positive results in apparently classical cases of rheumatoid arthritis at a stage when X rays showed no definite abnormality Again, not a few cases of rheumatoid arthritis with a clinical history of six months or less have also been positive On the other hand, it is generally agreed that rheumatoid arthritis is an ill defined clinical syndrome which merges with various arthritic, peripheral vascular, and other diseases, and any test which facilitated the delineation of a single clinical group might be of value in the study of rheumatic disease.

SUMMARY

The test for rheumatoid arthritis devised by Rose et al has been critically examined, and it has been shown that the agglutination of sensitised sheep cells by some human sera is due to a factor distinct from heterophil antibody

From a consideration of this and other factors involved in the reaction a new technique has been developed

Of the 895 cases tested by this technique 153 gave a positive result, and of these 140 (91 5%) were diagnosed clinically as rheumatoid arthritis, this disease comprising 32% of the total number of cases

In 97 6% of 85 cases of ankylosing spondylitis, 98 1% of 107 cases of osteo arthritis, 94 2% of 120 cases of other forms of arthritis, and in 100% of 134 cases of non arthritic disease the test gave a negative result

My thanks are due to Prof S L Baker and Dr J H Kellgren for their constant interest and advice

various dilutions of hæmolysin is added to a series of tubes, each containing 0 25 ml of a 2% suspension of normal sheep cells The mixture is allowed to stand for an hour to ensure sensitisation of the sheep cells, and then to each tube are added 0 25 ml of 0 85% saline solution and 0 25 ml of a 1/10 dilution of complement The tubes are next placed in a water bath at 37°C for an hour The highest dilution showing complete hæmolysis represents one hæmolytic dose The titre of hæmolysin has varied from 1/600 to 1/4000 The agglutinin titre of the hæmolysin is determined at the same time as follows 0 25 ml of various dilutions of hæmolysin is placed in a series of tubes, each containing 0 25 ml of a 2% suspension of sheep cells and 0 5 ml of saline solution. The tubes used for this estimation have the same internal diameter as those used for the test proper After incubation at 37°C for an hour the titre is read with the naked eye and corresponds to the highest dilution showing agglutination The agglutinin titre of hæmolysin used has never exceeded 1/100 To ensure that a given hæmolysin is suitable, it is used in a preliminary test of a standard human serum of known agglutinin titre for sensitised cells

A 1% suspension of sensitised sheep cells is prepared by thoroughly mixing a volume of hæmolysin, containing one minimum hæmolytic dose, with an equal volume of a 2% suspension of normal sheep cells The resulting suspension is allowed to stand for an hour at room temperature before being used in the test

A 1% suspension of normal sheep cells is prepared from the same 2% suspension used for the preparation of the sensitised cells

The test serum (derived from clotted blood) is inactivated at 57–58°C for 20 min It is stable at least for some months when preserved frozen and for ordinary purposes may be stored at 4°C A little over 1 ml of the serum is added to a centrifuge tube containing 0 5–0 75 ml of packed normal sheep cells The tube is shaken, and the mixture is incubated in a water bath at 37°C for an hour The cells are then spun down, and the serum is removed This absorbed serum is now ready for the test proper

The Test

Two rows of tubes (internal diameter 0 8 cm) are set up in a Kahn rack The back row consists of twelve tubes, the front row of four Doubling dilutions of the absorbed serum in 0 5 ml volumes are made so that the back row of tubes contains serum dilutions ranging from 1/2 to 1/4096 and the front row contains dilutions ranging from 1/2 to 1/16 Two additional tubes, each containing 0 5 ml of saline solution instead of serum dilution, are placed in the rack 0 5 ml of the 1% suspension of sensitised sheep cells is added to each of the twelve tubes in the back row and to one of the two tubes containing saline solution instead of serum (sensitised cell control) 0 5 ml of the 1% suspension of normal sheep cells is added to each of the four tubes in the front row and to the remaining tube containing saline instead of serum dilution (normal cell control) The final dilutions of the serum under test thus range from 1/4 to 1/8192

After each tube has been shaken the rack is placed in a water bath at 37°C for an hour It is then removed, and each tube is gently inverted three times to resuspend the cells The results are then read with the naked eye The sensitised cell control, the normal cell control, and the four tubes containing normal cells should show no trace of agglutination Agglutination of sensitised cells in a dilution of 1/4 (first tube) or higher constitutes a positive result. A serum whose titre for sensitised cells is known is included in each batch of cases

RESULTS

Since April, 1949, this technique has been used in a clinical trial involving over 1000 cases The sera were examined in weekly batches of up to 46 and so arranged that it was impossible for the person reading the results to know the origin of the serum under test As previously mentioned, each test was also read after eighteen hours at 4°C, but, for reasons discussed below, the findings in the clinical trial were based only on the results obtained when the test was read after an hour at 37°C, as described above Clinical material was obtained largely from three sources

1 Every new patient attending the outpatient department of the Manchester Rheumatism Centre was tested

TABLE IV—ANALYSIS OF RESULTS IN 895 CASES OF ARTHRITIC AND NON ARTHRITIC DISEASE

Group	Disease	Total	Positive		Negative	
			No		No	
1	Rheumatoid arthritis	286	140	(49 0%)	146	(51 0%)
2	Ankylosing spondylitis	85	2	(2 4%)	83	(97 6%)
3	Osteo-arthritis	107	2	(1 9%)	105	(98 1%)
4	Other arthritides (table v)	120	7	(5 8%)	113	(94 2%)
5	Indeterminate painful states	79	1	(1 3%)	78	(98 7%)
6	Rheumatic fever and acute and subacute rheumatism	17	0		17	(100 0%)
7	Non arthritic diseases (table vi)	134	0		134	(100 0%)
8	Miscellaneous sera—clinical diagnosis untraced	67	1	(1 5%)	66	(98 5%)

2 Samples of sera sent for the Wassermann reaction provided the bulk of the non arthritic controls

3 A relatively few sera were obtained from selected inpatients of the Manchester Royal Infirmary

A preliminary analysis of the results in 895 cases has been made Of the total number 153 gave a positive reaction Cases diagnosed clinically as rheumatoid arthritis comprised 32% of the total and 91 5% of the positive reactions The 895 cases have been further divided into eight clinical groups (table IV)

Group 1 consisted of 286 cases diagnosed clinically as rheumatoid arthritis Of these, 140 (49%) were positive and 146 (51%) negative The group as a whole undoubtedly contained cases in which the disease had been inactive for years On the other hand, there were early cases with a history of six months or less, some of which were positive A detailed clinical analysis of the negative and positive cases of rheumatoid arthritis has not yet been made A few of both negative and positive cases were repeatedly tested over periods of up to six months With a few exceptions the positive cases remained positive and the negative cases remained negative

Group 2 consisted of 85 cases of ankylosing spondylitis, 83 (97 6%) were negative and 2 (3 4%) were positive

Group 3 consisted of 107 cases of osteo arthritis, 105 (98 3%) were negative and 2 (1 7%) were positive

Group 4 consisted of 120 arthritic cases other than rheumatoid arthritis and ankylosing spondylitis (table v), 113 (94 2%) were negative and 7 (5 8%) positive Although the number of cases in individual subgroups is too small for any final conclusions, it is worth noting that the results in disseminated lupus erythematosus contrast strongly with the rest

Group 5 consisted of 79 patients who had attended the rheumatism clinic and been diagnosed as suffering from indeterminate painful states, to which labels such as fibrositis, neuritis, and psychogenic rheumatism are usually attached All but 1 gave a negative reaction

Group 6 consisted of 9 cases of acute rheumatic fever at various stages and 8 cases diagnosed as acute or subacute

TABLE V—ANALYSIS OF 120 CASES OF ARTHRITIC DISEASE

Disease	Total	Positive	Negative
Arthritis type undetermined	32	1	31
Lesion of intervertebral disc	25	1	24
Infective arthritis	10	0	10
Gout	5	0	5
Atypical polyarthritis	5	1	4
Reiter s syndrome	4	0	4
Intermittent hydrarthrosis	4	0	4
Disseminated lupus erythematosus	4	3	1
Dermatomyositis	2	1	1
Tuberculous arthritis	2	0	2
Gonococcal arthritis	2	0	2
Hypertrophic pulmonary osteo arthropathy	2	0	2
Hæmarthrosis	1	0	1
Periarteritis nodosa	1	0	1
Charcot s osteo arthropathy	1	0	1
Miscellaneous	20	0	20
Total	120	7	113

Reviews of Books

Techniques in British Surgery

Editor RODNEY MAINGOT, F R.C S London W B Saunders 1950 Pp 733 75s

Mr Maingot has collected together accounts of new—or in some cases specially difficult—operations by acknowledged authorities, of whom there are 28 besides himself Every one of them is an expert, and the subjects dealt with are often of that troublesome kind, such as stress incontinence in the female, in which the experience of the general surgeon is not usually great. New operations which may be regarded as still on trial, such as thymectomy, and operations which are not uniformly successful, such as repair of hernia, are also included The choice of subjects is catholic, and the presentation masterly We know of no better description of Heller's operation for cardiospasm than that contributed by Maingot himself, and a high standard is throughout attained The illustrations are very fine and the book will be used widely for reference We hope the editor will fulfil his promise to add several sections in the future

The Biochemistry of the Nucleic Acids

J N DAVIDSON, M.D, D SC, Gardiner professor of physiological chemistry, University of Glasgow London Methuen. 1950 Pp 163 7s 6d

THE use of the word "elementary" can be overdone, and this small monograph on the nucleic acids is not so elementary as the author suggests in his preface It deals, in fact, with some of the most complicated problems in modern biochemistry, but it is written in such clear and simple language that it is a pleasure for even the non-specialised to read it

From sound structural organic chemistry Professor Davidson gradually builds up the formulæ of the nucleotides and nucleosides. Then he deals with the nucleases and ultraviolet absorption of the purine and pyrimidine rings The application of this curious physical fact to the study of nucleic acid metabolism is a good example of modern technical application and achievement An account follows of the chemical methods of estimating the two nucleic acids found in cells, and their distribution between the nucleus and the cytoplasm, for it is certain now that ribose nucleic acid (R N A to modern biochemists, and plant nucleic acid to their predecessors) is abundantly present in the cytoplasm of mammalian cells, especially in those which are actively synthesising protein The remainder of the book is devoted to the metabolism, synthesis, and biological function of the nucleic acids

The whole book is up to date, and these last chapters even contain an account of most of the recent work with isotopes and labelled elements The final chapter on the bacterial and viral nucleoproteins is one of the most stimulating of all There are four pages of photographs, plenty of diagrams and graphs and ample references It is cheering to see the truly international character of the research work on this subject

Freud or Jung

EDWARD GLOVER, M.D Glasg London Allen & Unwin. 1950 Pp 207 15s

Dr Glover, who is perhaps our most militant Freudian, subjects Jung's writings to merciless and mordant criticism. He points out that there are three ways in which attempts may be made to negate Freud's theory of unconscious mental functioning first, to operate in terms of conscious psychology, secondly (the ways of Rank Klein, and Adler) to exaggerate postnatal and constitutional influences, and thirdly, to abandon psychology altogether Dr Glover surmises that Jung is nothing more nor less than a pre-Freudian who, having let himself be carried in the stream of Freudian thought has ever since struggled to make his peace with conscious psychology Even Jung s character-types, which have received wide recognition, are gleefully knocked down by Dr Glover such descriptive labels as introversion and extraversion give no hint, he finds, of the complex dynamic and structural developments that lead to the formation of character He demolishes Jungian psychology so easily that one wonders if his main adversary is not another—the fellow-traveller or eclectic psychiatrist, whom he scolds for his shameful concern with therapeutic results and his neglect of creed and principles The eclectic, he insists, must either accept the fundamental Freudian concepts of the unconscious mind or else cling to pre-Freudian views based on the conviction that mind and consciousness are synonymous But when he claims that anyone who accepts the unconscious mind, infantile sexuality, repression, conflict, and transference, is accepting all psychoanalytical teaching Dr Glover goes too far Many who accept these phenomena are unable to digest a theory that recognises psychogenic causes only, and minimises the effects of organic and constitutional factors

This zestfully written book with its robust and reasoned arguments strikes a blow at *Analytical Psychology* that might well be mortal, were it not that Jung is still very much alive and likely to make his answer

Hysterography in Cancer of the Corpus of the Uterus

OLAF NORMAN, from the röntgen diagnostic department, University Clinics of Lund Lund Berlingska Boktryckeriet 1950 Pp 156

THE title of this work immediately suggests the question 'What is the matter with the method of diagnosis of cancer of the corpus of the uterus by means of the curette ?" Dr Norman answers it by describing several cases in which the tissue obtained by curettage failed to reveal the presence of a malignant growth, which hysterography showed to be present He writes clearly, in perfect English and the book is profusely illustrated by reproductions of X ray pictures Gynæcologists and radiologists not familiar with this method of diagnosis will profit by studying his technique and results

Human Personality and Minor Disorders

WILLIAM HARROWES, M D, M.R C.P.E, D.P M., F.R S.E Edinburgh E & S Livingstone 1949 Pp 260 15s

ALTHOUGH the late Adolf Meyer never wrote a book to embody his teachings, his pupils have repaired the omission Of these none is more faithful than Dr Harrowes—not only to the broad principles which Professor Meyer taught, but also to his plan of exposition The personality study which at Johns Hopkins served the purpose of self-knowledge and psychological understanding, for which a psycho-analysis is nowadays sometimes deemed necessary, is here made the basis of a general discourse on the structure of personality and its relation to experience and social demands Determined to avoid dogmatism sciolism dualism, excessive hypostatisation, and various other failings to which dynamic psychology is prone the author gives the impression of being thoroughly sensible rather than penetrating safe and wise but not particularly illuminating, if his oracle is not sibylline or deceitful, neither is it far removed from what ordinary men say when called into counsel Invaluable as Adolf Meyer's psycho biology has been and still is to psychiatrists, its expositors should now take account of the detailed findings and rich material accumulated by other psychologists and psychiatrists since Dr Meyer formulated his working philosophy Norman Cameron s book was a happy example of such a restatement Dr Harrowes has been too loyal in his strict adherence to the incomparably sane and balanced teaching which in its day and for more than two decades made the Henry Phipps Clinic a nursery of psychiatrists as averse from excursions into theory as from inertia in the study and treatment of their patients

L'Arachnoidite optique canaliculaire et orbitaire

RENE CAZABAN, assistant ophthalmologist, Montpellier Hospitals Paris L Expansion Scientifique Française 1950 Pp 102

THE concept of optochiasmic arachnoiditis, evolved during the past twenty years, has suggested a surgical approach to the complex problem of optic atrophy Unfortunately, however, operative removal of adhesions around the chiasma and the intracranial portions of the optic nerve has given disappointing results Moreover the frequency of such adhesions appears to have been overrated Dr Cazaban seeks to extend the original concept by emphasising that the optic nerve has a

POSTSCRIPT

Since writing this paper, I have found that the non identity of the serum factor and heterophil antibody was also recognised by Waaler (1940) whose paper seems to have been generally overlooked

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Medical Societies

LIVERPOOL MEDICAL INSTITUTION

Medical Services for Students

AT a meeting on Oct 19, with Dr DAVID JOHNSTON, the president, in the chair, Dr R W PARNELL pointed out that the student health movement was world-wide, outside Britain and America there were known to be 58 university health services in twenty-five different countries In 50 of these services routine chest radiography was practised, while in over two-thirds of the total a general physical examination was made In the U S A the Student Health Association, with two hundred member institutions, had met annually for over twenty-five years In Great Britain only 4 of the 17 universities now had no whole time student health officer

Industrial health services existed because of the advantages in providing for a group with common needs, and it would be unfair to suggest that there was no industry among 130,000 students in Great Britain Health examinations were valuable in at least two ways (1) they were preventive, leading, for example, to early diagnosis of tuberculosis and to better planning of study schedules and less mental strain at the time of examinations, (2) health records relating to one group with one set of occupational risks were essential to research on normal health The importance of tuberculosis was recognised by everyone interested in the care of young adults It was not generally recognised, however, that nervous breakdown caused far more prolonged illness in students than did tuberculosis High recovery-rates suggested that here lay great, though often neglected, opportunity for preventive action following earlier diagnosis

Dr V COTTON CORNWALL said that in a medical service for students the prevention and treatment of tuberculosis had a very important place Dr Nicholas Malleson's figures showed that about 0 2% of non-medical students, and about 1 0% of medical students, were victims of this disease Even if they recovered, the loss of academic time was serious The idea of a post-cure rehabilitation centre of, say, 100 beds for the country was excellent, but time and money would be needed If, however, the regional boards and the universities would coöperate something could be done at once All affected students should be sent for treatment to one particular hospital in each region, and the faculties to which these students belonged should guide their studies within limits set by the physician in charge In the Liverpool region not more than 12 beds would be needed No extra money was necessary—only good will and coöperation

Dr R W BROOKFIELD remarked that medical care was only one aspect of the much larger subject of student welfare Catering arrangements, means of transport, and supervision of lodgings were important for the well-being of the student and should be the responsibility of laymen working in conjunction with the medical officer In those universities where students were supervised by a tutor, the tutor could contribute greatly to the physical and mental health of those in his care by drawing the doctor's attention to suspected abnormalities

Dr G W TAYLOR suggested that the high incidence of anxiety state and other mental illnesses among university students might be reduced by means of the tutorial system as operated in Scottish universities The regent was in a position to understand mild anxiety states in the student and to give early help, thus forestalling the disability which might ensue from the undetected "pre-examination syndrome"

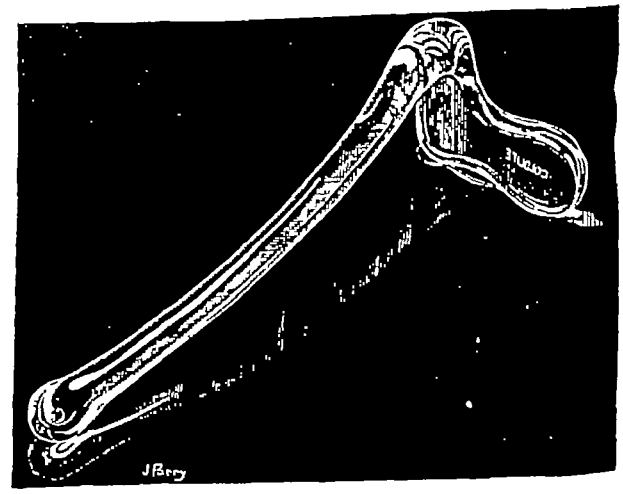
New Inventions

TUBAL PALPATOR FOR SALPINGOGRAPHY

THE increasing use of salpingography has led workers to experiment with solutions more rapidly eliminated than the older oil media The introduction of such water-soluble media in the last few years has been highly successful from that point of view, but the very rapidity of elimination has brought with it some special difficulties

Where there is considerable spasm of the fallopian tubes it is sometimes difficult, during the screen examination, to determine whether a tube is patent or not, especially if there is a dilated and tortuous tube With oil media, the presence of the oil 24 hours later, distributed among the intestines, can be taken as positive proof of patency This is not possible with the newer media, which are sometimes so rapidly absorbed that most of the medium is eliminated within 20 minutes If one could delay absorption to a few hours one might, in a doubtful case, be able to see the medium dispersed in the abdomen later, but unfortunately the makers state that it is not possible so to delay the absorption of water soluble media

On the basis of an idea put forward by Marsalek,[1] who used a wooden stick in the rectum, I have devised the plastic instrument illustrated here, which can be inserted into the rectum and carries a radiopaque marker at the tip The instrument may be inserted into the rectum either before or during the injection of the medium Where there is doubt about tubal patency, the tube on the left side, and quite often that on the right also, may then be manipulated and squeezed



between the pelvic wall and the instrument, when extrusion of the fluid will establish that the tube is patent. Thus the difficulties arising from rapidly absorbed media can often be overcome

The instrument is also extremely useful in malpositions to determine fixity of the uterus or adhesions of the tubes It can also be used to replace a retroverted uterus under the X-ray screen, to show whether reposition improves patency

The instrument is made by Messrs Vann Bros Ltd., 63, Weymouth Street, London, W 1, to whom I am indebted for their coöperation My thanks are also due to Miss J Perry, official artist to the Manchester Regional Hospital Board, for the drawing

BERNARD SANDLER
M D Manc, D.M.R. D OBST
Medical Officer to the Subfertility Clinic,
Manchester Victoria Memorial Jewish Hospital.

1 Marsalek J *Gynaecologia Basle* 1948 126 1

THE LANCET

LONDON SATURDAY, NOV 11, 1950

Revolt at Kingston

ONE of the main advantages expected from the National Health Service was that the hospital services of each region would be rationally planned To fulfil its duties, each board needs not only the courage of its convictions but also power to do, within limits, whatever it thinks necessary If boards are to take wide rather than narrow views of hospital arrangement, they should have some protection from continual pressure either from below or from above, and at present they enjoy such protection because they are not elected bodies and because the Minister, though he often offers them advice, very seldom gives them instructions The boards are thus in a position to exercise detached judgment, as was intended But this detachment unfortunately carries its own risks Freed from the need to follow public opinion, the boards may pay too little attention to it And the more they are intent on the good of the hospitals the less they may study the good of the National Health Service as a whole, and of its other branches These tendencies have been evident in the controversies that have arisen over the proposed extinction of small long established hospitals, such as the London Lock Hospital and Paddington Green Children's Hospital, which were convenient to the people of their neighbourhood, and over the conversion of existing general-practitioner hospitals to other purposes, as at Morecambe, Felixstowe, and now Kingston upon Thames If it were certain that the principles governing these changes were correct, we should all feel obliged to support them, despite the inconvenience caused to individuals But in preferring large hospitals to small ones boards are applying a policy which many believe to be already outmoded, and where they deprive general practitioners of hospital beds, without adequate clinical compensation, they are acting on the ideas of five years ago rather than those of today

The disagreement over the future of the Kingston and Malden Victoria Hospital springs from the South West Metropolitan Regional Hospital Board's decision to turn this well equipped general practitioner hospital into a gynæcological unit, thus freeing beds at the nearby general hospital for maternity cases and enabling it to give distinctly better service Three times the management committee disputed this decision, but last summer it lost its chairman and three members who were prominent in their opposition when their term of office ended the board took the opportunity of not reappointing them, and the committee as reconstituted now supports the board The Ministry of Health has been unwilling to interfere with the board's choice of members for the committee,[1] or with its decision on the hospital's future use [2] The general practitioner staff last month received twelve days' notice to quit the hospital. This they have not accepted, on the ground that the alternative offered—a building without lifts, operating-theatre, or adequate nurses' accommodation—is unsuitable Nor do these practitioners regard the offer of clinical assistantships at the general hospital as sufficient recompense

This conflict exposes more than one of the potential weak spots in the service In the first place, hospital boards, being concerned with the efficiency of their own services rather than the future of general practice, are liable, despite the Minister's advice,[3] to ignore the effect of their decisions on the prestige and quality of the family doctor's work (It seems extraordinary that at Kingston, according to spokesmen of the "Kingston Victoria Defence Committee," the Surrey Executive Council has succeeded no better than other bodies in making its objections heard) Secondly, a board which, seeing its resources as a whole, knows that it must be the final arbiter, may be inclined not to bother to carry public opinion with it At Kingston and Malden, where the town councils have protested and a vigorously hostile poster campaign has been started, the South West Metropolitan Board does not seem to have taken enough pains to allay local opposition Had there been a full and public inquiry at which all responsible parties were invited to express their views, the board's decision might still have seemed unreasonable to some, but no charge of cabalism could have been sustained Medicine, even in hospitals, is a personal affair in which the emotions are closely engaged, and by failing to consult and convert local sentiment a board or committee may unwittingly stop people from thinking of hospitals as existing for them and belonging to them

Early Smallpox

SINCE compulsion was withdrawn two years ago much fewer babies have been vaccinated, and the more people susceptible to smallpox there are in our population the more important it will become to recognise imported infection as early as possible Typical cases seldom present much difficulty to the experienced clinician, but atypical cases are not rare, and this year's Glasgow outbreak illustrated how dangerous they can be The clinician should always have his suspicions confirmed or allayed without delay by the laboratory, where the methods of diagnosing smallpox are now rapid and thoroughly reliable What tests to apply at different stages of the infection, and the material required for them, were discussed by DOWNIE [4] four years ago When the first focal lesions appear, the maculopapules should be scraped with a scalpel or needle and the exudate smeared (but not fixed) on clean glass slides, the laboratory can use smears of this kind for microscopical examination, for culture on the chorio allantois of the developing chick, or as an antigen for complement-fixation tests The smears may contain living virus, so they must be handled and packed with special care The serological complement-fixation test for specific antigen, when done on adequate samples of scrapings from papules, on fluid from vesicles and pustules, or on crusts of dry lesions, is

1 See *Lancet* 1950 i 637
2 *Ibid* July 1 1950 p 31
3 R.H B (49) 132 See *Lancet* 1949, ii 703 711
4 Downie A W *Mon Bull Min Hlth* 1946 5, 114

course in the optic canal and in the orbit, and that in this course it is surrounded not only by pia mater but by all the layers of the meninges Meningitis at the canal and in the orbit would therefore seem possible as a pathological entity, and he advances evidence of its existence obtained mainly by operative exposure of the optic nerve As ætiological factors, he incriminates neighbourhood infection—e g , of the sinuses—and general disturbances, in which the common causes of acute and chronic meningitis figure His view that Leber's disease is secondary to this type of meningitis is hardly convincing

Clinical Nutrition

Editors NORMAN JOLLIFFE, FREDERICK F TISDALL, PAUL R CANNON, for the Food and Nutrition Board of the National Research Council, United States of America London Cassell 1950 Pp 925 90s

THE 31 chapters of this book have been contributed singly or jointly by 36 authors, most of them well known and all of them experienced

In the opening section on diagnosis the chapter on the clinical signs stands out by reason of the clearness of the text, the coloured illustrations, and the photographs A detailed analysis follows of the various deficiencies that may lead to malnutrition—protein, carbohydrate, calories, and the various minerals and vitamins being discussed in turn The vitamins are not given undue prominence, and the chapter on sodium and potassium is one of the best The remainder of the book deals with therapy and prevention, and contains some valuable articles Newburgh's chapter on obesity merits serious consideration, and the last chapter, on the nutritional requirements for individual work, is serviceable, and would be even better if the sections on hot and cold environments were expanded Less happy chapters deal with rickets and calcium metabolism

The North American point of view is not as a rule over-emphasised, but some important contributions made on this side of the Atlantic escape mention

Cerebral Angiography

P ALMEIDA LIMA, professor of neurology, Lisbon Faculty of Medicine London Oxford University Press 1950 Pp 221 £2 5s

THIS is the first textbook on this subject to appear since Professor Lima's predecessor, Prof Egas Moniz, began his work on the subject nearly 25 years ago It will therefore be read with great interest by all concerned with the diagnosis of intracranial lesions The text is clearly written and there is much material to illustrate vascular abnormalities and the displacements caused by intracranial lesions, together with a sound exposition of the normal anatomy of the vascular system inside the skull But very few anteroposterior angiographic studies are shown and Professor Lima does not seem to use oblique projections Their absence makes it more difficult for the reader to obtain a mental picture of the direction of the displacements and their source The adherence by the writer to surgical exposure of the common carotid artery, and to 'Thorotrast' as a contrast medium, will rouse controversy The operation has been almost universally superseded by the percutaneous method of injection, which is here briefly dismissed, and thorotrast has been discarded by most workers as radioactive and therefore potentially dangerous Other media at present available are not without their disadvantages, and Professor Lima's arguments in favour of thorotrast will be read with interest

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The Medical Annual, 1950 (Bristol John Wright & Sons 1950 Pp 440 25s)—The "annual" fully conforms to its accustomed high standard As editors, Sir Henry Tidy and Prof A Rendle Short have had in mind almost all the advance points of medicine surgery, obstetrics, and gynæcology, and show their usual wise caution in the acceptance of early unproved work The illustrations are good and to the point Among important items are first-class reviews of leucotomy by Dr E W Anderson, and of the PULHEEMS medical classification by Dr R P Fletcher, there are besides many details of 'Aureomycin' Q fever, radioactive isotopes, and other current topics

New and Nonofficial Remedies 1950 (London J B Lippincott Pp 800 27s)—This annual volume is known to British pharmacologists and manufacturing chemists as a valuable supplement to official American publications It describes preparations and articles which have been examined and accepted by the American Medical Association's council of pharmacy and chemistry, and it also contains a list of products that have not been accepted

Analgesia for Normal Childbirth (Oxford Blackwell Scientific Publications 1950 Pp 19 2s)—This is a small guide to the use of N_2O air analgesia in the course of normal labour, and it is intended mainly for midwives Notes are given on the construction, care, and maintenance of the standard apparatus, together with causes of failure and contra indications to its use The author, Dr E H Seward, holds diplomas in both anæsthetics and obstetrics and has been awarded a Nuffield scholarship for research into the relief of pain in childbirth He discharges his present task simply and ably

The Microscopic Diagnosis of Human Malaria (Studies from the Institute for Medical Research, Federation of Malaya Kuala Lumpur Government Press 1948 5 Malayan dollars—about 15s, post free)—Dr John W Field is to be congratulated on his concise and extremely well illustrated volume, giving all the information necessary for the microscopical diagnosis of the human malarias Both the initiate and the expert worker in the field of medicine in the tropics will value it, and so will the pathologist in this country, now so often called upon to make a microscopical diagnosis (the *only* effective diagnosis) in cases of suspected relapse of malaria Speculative diagnosis and speculative treatment of malaria are generally undesirable, this book shows how they can be avoided

Essentials of Materia Medica, Pharmacology, and Therapeutics (5th ed London J & A Churchill 1950. Pp 438 21s)—A new edition of "Micks" can always be sure of a cordial reception The stimulating and at times combative style in which it is written arouses and maintains the student's interest In this edition recent work receives due attention and its assimilation has been complete In the preface to his first edition, Prof R H. Micks said that he had not refrained from giving personal views on subjects when it would be cowardly not to do so, and readers will observe that his courage has not declined during the fifteen years that have since passed It is on one or two of the issues raised in this way that criticism may fairly be made His forthright condemnation of intravenous iron preparations, and his well known opinions on the use of glucose in diabetic coma, might have been expressed with regard to the existence of opposing schools of thought

It is the author's aim to provide a background to the intelligent use of drugs, rather than offer extensive information about drug preparations Nevertheless, short lists of important official preparations, placed at the ends of chapters, might make the book still more instructive

Operative Surgery (3rd ed London Oxford University Press 1950 Pp 559 30s)—This book, intended for senior students and young graduates engaged in surgical work in hospitals, and as a basis for those reading for higher surgical diplomas, is a summary of Edinburgh surgical practice by 24 distinguished contributors, all of whom either work or have been trained in that great school The editors, Mr Alexander Miles and Sir James Learmonth, have made a small scale map of operative surgery, giving the general lie of the land Its detail in text and illustration is not complete enough to help the fully fledged specialist in his specialty, or to enable those faced with unfamiliar operations to perform them The brain, the ear, the eye, and the female genitalia are not considered, and space precludes descriptions of alternative methods of doing the operations described

Any surgeon who reviews a book on operative surgery inevitably finds small points in technique with which he disagrees For example, in splenectomy, the hand is a better retractor of the spleen than the retractor shown in fig 214 the angular vein should never be ligated in carbuncle of the face, and hot boracic fomentations are actively harmful as a postoperative treatment of pulp whitlows To set against petty personal differences of opinion there are whole chapters of the first quality—e g, that on the general technique of abdominal surgery This book is highly recommended to those for whom it is written.

munity, and this is an aspect of medical training which, though mentioned by the Goodenough Committee,[12] is too often overlooked in the eternal discussion of technical details It is a paradox that those boys and girls who choose a profession in which they will have to offer mature counsel on any and every human problem should be the very ones who are first diverted from the broad educational road on to the narrow path of specialisation When, furthermore, the odds are heavily against their passing the first hurdle, and even the lucky minority cannot be sure of admission to a preclinical course, the sense of frustration among teachers and pupils alike is easily understood The low pass-rate of London external candidates is not easy to explain It is hardly surprising that many schools cannot offer groups of half a dozen pupils the facilities which universities can provide for classes of fifty, but when large and wealthy schools with ample resources seem to do little better than the rest, one is forced to conclude that some other factor is at work. One suggestion is that schoolchildren of 16 are not always ready to assimilate material which 18 year-old university students absorb comfortably in a year Schoolmasters, however, argue that the fault lies simply in the syllabus, parts of which are too wide and too vague to be covered in the time [13]

As Mr BIRLEY observed, the examination is historically a university one, and was once an integral part of the university training in medicine Even today many London schools prefer, and some insist, that students should attend the internal premedical course, thus permitting them to pursue a general education until they begin medicine, and ensuring continuity of medical teaching At least one university, however, has contributed to the present unsatisfactory state of affairs by virtually abolishing premedical instruction, and so compelling schools to provide it This retrograde step might appear justified by the Goodenough Committee's recommendation that the basic sciences should be taught at school, but the committee was careful to add that such teaching should form part of general education spread over a period of years, with no professional examination in view [12] It went further and proposed to abolish the premedical year as well as the examination, but this would involve shortening the course and does not find much favour today Instead, London University is now considering a plan to create an eight-term preclinical course which would be followed at medical school This is clearly in harmony with the spirit, if not the letter, of the Goodenough report

We believe that doctors should have the widest education which society can afford to give them Premature specialisation tends not only to stunt personal development but also to prevent the attainment of that full professional stature which enables a man to do his best work. It is as detrimental to the profession as to the individual that the doctors of the future should begin their vocational training too early, and the fact that this training necessarily takes a long time does not justify the demand that it should start at school, at an age when the studies of other boys are still unrestricted. If the 1st M.B is to be retained it should become again a purely internal university examination, thus allowing candidates to complete their general education, to make their final choice of a career slightly later, and to enter medical school at an age when they are more likely to derive the greatest benefit from a very exacting training The London University plan, as we understand it, would have all these merits, in addition to others which it is too early to discuss

12 Report of the Interdepartmental Committee on Medical Schools H M Stationery Office 1944 See *Lancet*, 1944 II 119
13 Ounsted J Schardt, R G *Lancet* 1950 I 43

Rice Diet In Hypertension

IN the six years since KEMPNER introduced his rice diet for the treatment of hypertensive vascular disease, the large amount of work done has shown that it favourably modifies the natural course of the condition. At the same time certain disadvantages and dangers have been defined

This week we publish a Medical Research Council report describing an English trial of the treatment The test group was restricted to patients who, during at least ten days in hospital on bed rest, showed an average diastolic blood pressure of at least 120 mm Hg In 35 such cases put on the rice diet the average fall of blood-pressure was 55/26 mm Hg, and of 33 patients with symptoms referable to hypertension 25 obtained relief. These results agree remarkably closely with those reported by WATKIN et al [1] in 50 patients with advanced essential hypertension. In both series not only was the blood-pressure lowered, and symptoms relieved, but improvement was sometimes apparent in the size of the heart, the condition of the retina, and the electrocardiographic findings These and other reports provide convincing evidence that the beneficial effect is largely, if not wholly, due to the very low sodium content of the diet (less than 200 mg per day) The administration of sodium chloride, or even transfer to a conventional low-sodium diet (less than 2 g per day), results in a steady rise in blood pressure though not necessarily the reappearance of symptoms The American workers noted a decline to normal of the blood cholesterol [2], but, while regarding this as a step in the right direction, they felt unable to state whether it had any significant effect on the course of the disease On the question whether nitrogen balance can be achieved on this diet, the M.R C report states that the 3 patients in whom this factor was observed were still in slightly negative balance at the end of six weeks, the American report, while confirming this observation in the early weeks of treatment, found that the nitrogen deficit diminished later and that virtual balance was eventually reached in some cases This point was studied by DOLE et al [3] who found that equilibrium was reached in three to five months, with larger subjects taking the longer time

Now for the disadvantages The treatment has one real danger in that such extreme salt reduction depresses the glomerular filtration rate and to a less extent tubular reabsorption Impaired renal function was observed by MCCANCE [4] in normal subjects during salt starvation and has been noted by several investigators of the rice diet, in fact one patient

1 Watkin D M. Froeb H F Hatch F T Gutman A B *Amer J Med* October 1950 p 425 441
2 Starke H *Ibid* p 494
3 Dole V P Dahl L K. Cotzias G C Eder H A Krebs M E *J clin Invest* 1950 29 1189
4 McCance R A. *Lancet* 1936 I 823

the most generally useful, for it is almost invariably positive in true cases of smallpox, and with it a laboratory report can be given in a day Egg culture of material from the focal lesions at any stage of development is the most certain method, but the smallpox virus takes 2–3 days to produce lesions on the chorio allantois which can readily be distinguished from those of vaccinia virus These methods have proved their worth in years of routine practice, in the second of the two papers on smallpox in this issue, Dr MacCallum, director of the Medical Research Council's Virus Reference Laboratory, and two clinical colleagues, discuss their ways of applying them and confirm their reliability A different test has been investigated by Collier and Schonfeld [5] in Indonesia, where they have examined more than 2000 samples of serum from cases of variola for anti-hæmagglutinins to the virus This test established the diagnosis in some cases on the fifth day of illness, but the titre of antibody reaches its maximum 7–10 days later, when complement-fixing antibodies may also be present in the patient's serum Though less useful in the early stages of the disease, this may be a valuable ancillary test where egg culture is impracticable Vaccination also gives rise to serum anti-hæmagglutinins, but this is said not to be a serious source of confusion

The work of Fenner [6] on experimental ectromelia in mice reminds us how little we know about the pathogenesis of some of the common exanthems There seems little doubt that the virus spreads from one patient to another directly by the respiratory route, though Downie and Dumbell [7] showed that in closed communities infected dust may play a part in dissemination Many clinicians hold that smallpox is infectious in the febrile period before the exanthem develops, but others deny this MacCallum and his colleagues support the view that variola virus is inspired into the lung, where a primary focus develops, eventually involving the capillaries and giving rise to the viræmia and perhaps also enabling virus to reach the bronchial secretions On the analogy of Fenner's findings in ectromelia one might expect to find an initial focus as the source of the primary viræmia, but this speculation has still to be backed by evidence, for recovery of the virus from the lung of a fatal case means very little If smallpox is infectious in the pre eruptive stages one might expect virus to be recoverable from throat swabs or tracheo bronchial secretions, but in neither of the present investigations were attempts successful It is more likely that smallpox becomes infectious only when the focal lesions that appear early on the mucosa of the oropharynx discharge their virus into the secretions Professor Downie and the two members of his department in Liverpool noted that on the third day of illness one of their patients had only a faint macular rash on the face though there were 8 well developed lesions on the dorsum of the tongue More attention might be given to the time relations of the appearance and development of lesions on the mucosa and on the skin

A striking feature of the clinical course of smallpox is the rapid disappearance of severe prodromal symptoms as the rash comes out It seems certain that the virus is present in the blood stream in the early febrile stages, and both groups of investigators have recovered the organism from the blood It may be objected that five of the six positive blood cultures came from patients who were so severely infected that they died soon afterwards, but virus was also recovered from the blood of one of the moderately severe Liverpool cases on the first day of illness though not on the second The fall in temperature and general improvement in the average patient as the rash comes out is explained by the rapid appearance of neutralising antibody, whereas severe hæmorrhagic cases do not develop enough antibodies to cope with a massive invasion The transient viræmia in moderately severe cases may also be explained on the time relations of virus liberation and antibody production There are no grounds for believing that virus is disseminated to the skin before the temperature rises, and Dixon's [8] careful clinical observations in North Africa support the contrary view The sudden flooding of the blood stream with virus and its almost equally sudden suppression might form a basis for the use of blood cultures in smallpox diagnosis, and this method might make a very early diagnosis possible in contacts who are under close supervision

A Controversial Examination

The Headmaster of Eton was on firm ground when, as we reported last week, he attacked the growing practice of taking the 1st M B at school He held that this encourages premature specialisation at the expense of the broader education which the General Certificate is designed to promote, and he pointed out that the examination is acting as a filter in selecting the future members of the medical profession—a filter which often fails to pass students who have been very carefully chosen for admission to a medical school [9]

Mr Birley was speaking at a meeting of the Royal Society of Medicine, and his views apparently met with the approval of his audience, at least, they were not seriously opposed The thesis that the 1st M B has a selective function has in the past been disputed by a London University examiner [10], but every examination is selective in direct proportion to the failure rate among those attempting it, and the failure rate among candidates for the London external 1st M B is said to be about 85% The argument in favour of sitting this highly selective examination at school has been presented in our columns by Dr Harold Scarborough,[11] but even he envisaged a change in its form His argument was based on the student's need to acquire a "secure foundation in science" before entering a medical school, but he did not explain precisely what he meant by a "secure foundation" science to School Certificate or matriculation standard might well be so described There must be many schools which can easily provide instruction up to this standard but which find tuition for the 1st M B an undue strain on their resources

A sound liberal education is at least as important to a doctor as it is to any other member of the com-

5 Collier W A, Schönfeld J K *Med J Aust* 1950, 2 363
6 Fenner F *Lancet* 1948 ii 915 *J Immunol* 1949 63 341
7 Downie A W, Dumbell K R *Lancet* 1947 i 550
8 Dixon C W *J Hyg Camb* 1948 46 351
9 Johnson M L *Lancet*, 1949 ii 520
10 Hentschel, C C *Ibid* p 115
11 Scarborough H *Ibid*, p 368

rheumatoid sera but not with normal sera however, the positive reactions with the rheumatoid sera occurred as frequently with the "normal" antigen as with the antigen from rheumatoid tissue, so that the experiments lend no support to the hypothesis of an altered connective tissue acting as an antigen

Whether these two reactions are in any way directly related cannot yet be said it has become clear that a large number of the "colloidal reactions" in hepatic disease are all essentially modified tests for the presence of increased quantities of γ-globulin and it seems equally likely that many of the reactions observed in rheumatoid arthritis may be found eventually to be due to some common factor The rapid progress in the study of the disease with Cortisone' and A.C.T.H 'makes it likely that an answer will be discovered sooner rather than later

ACROSS THE CHANNEL

ONE of the objectives of the Brussels Treaty is "to develop on corresponding lines the social and other related services" of the five countries of Western Union In public health a beginning has been made with personal contacts between officials and exchange of information

Dr N M. Goodman in his Chadwick lecture of Oct 24, sketched the public health administration of Belgium, France, Luxembourg, and the Netherlands, and pointed to some of the differences from our own. The French and Belgians, he said, regard administration as a science, the British regard it as an art (or even a craft), and the Dutch are somewhere between the two In other words, the Franco-Belgian approach is logical and sometimes (in British eyes) unpractical, the British approach is practical and nearly always illogical. The Dutch tradition of individual and local self-reliance has tended towards a conservation of voluntary effort in public health as well as other fields, the French, and to a lesser extent the Belgian, systems owe much to the Napoleonic concepts of the *droit administratif* and of centralisation, while the British tradition of sanitary reform has fixed the broad lines of our public health system on a local basis Except in the older and larger municipalities (where he is sometimes a part-time clinician) the M.O.H in the other Western Union countries is generally an employee of the central government, responsible to the prefect or governor of his department (county) as well as to the local municipal council. In France each department has a full time director of health. In all the countries, except ours doctors and other technical health staff are eligible for, and in fact hold, executive positions on a par with those of lay administrators thus in France, Belgium and the Netherlands the permanent heads of the health ministries are doctors, and so are the directors of most of the divisions dealing directly with health. In Britain, of course, doctors in central health departments are advisory not executive, but Ethiopia said Dr Goodman, 'is I believe the only other country in the world, including the Dominions which follows our example" Perhaps we are too apt, he added, "to think of something as strange and peculiar because we do not do it ourselves whereas inquiry will show that it is we who are peculiar and in a minority." In public health the convergent development aimed at by the Brussels Treaty will be attainable only if we begin by knowing something about the organisation in the other Western Union countries

Dr Goodman also had some cogent things to say about instruction in public health His impression is that the instruction of undergraduates in this subject is more thorough on the Continent than in some at least of our own schools For postgraduates we have had a statutory course and diploma controlled by the General Medical Council for 64 years whereas in the other countries uniformity of standards has only lately been introduced. "On the other hand the creation of a French National School of Public Health in 1947 in Paris, and the striking fall in the number of D.P.H. students in this country since 1948, make it look as if we were in some danger of losing our longstanding lead in public health training Indeed, unless the position here changes—as no doubt it will—we may find it impossible to fill the vacancies for public-health medical officers, which is already causing difficulty in the central services"

TISSUE STAGE OF MALARIA PARASITES

THE existence of tissue forms of the malaria parasite in man and other mammals had been postulated for twenty years before Shortt and Garnham in 1948 located the long sought parasites in the parenchyma cells of the liver, where they were unexpectedly large They were demonstrated first with *P cynomolgi*[1] in monkeys, and then with *P vivax*,[2] and lastly *P falciparum*[3] in biopsy specimens from volunteers These discoveries were acclaimed by malariologists throughout the world, but a dissenting voice has now been raised by Dr Clay G Huff, one of the leading American parasitologists, who has done classical work on the development of the sporozoites of avian malaria through cryptozoites in the reticulo-endothelial cells to reach the familiar forms in the red cells In a letter published in America Huff[4] points out that no one has yet demonstrated the stage connecting the sporozoites with the forms found in the liver four days later Material supplied by Shortt has been fixed and stained by Huff's methods and Huff has found differences between the bodies that Shortt described and the recognised forms of the avian and saurian plasmodia He concludes that "there seems to be no alternative to doubting the malarial nature of the bodies described by Colonel Shortt and his collaborators" He does not deny that these bodies may be exoerythrocytic forms of malaria, but he urges that much more work is needed before the claim can be considered proved

Further research, particularly into the development of the sporozoites during the first four days, is certainly desirable, but there are good reasons for expecting it to confirm the claim The objects seen in liver sections when fixed with Carnoy and stained with Giemsa, are fundamentally similar to the tissue forms of avian malaria, though Huff's technique of fixing in Zenker-formol and staining by Maximow's method has led to different results Then the ripening into merozoites on the 8th to 10th day (*P cynomolgi*) fits exactly with the time at which the blood first becomes infective on subinoculation. Moreover, the findings of Shortt and Garnham with *P cynomolgi* have been completely confirmed, on different material, at the National Institute for Medical Research[5] The appearance of the parasites with only a single generation between the sporozoite and the forms in the blood agrees with the fact that liver tissue (even if it contains parasites) does not become infective on subinoculation until the 8th day Large numbers of human liver sections, taken at necropsies have been diligently searched as controls and have not yielded any objects resembling those found by Shortt and his colleagues in their biopsies taken from the volunteers just when the presence of the pre erythrocytic forms had been foretold. One may therefore safely predict that future work will remove even the last lingering doubts

1 Shortt H E Garnham P C C *Nature Lond* 1948 161 126 With Malamo- B *Brit med J* 1948 i 192
2 Shortt H E. Garnham P C C Covell, G Shute P G *Brit med J* 1948 i 547
3 Shortt H E., Hamilton Fairley N., Covell G Shute P G., Garnham P C C *Ibid* 1949 ii 1006
4 Huff C G *Trop Med News* 1950 7 22
5 Hawking F Perry W L M. Thurston J P *Lancet* 1948, i, 783

mentioned in the M R C report died of uræmia while under treatment It appears that a kidney already damaged by hypertensive disease may be unable to conserve sodium chloride, with resulting dangerous hypochloræmia, so, if the urinary sodium or chloride does not fall to a low level within a few days of starting the diet, blood urea and blood sodium must be carefully observed Indeed it seems, on the evidence to date, that renal failure is an absolute contra indication to sodium starvation A quite unexpected and severe complication encountered by WATKIN and his colleagues was the activation of peptic ulceration in patients who had previously had ulcers They attributed it to the acid fruit juices, roughage, and perhaps the low protein content of the rice diet The biggest disadvantage, however, is the unpalatable monotony of the diet To practise it at all requires a high degree of cooperation between patient, physician, and dietitian, and a proportion of patients will not tolerate it at any price Though some measure of success has been achieved with outpatients in America, rationing and related dietetic difficulties make it less likely that in this country it could be successfully used outside the metabolic ward.

Nevertheless, on the purely experimental side the rice diet is a development of great promise It offers a new approach, or rather it suggests that an old approach was after all important, for it is only just to recollect that forty-five years ago AMBARD and BEAUJARD [5] propounded the theory that hypertension results from the retention of sodium chloride Imagination readily spins a web of association We now know that the hypotension of Addison's disease can be mitigated with sodium, that deoxycortone can check the sodium wastage and raise the blood pressure even to abnormal heights, and that the presence of cortical suprarenal tissue is essential to the experimental hypertension of the Goldblatt clamp Sodium is coming into its own—*natrium redivivum*

5 Ambard L, Beaujard, E *Sem méd* 1905 25 133

Annotations

GEORGE BERNARD SHAW

A GENERATION which has carried two world wars and not unreasonably expects further calamities has had its compensations, and not the least of these has been the fearful joy of living alongside Mr Shaw All our lives he has been inviting us to laugh and think—not occasionally or slightly, but as though the fountain of his hospitality would never run dry When he came into his powers, in the '90s, accepted forms and standards had not been examined closely for the best part of a century, and it was still possible to be smug about progress Into this sleeping palace Shaw burst like a poltergeist into the Athenæum, tossing the furniture about seemingly at random Looking back it is clear that there was nothing random about it, though he ranged widely in his attacks against stupidity, the method has always been the same He decided what he was going to say and then said it as provocatively and amusingly as he knew how And he knew how The characters in his plays are said to be puppets all talking Shaw, but the effect is never of a puppet show, for a world peopled by a race of Shaws is inevitably livelier than a world peopled by the rest of us It was a device which enabled him to argue on both sides, and since he was a glorious debater his audiences, whatever the individual opinions among them, had the sensation of giving hard knocks as well as taking them This is not to say that he was always either fully informed or fully scrupulous in presenting evidence in attacking animal experiment, for example, he took the untenable line that no good has ever come of it, and in his robust assault on the medical profession in *The Doctor's Dilemma* he made no serious attempt to be fair It does not matter in the least the argument is the thing, the argument which goads and delights and provokes the mind into wakefulness Though science was one of his favourite cockshies he preached a curiously scientific message nothing is to be taken on trust, nothing must be regarded as proven for good, opinion must never be confused with fact, or prejudice with principle He never pretended to know all the answers, he was, as he said in *Too True to be Good*, a preacher, and the business of a preacher is to preach "You are reasoning animals," he seems to say again and again, "for heaven's sake use your reason" It is an exacting doctrine, and one which seems to take no account of the hidden springs of our behaviour Yet in *Man and Superman* his analysis of the complementary drives in men and women runs very close to the views which Freud was achieving by a less intuitive process

To Shaw social justice seemed not so much a moral ideal as a common sense necessity (his only interest in the poor, he said, was to abolish them), and this unsentimental approach brought him a reputation for sparkling coldness, which those who knew him personally knew well was undeserved The high spirit—and high spirits—which kindled the Fabians and helped to set in train the social reforms of our century (he has lived to see most of the poor abolished in this country) lasted him to the end

SERUM FACTORS IN RHEUMATOID ARTHRITIS

THOUGH patients with rheumatoid arthritis show certain changes commonly found in chronic infections—such as increased sedimentation rate, leucocytosis, and alteration in serum protein—no infective agent has been found, and the cause of these changes is still unknown

In this issue Dr Ball describes careful studies of the phenomenon first described by Rose et al [1] in 1948, when it was found that the serum of patients with rheumatoid arthritis agglutinated sheep cells sensitised with a rabbit anti sheep cell serum the agglutinin was not the common heterophil antibody, and was not removed by absorption with unsensitised cells Ball reports that of 895 cases of various types the reaction was found positive in 153, and of these 140 were cases of rheumatoid arthritis the remaining positive reactions were all in cases of arthritic disease, not diagnosed as rheumatoid arthritis, and included 3 examples of disseminated lupus erythematosus and 1 of dermatomyositis Of 134 non arthritic patients, not one gave a positive reaction The "serum factor" responsible for this reaction—and Ball is careful not to call it an antibody—is entirely unknown, but it seems to be closely associated with the group of "collagen diseases"

Lansbury et al [2] have tackled the question whether some of the changes in rheumatoid arthritis are due to the connective tissue being altered in some way, and thereby acting as a foreign substance and leading to antibody formation They prepared antigens from rheumatoid material—i e, rheumatoid nodules and rheumatoid joint material—and from normal joint material, and carried out precipitin and complement-fixation tests The latter led to no clear results Positive precipitin reactions were obtained with a number of

1 Rose H M Ragan C Pearce E Lipman M. O *Proc Soc exp Biol N Y* 1948 68 1
2 Lansbury J Crosby W R Bello C T *Amer J med Sci* 1950 220 414

Public Health

B C G VACCINATION OF NURSES AND STUDENTS IN EDINBURGH

H G H. HOUGHTON M.B Edin, M.R C.P.E
N W HORNE M.B Edin., M.R C.P.E

From the Tuberculosis Service of the South-Eastern Regional Hospital Board, Scotland, and the Department of Tuberculosis, University of Edinburgh

SINCE the start of the scheme of B C G vaccination in Edinburgh, 1350 hospital nurses and 1302 medical students have been tuberculin tested, and of these, 221 nurses and 208 students have been vaccinated with B C G The nurses were tested at sixteen general and special hospitals, but not at tuberculosis hospitals since tuberculin testing is there a routine measure The students were drawn from the university, the school of medicine of the Royal Colleges, the dental school, and the Royal Dick Veterinary College

ORGANISATION

Because mass tuberculin testing and B C G vaccination had not hitherto been done in this country, certain difficulties were envisaged The policy was that all persons tested or vaccinated should be volunteers, no compulsion being used It was essential therefore to gain the confidence and full coöperation of all concerned The main obstacles anticipated were

1 Hostility by the individual, parent, or guardian to tuberculin testing or B C G vaccination.

2 The difficulty experienced by hospital matrons in releasing staff from duty during the present shortage of nurses In addition, nurses might have difficulty in reporting on account of sickness, days off, holidays, or night duty

3 Failure to report for reading of the tuberculin test

4 The necessity for a negative reactor, who was given B C G and again tuberculin tested, to attend at least five times and usually six or more times

The following procedure was adopted

(*a*) Preliminary personal interviews with medical superintendents matrons and professors and lecturers resulted in their full coöperation. Prof Charles Cameron, who inaugurated the vaccination scheme gave short talks to each group two days or so before tuberculin testing was to be done, explaining in simple terms the significance of tuberculin testing and the object of B C G vaccination. This did much to dispel fears about B C.G

(*b*) Nurses were tested at the hospital at a time chosen by the matron. Sometimes this would mean visits at 8 A.M or 9 P.M. in order to include day and night staff. At smaller hospitals usually four visits were necessary to complete the testing but at one large teaching hospital it was necessary to make fourteen short visits to complete the testing of 170 nurses the only suitable times being immediately after meals Particulars were entered in books by a secretary, and each individual was handed a card with the book number and instructions where and when to attend for reading

(c) Students attended the mass-radiography centre Each student received a letter giving him a time of attendance His chest was radiographed and he was tuberculin tested and then handed a card stating where and when to return. Those who failed to return received postcards asking them to report immediately

(*d*) The necessity for B C G vaccination was explained to each negative reactor, and written consent was sought If under 21 years of age the individual was asked to address a letter to the parent or guardian This letter signed by the matron or by the senior physician to the students health service explained the nature of B C G and requested authority for vaccination.

METHOD OF TUBERCULIN TESTING

The Mantoux test was used the initial dose being 0 1 ml. of a 1 in 1000 dilution of Koch's old tuberculin (0 1 mg), freshly prepared standard human tuberculin, made by Messrs Burroughs, Wellcome & Co, was used The test was read in 48–72 hours, and, if it was negative, 1 mg was given The initial dilution of 1 in 1000 was used because, although we anticipated some severe reactions, we hoped, by eliminating those who would fail to react to a weaker strength, to reduce the number of attendances—there is great difficulty in reassembling students and nurses For the result to be recorded as positive, the area of induration had to be at least 5 mm in diameter The following grading was adopted

Diameter of indurated area (mm)	*Reaction grade*
5–9	+
10–19	++
20 or more	+++

TUBERCULIN TESTING

No attempt has been made to subdivide the groups by sex or by country of origin or to include information on contact or previous history of tuberculosis Approximately 70% of the students and 70% of the nurses were Scottish

Up to the end of March, 1950, 77 4% of all students investigated and 76 6% of all hospital nurses had volunteered for tuberculin testing The hospital establishments included 1124 student nurses, who constituted 64 8% of the total nursing staffs From table III it will be seen that the number of nurses tested in the first four years of training was 928, and these constituted 69 5% of the total tested The majority of those not tested were in the older age groups, and were people who either refused testing or were not interested in the scheme In some hospitals very few sisters presented themselves for testing, and the best response was obtained from the nurses when the matron and senior sisters volunteered

TABLE I—TUBERCULIN REACTION STATE OF STUDENTS AND HOSPITAL NURSES (ALL AGES AND ALL YEARS OF TRAINING)

Group	Total tested up to March 31 1950	Reaction to 0 1 mg or 1 mg O T			
		Positive		Negative	
		No	%	No	%
Students	1302	1075	82 6	227	17·4
Nurses	1350	1115	82·6	235	17 4

Table I shows that of the total number tested 82 6% gave positive reactions, the percentages for nurses and students being the same These figures are similar to those obtained in the Prophit survey (1948)

Table II shows that the incidence of tuberculin sensitivity, as is well known, increases with age, but there is

TABLE II—TUBERCULIN SENSITIVITY RELATED TO AGE *

Group	Age (years)	Total tested	Positive to 0 1 mg or 1 mg O T		Negative to 1 mg O T	
			No	%	No	%
Students	–17	29	19	65 5	10	34 5
	18–19	219	164	74 9	55	25 1
	20–21	341	266	78 8	75	21 2
	22–23	292	239	81 8	53	18·2
	24–25	173	153	88 4	20	11 6
	26 +	248	234	94 4	14	5·6
	—	1302	1075	82·6	227	17 4
Nurses	–17	47	26	55 3	21	44 7
	18–19	360	255	70 8	105	29 2
	20–21	226	172	76 1	54	23 9
	22–23	168	146	86 9	22	13 1
	24–25	113	101	89 4	12	10 6
	26 +	436	415	95 2	21	4 8
	—	1350	1115	82·6	235	17 4

* The figures in this table are the result of the combined influence of age and occupational risk.

CANCER REGISTRATION

IN England and Wales, as in France and Denmark, an attempt is being made to secure registration of all cases of cancer A start was made by the Radium Commission in 1930, and the Cancer Act of 1939 included some provision for records The present undertaking was initiated in 1945, and since 1947 the General Register Office has acted as the central statistical bureau Dr Percy Stocks, the chief medical statistician, now reports [1] that by 1948 about half the new cases of cancer were being recorded The task is not easy sometimes patients cannot be traced for follow up purposes, and so the General Register Office has arranged to notify the registering centre of the date and cause of death of a registered cancer patient, registration of patients treated privately may not be readily secured, and confusion may follow from a patient registering at one centre and later receiving treatment elsewhere Since hospitals cannot fail to see the value of this work, the coöperation necessary for full registration will no doubt be forthcoming One of the most important benefits will be a balanced view of different methods in different hands In Dr Stocks's words "besides knowing the best results obtainable by radiotherapy and by surgery, we want to know the average prospect for patients living in different regions of the country who are receiving such treatment as is available to them in respect of cancer of each site"

B C G VACCINATION

OFFICIAL trials of B C G vaccine have started only lately in Britain, but for some time previously work had been proceeding here and in Ireland A reminder of this is given by Dr Houghton and Dr Horne, whose report from Edinburgh appears elsewhere in this issue, and to the names they mention might be added those of Price [2] and Dunlevy,[3] of Dublin, and Purser,[4] of Belfast

All these workers agree that B C G vaccination is safe Their results cannot yet be assessed, but at the time they reported not one of all those vaccinated—about 2500 in all—had contracted tuberculosis Dunlevy encountered one axillary abscess in a thousand vaccinations, and Purser two in a similar series, while Wallgren [5] reports an average of only one abscess each year in Sweden In Edinburgh there have been no such complications, and the number of defaulters may perhaps be partly explained by the local reactions of 20 mm and over which developed in 8 9% of the nurses during the preliminary Mantoux testing If it was impracticable to give each of the customary three doses of 1, 10, and 100 T U, it might have been wiser to omit the second rather than the first The conversion rate was satisfactorily high in all these series except one The figures are Price, 100%, Dunlevy, 99 8%, Purser, 99 8%, Houghton and Horne, with vaccine "A" 100%, and with vaccine "B" 96% These last two results suggest that not all strains of B C G are alike in their sensitising properties, especially as vaccine "B" was being used in double strength Attention has been drawn to morphological difference between two other strains by van Deinse et al,[6] according to whom the French B C G grown by Calmette's technique measures 3 μ in length, while the Danish strain grown throughout on Sauton's medium is now only 2 μ in length and is proportionately diminished in its other two dimensions This means that, weight for weight, the Danish B C G contains more than three times as many organisms as the French

Further reports from Edinburgh will be especially interesting for their description of the reversion rate twelve months after vaccination with the two strains. The work carried out so far should warn vaccinators that if they use vaccines from different sources they must be prepared for different reactions and results

INTERNATIONAL COURSE IN AUDIOLOGY

A SUCCESSFUL course of instruction in audiology—the science of hearing—was held in Stockholm from Sept 11 to 20 under the chairmanship of Prof Gunnar Holmgren The first of its kind ever held, this International Course in Audiology was opened by H R H Princess Sibylla of Sweden in the presence of 258 participants, of whom 34 came from Great Britain On the opening morning there were introductory lectures by Professor Holmgren, Dr Julius Lempert, and Mr Terence Cawthorne In all, 24 countries were represented, and the 258 included 41 teachers from 13 countries The course of instruction was divided into lectures in four parallel series, there being some eighty in all, and five practical courses, or seminars, on audiometry and hearing aids, hard of hearing children, basic audiology, and temporal bone surgery with especial reference to the fenestration operation These were so arranged that each participant could attend two practical courses each day in addition to three lectures Films, demonstrations at the Royal Institute of Technology, and demonstrations of operations by Prof Torsten Skoog and Dr Paul Frenckner at the Karolinska and the Southern Hospitals were also arranged There was also a visit to the new ear, nose, and throat clinic at Uppsala which is under the direction of Prof C O Nylen

At a banquet in the famous Town Hall on Sept 16, many tributes were paid to the organising committee and to its chairman, Professor Holmgren, whose reputation and personality had attracted such a large attendance Already arrangements for another course are being considered.

REGISTRARS' TOCSIN

IN England and Wales the number of registrar posts is at last to be brought into line with the likely number of consultant vacancies According to the Ministry of Health, whose statement is summarised on a later page, senior registrars and registrars each number at present upwards of 1400, and the totals are to be reduced as soon as possible to the region of 600 for senior registrars and 1100 for registrars For these doctors this is grim news—but exactly how grim will be known only when the review of numbers by specialties is completed in the New Year A survey in Scotland [1] showed that whereas the consultant openings, relative to registrar numbers, were numerous in some fields, such as radiodiagnosis, psychiatry, and tuberculosis, they were very few in others, such as general and orthopædic surgery, and these differences will no doubt be acknowledged in settling the distribution of registrarships within the new total establishment This sorry business may at least lead to a stronger link between consultants and general practitioners, for the Ministry suggests that where someone else must replace a senior registrar, a suitably qualified practitioner may be appointed as clinical assistant

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1 Studies on Medical and Population Subjects no 3 Cancer Registration in England and Wales an Enquiry into Treatment and its Results By PERCY STOCKS C.M G M D F R.C P chief medical statistician General Register Office H.M Stationery Office Pp 80 2s
2 Price D S *Tubercle* 1949 30 11
3 Dunlevy M *Irish J med. Sci* 1950 6 278
4 Purser H M *Ulster med J* 1950 19 42
5 Wallgren A Calmette Vaccination in Sweden Stockholm 1947
6 van Deinse F, et al *Ann Inst Pasteur* 1950 78 596

Dr ANGUS MACRAE has been appointed secretary of the British Medical Association in succession to Dr Charles Hill, M P Dr Macrae, who is a graduate of Edinburgh University, has been an assistant secretary of the association since 1935 and deputy secretary since 1948

1 See *Lancet* 1950 I 1166

Public Health

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Up to the end of March, 1950, 77 4% of all students investigated and 76 6% of all hospital nurses had volunteered for tuberculin testing The hospital establishments included 1124 student nurses, who constituted 64 8% of the total nursing staffs From table III it will be seen that the number of nurses tested in the first four years of training was 928, and these constituted 69 5% of the total tested The majority of those not tested were in the older age-groups, and were people who either refused testing or were not interested in the scheme In some hospitals very few sisters presented themselves for testing, and the best response was obtained from the nurses when the matron and senior sisters volunteered

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* The figures in this table are the result of the combined influence of age and occupational risk

here the additional factor that those whom we have tested undergo a definite occupational risk In those up to 17 years of age the incidence of tuberculin sensitivity is low, particularly among the nurses (55 3%) In the 24–25 age group the percentage of nurses who are positive is 89 4, and in those aged 26 and over the percentage rises to 95 2 Students show, at successive ages, a similar increase in the percentage of positive reactors, which rises from 65 5 at 17 years of age to 94 4 in those aged 26 and over

The numbers in the 17 year age group are small, but it seems that students in the group investigated (80% of whom were medical) and young nurses entering hospital in Edinburgh have lower tuberculin sensitivity than those included in the Prophit survey (1948) In this survey the percentage of positive reactors at the age of 17 was 81 4 of students and 71 8 of "other nurses"

Table III shows the tuberculin reaction related to year of training In both nurses and students the percentage of positive reactors rises with successive years of training, but the rate of this increase differs in the two groups In students, between the 1st and the 2nd years there is

TABLE III—TUBERCULIN SENSITIVITY RELATED TO YEAR OF TRAINING

Group	Year of training	Total tested	Positive to 0 1 mg or 1 mg O T		Negative to 1 mg O T	
			No	%	No	%
Students	1	245	189	77 1	56	22 9
	2	234	182	77 8	52	22 2
	3	315	258	81 9	57	18 1
	4	269	233	86 6	36	13 4
	5	234	208	88 9	26	11 1
	6 +	5	5	100 0	0	0
	—	1302	1075	82 6	227	17 4
Nurses	1	444	318	71 6	126	28 4
	2	153	118	77 1	35	22 9
	3	179	139	77 7	40	22 3
	4	152	135	88 8	17	11 2
	5	25	23	92 0	2	8 0
	6 +	397	382	96 2	15	3 8
	—	1350	1115	82 6	235	17 4

little change (0 7%), but between the 2nd and 3rd years there is a big increase (4 1%), and between the 3rd and 4th years a still greater increase (4 7%) In nurses there is an immediate increase of 6 5% in the 2nd year, a very small additional increase in the 3rd year (0 6%), and a big increase in the 4th year (11 1%)

From these figures it appears that, as might be expected the student in his earlier (preclinical) years is less exposed to infection than is the student nurse Both groups show a greater conversion rate between the 3rd and 4th years of training

The student group included 90 dental and 172 veterinary students During the first two years of training both these groups study subjects similar to those taken by 1st-year and 2nd year medical students, and, like medical students, they start clinical work in the 3rd year

Table IV shows that of those tested initially with 0 1 mg, 4 8% were negative to 0 1 mg but positive to a later dose of 1 mg This is important, because 3 students

TABLE IV—NUMBERS REACTING TO 0 1 MG AND 1 MG O T

Group	Total tested		0 1 mg O T				0 1 mg or 1 mg O T			
			Positive		Negative		Positive		Negative	
	No	%	No	%	No	%	No	%	No	%
Students	1097	100	850	77 5	247	22 5	903	82 3	194	17 7
Nurses	1052	100	834	79 3	218	20 7	885	84 1	167	15 9

TABLE V—NUMBERS VACCINATED WITH B C G

Group	Nurses	Students	Total
Vaccinated			
Subsequent tuberculin reaction known	181	136	317
Failed to report subsequently	3	24	27
Vaccinated less than 6 wks before this report	37	48	85
	—221 (94%)	—208 (91 6%)	—429 (92 9%)
Vaccination refused	10	4	14
Failed to come for vaccination	4	15	19
Total no of negative reactors	235	227	462

and 7 nurses who were included as negative reactors were in fact negative to 0 1 mg only They had failed to report for reading of the second Mantoux test (1 mg)

Severe reactions and complications—Of 1097 students and 1052 nurses tested initially with 0 1 mg, 78 students (7 1%) and 90 nurses (8 9%) had local areas of induration of 20 mm of more One nurse was off duty for three days suffering from pyrexia and complaining of a stiff arm Most stated that there was slight irritation and slight tightness of the skin at the site of injection For this reason, those nurses who worked in operating theatres had their injections into the skin over the deltoid region

In 2 instances chronic skin disease was exacerbated within two weeks of the Mantoux test—one case was of psoriasis in a nurse, and the other of generalised dermatitis in a student The nurse was Mantoux positive (+) to 0 1 mg, the student was negative to 0 1 mg but gave a ++ reaction to 1 mg

Despite a few severe reactions, we feel that we were justified in commencing with 0 1 mg rather than with weaker dilutions, since the use of this dose reduced considerably the number of attendances

B C G VACCINATION

Of the 462 people who did not react to tuberculin, 429 (92 9%) have been vaccinated with B C G The percentage of nurses (94%) is slightly higher than that of students (91 6%) Altogether 4 students and 10 nurses (3%) were not vaccinated because of refusal by the responsible person to consent to vaccination, 3 of these nurses have since been vaccinated as permission was subsequently given (see table V)

TABLE VI—PARTICULARS OF THE TWO VACCINES USED

Vaccine	Volume injected (ml)	Strength (mg per ml)	Dose (mg)
A	0 1	0 50	0 05
B	0 1	1 00	0 10

From table V it will be seen that of 462 persons, 19 (4 1%) failed to come for B C G vaccination after preliminary tuberculin testing, and of 344 who were vaccinated, 27 (7 8%) did not return for subsequent tuberculin testing In both instances the proportion of defaulters was higher in students than in nurses—6 6% compared to 1 7%, and 15% compared to 1 6% This difference is probably due to three factors (1) the majority of nurses live in hospital and can be brought together more easily than students who live at home, in lodgings, or in outside hostels, (2) the nurses underwent the tests at their place of work, whereas with students this was rarely possible since they are so scattered, and (3) the initial tuberculin test, the subsequent B C G vaccination, and the final tuberculin test involve several attendances spread over about nine weeks, causing greater difficulties to the student It is unlikely that these problems will

ise in the future as the nurse and student will be tuberculin-tested, and if necessary vaccinated with B C G, on entry to hospital or university

Technique —The intradermal method was used throughout The site of inoculation was the area of the outer surface of the left arm above the level of insertion of the deltoid muscle A no 26 needle and an accurately fitting tuberculin syringe were used No dressing was applied In most cases only one injection was made, but in some of the early vaccinations two injections, each of 0 05 ml of vaccine, were made, separated by a distance of about 2 cm (see below)

The vaccines used (vaccines A and B) were supplied officially from two different sources (see table VI) On the recommendation of the Medical Research Council vaccine B was given in a dose twice as large as that recommended by the suppliers

Tuberculin testing after vaccination —Although it is generally accepted that tuberculin sensitivity develops about six weeks after the entry of the tubercle bacillus into the body, we delayed the subsequent tuberculin testing until between the eighth and tenth weeks after vaccination. This was to allow for possible individual variations in the development of sensitivity, and for variations in the virulence of the vaccines used Subsequent experience proved that this was a wise procedure In determining tuberculin sensitivity it seemed reasonable—and it accords with current practice—to

TABLE VII—TUBERCULIN CONVERSION AFTER B C G VACCINATION

Vaccine	No vaccinated	No showing Mantoux conversion
A	92	92 (*100%*)
B	225	216 (*96%*)
Total	317	308 (*97 2%*)

accept the same standards after vaccination as before No person was accepted as having undergone Mantoux conversion who did not show a reaction to 1 mg or less of tuberculin

Mantoux reaction after vaccination —At an early stage of this work Professor Cameron called our attention to the fact that the tuberculin reaction after vaccination differed in certain respects from the reaction caused by a natural infection (A similar observation has been made by Prof Benjamin Viel, of Santiago)

In the Mantoux reaction which follows successful B C G vaccination the zone of initial erythema is often very large The erythema fades very rapidly and when the reaction is read at forty-eight hours it may be seen only as a faint pink staining of the skin The area of central swelling is of a livid plum colour, and although its margins can usually be fairly easily seen they are often difficult to define by palpation Even severe reactions rarely show the central pallor or necrosis which are typical of severe tuberculin reactions following natural infection, and they are not associated with discomfort We have not seen this feature described in detail, nor do we know its exact significance The majority of the reactions conformed to the natural conversion type

TABLE VIII—SIZE OF PAPULE AND TUBERCULIN ALLERGY AT ABOUT NINE WEEKS AFTER VACCINATION

Vaccine	No of papules	No in group	Papule av and range of diam. (mm)	Tuberculin sensitivity	
				Induration av and range of diam (mm)	Amount of tuberculin (mg)
A	2	58	11 8*(6–20)	11 4 (7–20)	0 1
A	1	31	7 2 (5–13)	10 4 (5–20)	0 1
B	1	12	5 6 (4–7)	9 7 (5–20)	0 1
B	1	105	5 6 (2–10)	13 8 (5–30)	1

* Average of the combined diameters of the two papules

Segregation —It was obviously impossible to segregate the group of nurses and students with whom this report is concerned Both must work, and the risk of being misled through their contracting infection during the pre allergic period had to be taken Wallgren (1948) has admitted that the Scandinavian authorities regard segregation as more important for the good repute of B C G vaccination than for its actual prophylactic value The danger to the vaccine's reputation of undetected infection—a risk which is always present unless segregation is absolute—is well illustrated in the outbreak of tuberculosis reported by Hyge (1947)

That B C G can be given safely to tuberculin positive subjects has been established by several investigators and the same was shown in respect of the vole bacillus by Cameron and Purdie (1946) The danger of the so called negative phase in the period of development of allergy has been investigated in animals by Bøe (1949)

Bøe injected B C G vaccine into guineapigs previously infected with tuberculosis The injections were made at various stages in the development of the tuberculous disease, including the pre allergic period He was unable to show that the vaccine had any harmful effect when given in the pre allergic period or while the tuberculous process was still moderate

At the worst, failure to segregate merely nullifies the effect of the vaccine

RESULTS OF VACCINATION

Mantoux conversion —At the present time the results of 317 vaccinations are known and the Mantoux conversion rate is shown in table VII The 100% conversion rate with vaccine A is, of course, extremely satisfactory, and the over all rate of 97 2% compares very favourably with the results reported by other workers No immediate reactions of the type associated with previous infection were observed

Table VIII sets out the size of the papule produced, and the extent of the tuberculin reaction after vaccination We endeavoured to record the results uniformly, and only those results which were read at approximately the eighth week after vaccination are presented Through circumstances beyond our control we were unable to test 111 individuals at this time (It should be remembered when comparing these results that the dose of

TABLE IX —SIZE OF PAPULE AND CORRESPONDING CUTANEOUS SENSITIVITY TO TUBERCULIN AFTER VACCINATION

Vaccine	Diam of papule (mm)	No in group	Amount of tuberculin (mg)	Diam of induration 5–9 mm. (Mantoux)		Diam of induration 10–19 mm (Mantoux)		Diam of induration 20 mm and over (Mantoux)	
				No	% of no in group	No	% of no in group	No	% of no in group
A	Less than 5	Nil	—	*Nil*	—	*Nil*	—	*Nil*	—
	5–9	40	0 1	17	42 5	21	52 5	2	(5·0)
	10–19	46	0 1	12	26 1	32	69 6	2	(4 3)
B	Less than 5	37	1 0	24	64 8	8	21 6	5	13 6

vaccine B contained twice the weight of organisms contained in the corresponding dose of vaccine A)

Size of papule and extent of allergy —From table VIII it will be seen that the average diameter of the papule produced by vaccine B was only 78% of that produced by vaccine A when one injection was made When the dose of vaccine A was split into two equal portions of 0 05 ml., the average diameter of the combined papule sizes was 64% greater than that of the average papule produced by a single injection of 0 1 ml. of the same vaccine Nevertheless, the average size of tuberculin reaction which developed was only 10% greater when the two injections were made Heimbeck, of Oslo, has recommended the administration of the vaccine by splitting the dose into three intracutaneous injections, 1 in apart, but he does so from another point of view—to minimise the risk of abscesses (a risk which has not arisen in our experience) The giving of two (or three) intracutaneous injections has the disadvantage that a longer time is required to carry out the vaccination

The size of the papule appears to be important from other points of view Hertzberg (1949), reviewing the results of vaccination by the Oslo Health Service in the period 1932–46, concludes that the size of the local reaction to B C G influences the frequency of tuberculin conversion, the degree of cutaneous tuberculin sensitivity, the duration of allergy after vaccination, and the resistance to tuberculous disease We have analysed our immediate results from the point of view of the frequency of conversion and the degree of cutaneous tuberculin sensitivity produced as estimated by the size of the tuberculin reaction

It is noteworthy that the average diameter of the papules in the subjects in whom Mantoux conversion did not take place was 3 7 mm (2–5 mm) Hertzberg (1949) found that, among 1190 cases in which the local reaction had been recorded as 4 mm or less, the Mantoux conversion rate was 56 4% compared with 95–100% in cases where the local reaction exceeded 5 mm in diameter

The relation between the size of papule and tuberculin sensitivity after vaccination is shown in table IX Hertzberg concluded that there was a tendency for the local reaction (after B C G) to vary directly with the tuberculin sensitivity, but that in each grade of papule all grades of tuberculin sensitivity were found The results shown in table IX are in keeping with Hertzberg's observations

The papules produced by the two vaccines developed at different rates, and this table shows very clearly the smaller size of papule produced by vaccine B At four weeks the papules produced by vaccine B were smaller, flatter, and showed less vesiculation and pustulation than the more active lesions produced by vaccine A At eight weeks the papules produced by vaccine B were comparable in appearance with those seen at four weeks in persons vaccinated with vaccine A At this time the latter papules were beginning to regress, but many still showed a vigorous reaction

It is extremely difficult to compare the degree of tuberculin allergy produced by the two vaccines (see table VIII) Preliminary testing indicated that cutaneous sensitivity was less with vaccine B than with vaccine A On the assumption that 0 1 mg of tuberculin would not discover all the conversions caused by vaccine B, a dose of 1 mg was employed in the majority of this group

In the small group (12) tested with 0 1 mg , and therefore comparable to those vaccinated with vaccine A, tuberculin allergy was slightly less In the large group (105) tested with a tuberculin dilution ten times as strong, the average size of the reaction produced by vaccine B was 42% greater

Development of allergy —It is usually agreed that tuberculin allergy develops between twenty-eight and forty-two days after entry of the tubercle bacillus into the tissues Yet of 94 students observed by us on the thirty-ninth day after vaccination, only 50 (53 2%) were Mantoux positive A further test of the negative reactors on the seventieth day showed that the percentage of positive reactors in the whole group had risen to 95 8

On account of the difficulty of inspecting the papules at short intervals it was impossible to observe accurately the rate at which they developed The statements of 108 people who were questioned indicated that the papules appeared between five and fourteen days after vaccination, and in the majority of cases after the tenth to twelfth day

COMPLICATIONS

No major complications were observed in the 317 vaccinations performed We noted that sometimes, when the papules were succeeded by vesicles or pustules, these broke down and discharged , but in all these cases careful cleansing and the application of a dry dressing prevented sepsis, and there were no instances of persistent ulceration In a few cases there was transient axillary discomfort, but in only 1 palpable glandular enlargement , in none did an abscess form The vaccine in fact appeared to be innocuous

SUMMARY

The organisation of a scheme for tuberculin testing and B C G vaccination of certain groups of students and hospital nurses in Edinburgh is described

Of the 1350 nurses and 1302 students tuberculin tested, 17 4% in each group failed to react to 1 mg of old tuberculin The different rates of Mantoux conversion in nurses and in students are described

Of the complete series of 2652 people, 462 failed to react to 1 mg of old tuberculin Of these, 429 (92 9%) were vaccinated with B C G intracutaneously , and the immediate results of 317 vaccinations are described Two vaccines were used, one containing twice the weight of bacilli contained in the other

Observations are recorded regarding the size of papule produced by vaccination and its relationship to subsequent allergy, as estimated by the size of the tuberculin reaction The Mantoux reaction after successful vaccination differs in some respects from that which follows natural infection

Vaccination has given rise to no serious complications.

This work was planned by Prof Charles Cameron We are indebted to him for criticism and help in preparing this paper, and to Dr Ian Macgregor, of the Department of Health for Scotland, for his sustained interest in the work and for advice regarding formulation of some of the tables

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The Second Quarter

The following figures for England and Wales in the quarter ended June 30 have been reported by the Registrar-General [1]

Births —The number registered was 181,784 representing a birth rate of 16 7 per 1000 total population The rate in the corresponding quarter of 1949 was 17 6

Stillbirths —These represented 22 5 per 1000 total births—0 4 less than in the second quarter of 1949

Deaths —The death rate was 11 1 per 1000 total population compared with 11 0 in the corresponding quarter of 1949 The infant-mortality rate was 28 per 1000 related live births—the lowest recorded for any second quarter

1 The Registrar General s Quarterly Return for England and Wales Births Deaths and Marriages Infectious Diseases Weather Survey of Sickness Population Estimates for the Quarter ended June 30 1950 H.M. Stationery Office Pp 30 1s

Poliomyelitis

In England and Wales notifications of poliomyelitis a the week ended Oct 28 were paralytic 182 (197), ion-paralytic 71 (81), total 253 (278) The figures for he previous week are in parentheses Notifications for he corresponding week in 1947 and 1949 totalled 280 .nd 307 Total uncorrected notifications for 1950 up to ind including the week under review are 7543 The :orresponding figures for 1947, 1948, and 1949 were 8022, .975 and 5259 A gradual reduction in notifications has iow been maintained for several weeks

Dr Newsholme's Retirement

Dr H P Newsholme, who in 1928 succeeded Sir John Robertson as medical officer of health for Birmingham, retired this year Formerly Birmingham had an unenviable notoriety, but in Robertson's time it gained a first-class public health service which Dr Newsholme carried on with outstanding success The school medical service had grown up independently of the public health service, and collaboration of these two services, without fusion, was the most notable achievement of Dr Newsholme's period of office

Dr Newsholme's contributions to public health theory have been mainly philosophical, but his factual annual reports, with only necessary commentary, have a permanent place in public-health history His last report—that for 1940—reveals a better state of health in the city than ever before For the first year on record no child died of diphtheria Pulmonary tuberculosis showed a slight increase in notification but a reduction in fatality Maternal mortality was 0 39, or, including deaths from abortion, 0 49, per 1000 live and still births, and there were no deaths from sepsis Infant mortality gave a new low record of 31 per 1000 related live births For years the Birmingham rate of infant mortality has been below that for England and Wales, this is a great tribute to local endeavour, for circumstances in this city are not favourable for a low rate

Infectious Diseases in England and Wales

Disease	Week ended								
	Sept					Oct			
	2	9	16	23	30	7	14	21	28*
Diphtheria	51	44	37	38	50	40	40	42	40
Dysentery	157	205	213	170	187	187	180	169	241
Encephalitis									
Infective	5	6	7	5	6	3	2	3	5
Postinfectious		2	5		2	1			4
Food poisoning	160	274	180	208	208	416	214	138	160
Measles excluding rubella	3413	2531	2498	2673	2963	3914	5009	5879	6632
Meningococcal infection	33	24	28	22	25	30	28	31	32
Ophthalmia neonatorum	36	32	52	37	44	32	45	37	27
Paratyphoid fever	6	11	11	9	11	11	8	13	14
Pneumonia primary or influenzal	235	192	220	260	283	351	382	432	435
Poliomyelitis									
Paralytic	302	328	292	268	222	241	223	197	182
Non paralytic	189	186	187	151	109	112	85	81	71
Puerperal pyrexia and fever	68	54	87	72	88	74	91	72	78
Scarlet fever	715	658	750	771	938	1064	1193	1228	1141
Smallpox									
Typhoid fever	7	6	8	3	7	10	7	3	6
Whooping cough	3671	3682	3090	2935	2618	2446	2461	2674	3077

* Not including late returns

Special Articles

REGISTRAR ESTABLISHMENTS

MINISTRY OF HEALTH STATEMENT

AN important announcement on the future establishment of senior registrars and registrars in England and Wales has been made by the Ministry of Health in a circular to hospital authorities The circular (R.H.B [50] 106) is summarised below

1 It has from the outset been made clear that the senior registrar and registrar grades are regarded as training grades for potential consultants (or senior hospital medical or dental officers) It follows that the total number of appointments, particularly in the senior registrar grade, should be closely related to the likely number of openings

2 It has also been indicated that training should be continued only for those who appear likely to benefit from it, and in particular that promotion from one grade to another should be competitive The base of the training ladder should be the first year in the registrar grade—a grade which should normally be reached at least 2 years after qualification The registrar should be reviewed at the end of the first year, and if satisfactory should normally proceed to a second year in this grade Those wishing to proceed further should seek an appointment in open competition as senior registrar, the number of posts available being considerably less than the number of second year registrar posts The senior registrar should also be reviewed at the end of the first and second years At the end of the third year in a senior registrarship training should be complete, appointment for a fourth year should be very exceptional, and for the most part confined to certain specialties such as thoracic surgery neurosurgery, and plastic surgery or to doctors who, having completed training as, for example, general physicians, wish to take up other specialties

LIKELY NUMBER OF VACANCIES

3 For some years to come the number of appointments open to senior registrars who complete their training at hospitals in England and Wales is unlikely to exceed 150 per annum This includes, not only consultant and senior hospital medical or dental officer appointments to make good wastage through death or retirement, but also a proportion of additional posts and openings in other services and overseas as well as in hospitals in this country Thus it appears that the number of training posts should not at present exceed the following senior registrar, 600, registrar, 1100 The figure for registrars is a total for those in the first and second years of training, and that for senior registrars the total for those in the first, second, and third years

4 At present the number in each of these two grades is upwards of 1400 "It is therefore essential to take steps to bring the number of training posts as quickly as possible into line with the numbers required"

5 The objectives should be

(a) To fix for each hospital regional area an establishment of training posts properly distributed between the different specialties and situated in hospitals with suitable facilities

(b) To reduce the present numbers by (i) making appointments only up to the new establishment figures, and (ii) discontinuing appointments of senior registrars now in their third or subsequent years as the present year of appointment ends (See also para 2 and para 9 (ii))

(c) If necessary, to make alternative appointments for carrying out the work of the hospitals

FIXING AN ESTABLISHMENT

6 Each regional board and the related board or boards of governors are asked to consider urgently together what trainee posts should be provided in the area within the maxima indicated below, and to submit their joint proposals by Jan 31, 1951 In preparing these proposals, the coöperation of the dean or director of postgraduate medical studies of the university should be sought The proposals should indicate the number of senior registrar and registrar posts proposed for each specialty and the hospitals where these posts are to be held The Minister will review these proposals as a whole, with particular reference to the distribution between specialties which can be satisfactorily determined only on a national basis

7 It appears that the maximum total number of posts for each regional area (including teaching hospitals) should be

Region	Senior registrar (total for first second and third year)	Registrar (total for first and second year)
Newcastle	34	63
Leeds	36	65
Sheffield	42	76
East Anglia	18	32
North West Metropolitan	75	138
North East Metropolitan	48	86
South East Metropolitan	52	96
South West Metropolitan	83	151
Oxford	22	42
South Western	30	56
Wales	28	51
Birmingham	52	96
Manchester	52	96
Liverpool	28	52

The distribution between specialties will vary from region to region according to the training facilities, and the concentration of teaching resources in London will have to be taken into account

REDUCTION IN NUMBERS

8 In addition to fixing total establishments, an approximate distribution in each region of the total into numbers for each year of training must obviously be made, though this may vary slightly at different times When the distribution of posts by specialty and hospital has been determined, it will be necessary to decide which of the existing first year registrars or first-year or second-year senior registrars can continue for a further year, and where new appointments in the first year of each grade can be made during the coming year Regional proposals should therefore include a statement of the number of registrars and senior registrars by specialty in each year of training it is proposed to retain or recruit during the coming year

9 When the establishment proposals have been approved by the Minister, these should be strictly adhered to This means that

(i) The number of first-year registrars or senior registrars recruited during the year should be the number (within the approved total) which boards have decided is appropriate

(ii) As the existing second year registrars and third year senior registrars reach the end of their personal year of appointment, their appointments should be terminated (except in the exceptional circumstances mentioned in paragraph 2), and first-year registrars and first-year and second year senior registrars should be reviewed and reappointed for a further year s training only so far as this is possible within the approved total establishment

10 From now on, boards should not renew the appointment of any second year registrar whose personal year of appointment ends, or of any third (or subsequent) year senior registrar except in the exceptional cases mentioned at the end of paragraph 2 or in accordance with the terms of paragraph 11 (a)

ALTERNATIVE APPOINTMENTS

11 Where a board is satisfied that the work of the hospital necessitates an alternative appointment in place of a *senior* registrar (but not otherwise), the following are among the steps that may be taken

(a) An existing senior registrar whose appointment as a trainee is not renewed may be offered an appointment for one year only as a temporary senior registrar at his present salary rate

(b) Alternatively, boards may appoint as part time clinical assistant a suitably experienced general practitioner (normally one with a higher qualification and experience as a senior registrar or registrar) Remuneration will be announced later

JUNIOR REGISTRARS

13 In future "junior registrars" will be known as "senior house officers," since this is not regarded as a trainee grade like that of registrar

OTHER OPENINGS

An appendix draws attention to the openings outside the National Health Service First, the three Armed Forces need 400 specialists, notably in the following specialties anæsthetics, surgery, otology, radiology, psychiatry, pathology, dermatology, and venereology In addition there are over 100 vacancies for general duty officers Secondly, in the Colonial Service about 200 permanent or temporary posts are available Thirdly, a number of overseas university and hospital appointments are vacant or will shortly be vacant principally in the Middle East and South East Asia, further information about posts in this third group may be had from the Technical and Scientific Register, York House Kingsway, London, W C 2

Parliament

Vivisection and Cancer Research

ON the motion for the adjournment in the House of Commons on Oct 31, Mr PETER FREEMAN doubted whether experimentation on living animals was of real value in the search for a cure for cancer In 1904 there were 8292 such experiments, and in 1949 they numbered 75,343 About two thirds of these were conducted without any anæsthetic for the animals concerned. About 80% of the animals were allowed to recover and could be experimented upon again The total number of experiments during the last half century had exceeded 1,300,000 Yet in 1900 deaths from cancer were 26,721, and last year they were 80,732 As possible causes which might be investigated, in preference to continued experiments on animals, he mentioned the stress of modern industrial life, the increased consumption of alcohol, tobacco, narcotics, animal and artificial foods, pasteurised milk, and patent medicines, and the modern craze for injections, serums, inoculations, and vaccinations. He had no doubt that there would be an overwhelming response to any request for men and women prepared to submit to reasonable experiment

Dr CHARLES HILL declared that to assert that animal experimentation was futile was to fly in the face of facts An enormous amount has been achieved, and at least one form of cancer was now curable as a result of animal experimentation Dr Hill preferred to see animals rather than human beings used for attempts to induce cancerous growths

Mr GEOFFREY DE FREITAS, under-secretary of State for the Home Department, in reply drew the attention of the House to the stringency of the safeguards under which these experiments were permitted No animal experiment was permitted without a licence from the Home Secretary, and all were subject to inspection A further special certificate was required when the animal lived after the experiment The Home Office inspectors who advised the Home Secretary on the granting of these certificates did so on the basis of wide knowledge of the applicants' experience and of the suitability of the place of experiment Most of the animals used were small rodents, chiefly mice, but occasionally rats or guineapigs In the last two years there had been 24 experiments on cats and 28 on dogs The most usual experiment was when a substance such as coal tar was applied to a small part of the skin of the mouse or a small amount was added to the animal s diet Each application counted as one experiment, and the large figures quoted related to experiments and not to animals Mr de Freitas pointed out that the death rate from cancer had remained fairly constant for the last thirty years and there had been a slight reduction each year in the mortality of women The Medical Research Council held views on the value of animal experiments in cancer research which were directly contrary to those of Mr Freeman In a recent report the council said

> "There seems to be general agreement that most of the advances which have been made recently in our knowledge of the causation and treatment of various forms of cancer would have been impossible without experimental work on animals Indeed there is no form of medical research which has been more dependent on animal work Substances to which human beings may be exposed can be tested in animals for their tumour producing properties This research has made possible the protection of many thousands of industrial workers"

A close control of these experiments was exercised by the Home Secretary and he asked the House to agree that this control was most carefully administered

In England Now

A Running Commentary by Peripatetic Correspondents

THERE was consternation in our chest clinic the other morning as a result of the only passably useful piece of clinical research I have yet undertaken.

A trombone player in a world-famous orchestra had recently been discharged from the local sanatorium with a left artificial pneumothorax and he wanted to know whether he could safely give of his best work once more. Here was our chance By careful staff work his formidable instrument was smuggled into the screening-room, whence in due course emerged the restrained trombone passages from the first movement of the Great C Major Symphony, though in our small clinic, noisy enough at best, this did not sound so restrained. Even after several bars, however, the expansion in his lung was less than half that produced by a quiet cough. We then transferred him to the refill-room to confirm this finding and obtained these eminently satisfactory readings on the manometer

Activity	*Intrapleural pressure (cm of water)*
Quiet respiration	−10 −7
Sustained conversation	−2
Trombone parts from	
Symphony in C Major Schubert	−5 rising to −10
Prelude to act 3 of Lohengrin Wagner	−10 to −12
Coda to Symphony No 2 Sibelius	−16 (maximum)
Quiet cough	−45 to −60
Loud cough	Too high to be read on our manometer

By this time the refill queue was getting restless and voices could be heard raised in anger The trombonist explained that the average blowing time for a concert was 16 minutes and the average weekly total including rehearsals not more than 2½ hours In view of the experimental findings I assured him that it would be perfectly safe to continue with his present work

* * *

I was staying at the Bear Inn at Hungerford when I read in the papers about Princess Elizabeth s dress. When the Court went into mourning for King Gustav the Princess had no suitable black dress to wear at the Royal Command Film Performance that night The Queen s dressmaker had his whole staff working on the job all day they rushed the finished dress to Clarence House by 7 P.M., and everyone thought how nice she looked in it at 8 o clock when the film show began. A triumph of modern organisation? I agree but there have been triumphs of the sort before. In the hall of the Bear Inn, for instance hangs the story of how the Throckmorton Coat was made at Newbury in 1811 Sir John Throckmorton bet he could get a coat made from the raw materials in one day Some chump took him on, though everyone knows that people who make such outlandish bets always win and Throckmorton produced two sheep These were shorn at 5 A.M., the wool was washed and spun on the spot, sent to the local weavers to be dyed dried, and woven and by 4 o clock the cloth was ready for the local tailors, who removed their coats and finished Sir John s at a canter by 7 30 P.M. The main scenes in this drama are illustrated in comic-strip form above the document.

* * *

Women doctors, even if not so named, were part of our national life several hundred years ago, if we are to believe John Aubrey s *Lives*, written between 1669 and 1696, which have lately been republished [1] This discovery gave me a pleasant feeling of continuity with my maternal ancestresses who sprang from the same part of Wiltshire as Aubrey himself. Speaking of his grandfather s days, not long before the dissolution of the monasteries, Aubrey says, ' The young mayds were brought up at the nunneries where they had examples of piety and humility and modesty and obedience to imitate and to practise Here they learned needlework, the art of confectionery, surgery (anciently no apothecaries or surgeons—the gentlewoemen did cure their poore neighbours their hands are now too fine), physick, writing, drawing This was a fine way of breeding young woemen, who are led more by example than precept." The curriculum is fuller now, though unfortunately the art of confectionery has been dropped needlework is still useful, as a great surgeon remarked when he watched some of us women practise suturing the gut Writing, by which Aubrey no doubt meant calligraphy, is badly neglected and many of us even boast that we write illegibly but drawing, or at any rate draughtsmanship, is still encouraged in the preclinical course The modern teaching hospital is no nunnery, but there are plenty of examples of piety, humility, modesty and obedience to be found there if we look about, and a medical or nursing training is still a fine way of breeding young women.

* * *

O surgeons, lay the lancet lay the bistoury aside,
Unloose the gory gown and leave the mystic mask untied
Forswear the silver catheter, your stitches all uncast,
Do not prescribe the cephalotribe, unhand the craniocast
The silence of your theatres be unwilling to profane—
I sing of the phlebotomist whose work was not in vein

Now likewise ye physicians your patients have enough
Of drench and diuretic of purges *quantum suff*
Dispense with all your nostrums, break bottles, burn the corks
Palpate not glands with furtive hands, sound not your tuning forks.
Go, load em up with laudanum to still their cries of pain
'Tis the phlebotomist I sing, whose life knew neither snare nor sting
Except for one sad silly thing—his work was not in vein

He sought the early writers, of whom his craft was born
They cited him the pelican, they spake of unicorn,
They *threwe a goldene blood-soulere to the bo'me of a pille* [1]
He fled the older workers' fold and looked up *Whit and Brit*
Dissatisfied, he tried and tried, and wrought with might and main
Until, at last you see him plough no more the gory furrow now
Arma virumque Arms enow are finely bled, his colleagues vow
I sing a man, you will allow, whose work is *not* in vain.

* * *

It is always comforting to find someone else with one s own complaint I was wondering the other day, as I crossed the street in our market town, whether I was paranoiac, for every motorist and cyclist seemed intent on running me down directly I stepped off the pavement A few days later the *Times* published a letter from a man who shared my feelings exactly He also had the reverse impression when driving (? incipient megalomania)—that all pedestrians are suicidal nitwits. To me they appear more like sleep-walkers, gliding with glazed unseeing eyes in front of my bonnet when they should be at home in bed (where they soon will be if they are not more careful) But perhaps after all these ideas are not symptoms of a deranged mind.

* * *

The M.B. finals being depressingly near, I peripated for a week or so in South Wales. On the lower slopes of the Brecon Beacons I stopped to talk to an elderly hedger He was soon telling me how he had T B in his youth and while waiting for a bed tried taking sheep dip (They call it non-poisonous, though there s poison in it ') but the phlegm was still gaining on him, so he took half a sheep s fluke pill That cured him. He hadn t told any doctors because they might put him in prison. I hope they won t

1. Brief Lives Edited by Anthony Powell. Cresset Press. London, 1949

1 Trevisa J de Transl. *Polychronicon Ranulphi Higden Monachi Cestrensis* 1387

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ON the motion for the adjournment in the House of Commons on Oct 31, Mr PETER FREEMAN doubted whether experimentation on living animals was of real value in the search for a cure for cancer In 1904 there were 8292 such experiments, and in 1949 they numbered 75,343 About two thirds of these were conducted without any anæsthetic for the animals concerned. About 80% of the animals were allowed to recover and could be experimented upon again The total number of experiments during the last half century had exceeded 1,300,000 Yet in 1900 deaths from cancer were 20,721, and last year they were 80,732 As possible causes which might be investigated, in preference to continued experiments on animals, he mentioned the stress of modern industrial life, the increased consumption of alcohol, tobacco, narcotics, animal and artificial foods, pasteurised milk, and patent medicines, and the modern craze for injections, serums, inoculations, and vaccinations He had no doubt that there would be an overwhelming response to any request for men and women prepared to submit to reasonable experiment

Dr CHARLES HILL declared that to assert that animal experimentation was futile was to fly in the face of facts. An enormous amount has been achieved, and at least one form of cancer was now curable as a result of animal experimentation. Dr Hill preferred to see animals rather than human beings used for attempts to induce cancerous growths

Mr GEOFFREY DE FREITAS, under-secretary of State for the Home Department, in reply drew the attention of the House to the stringency of the safeguards under which these experiments were permitted No animal experiment was permitted without a licence from the Home Secretary, and all were subject to inspection A further special certificate was required when the animal lived after the experiment The Home Office inspectors who advised the Home Secretary on the granting of these certificates did so on the basis of wide knowledge of the applicants' experience and of the suitability of the place of experiment Most of the animals used were small rodents chiefly mice, but occasionally rats or guineapigs In the last two years there had been 24 experiments on cats and 28 on dogs The most usual experiment was when a substance such as coal tar was applied to a small part of the skin of the mouse or a small amount was added to the animal s diet Each application counted as one experiment, and the large figures quoted related to experiments and not to animals Mr de Freitas pointed out that the death rate from cancer had remained fairly constant for the last thirty years and there had been a slight reduction each year in the mortality of women. The Medical Research Council held views on the value of animal experiments in cancer research which were directly contrary to those of Mr Freeman In a recent report the council said

> 'There seems to be general agreement that most of the advances which have been made recently in our knowledge of the causation and treatment of various forms of cancer would have been impossible without experimental work on animals Indeed there is no form of medical research which has been more dependent on animal work Substances to which human beings may be exposed can be tested in animals for their tumour producing properties This research has made possible the protection of many thousands of industrial workers

A close control of these experiments was exercised by the Home Secretary and he asked the House to agree that this control was most carefully administered

The size and administrative structure of the whole or parts of the organisation should be such as to engage the loyalty of all those concerned in the enterprise

Opportunity should be given for the development of individuality in the parts of the organisation

Power in the organisation should not be given to those whose loyalty is centred in a conflicting organisation

The conditions should provide for personal contacts between the workers in the organisation at different levels Medical administrators should not be allowed to lose the medical touch by remoteness from people as patients

The conditions should encourage the exercise of the better ethical qualities Interest in making money or careerism should not be rewarded and stimulated to the detriment of interest in medicine and humanism.

In making appointments to the staff, qualities other than mere technical qualification should be given full consideration

There should be general agreement on the basic aims of the organisation so that actual direction will be reduced to a minimum and the recurring problem will be the definition of the situation

Self-criticism in members of the organisation should be stimulated by the knowledge that their behaviour is manifest to colleagues who are competent to judge it

Walton Hospital,
Liverpool. HENRY H MACWILLIAM

LIQUOR AMNII IN HÆMOLYTIC DISEASE OF THE NEWBORN

SIR,—Mr Bevis's interesting observation (Sept 30), that in hæmolytic disease of the newborn the liquor amnii may contain iron, prompts us to record some investigations into the significance of coloured liquor amnii, recently made with the help of our obstetric colleagues at this hospital.

Starting from the fact that in hæmolytic disease the liquor is often coloured yellow, we have tested the liquor in six cases of this disease, with the following results In two cases liquor, taken 1–3 days before parturition at 36 and 40 weeks, was colourless and bilirubin free, in both cases the infant proved not severely affected In three cases, tested at 34–35 weeks, the liquor was yellow with a trace, 0 9 and 1 2 mg per 100 ml. of bilirubin, all three proved to be cases of hydrops fœtalis with death at or shortly after birth In the sixth case liquor was taken at 41 weeks, 2 days after intra uterine death had taken place, this liquor was dark green and had a bilirubin content of 8 mg per 100 ml From these few figures it appears that coloured bilirubin-containing liquor tends to be associated with severe forms of the disease

However, coloured liquor is sometimes found in normals The liquor from fifty nine subjects not involving hæmolytic disease was tested, and in six the colour was yellow or green. In three of these six the bilirubin content was between 0 5 and 1 2 mg per ml, in the other three the pigment unexpectedly failed to react with van den Bergh reagents

In order to discover whether meconium staining could account for the coloration of liquors, we made up suspensions of meconium in a colourless sample of liquor A 1 25% suspension of meconium gave a liquid with a green tint comparable to those seen clinically, and proved to have a bilirubin content of 1 6 mg per 100 ml—i.e, of the same order as that found in our clinical material. It seems that meconium staining is the probable cause of the coloured liquor occasionally seen in normals It is surprising that some of these coloured liquors have failed to react with van den Bergh reagents, since biliverdin is said to be the main pigment in meconium and to give a similar diazo reaction to bilirubin

It may well be that the bilirubin which we have found in the liquor of severe cases of hæmolytic disease also comes from meconium, and that where hæmolysis is active in the fœtus, with bile pigments present in high concentration in the coloured by small amounts of bilirubin which would ordinarily be insufficient to do so Possibly the iron which Mr Bevis has found in the liquor in hæmolytic disease may also have come from the meconium

We had originally hoped that the bilirubin content of liquor might provide some guide to the degree of involvement of the fœtus by hæmolytic disease But from Mr Bevis's work it seems that the iron content is more likely to prove of use in this sense

Cambridge Maternity Hospital
Cambridge
DOUGLAS GAIRDNER
N R LAWRIE
MARY HUTCHEON

A C T H AND FATTY LIVER IN RABBITS

SIR,—In the course of investigations on the possible release of progestational material from the adrenals of A C T H treated rabbits, well-marked fatty infiltration of the liver was observed after administration of relatively small amounts of this substance In most cases the mobilisation of fat to the liver was accompanied by visible lipæmia

The animals were ovariectomised one month before the start of the experiments and were primed with 25 μg of œstradiol benzoate on each of 6 consecutive days The A C T.H preparation used was an electrophoretically purified homogeneous A C T.H.-protein,* administered on 5 subsequent days Liver fat was estimated histologically as sudanophil lipid, by the grading system of Hartman et al [1]

The results are summarised in table I When the experiments were repeated in normal female rabbits, the results, shown in table II, were essentially the same

TABLE I—FATTY INFILTRATION OF THE LIVER OF OVARIECTOMISED RABBITS PRIMED WITH ŒSTRADIOL BENZOATE, AFTER ADMINISTRATION OF PURE A C.T.H

Rabbit no	Weight (kg)	Daily dose A.C T.H (mg per kg)	Length of treatment (days)	Total dose A C T.H. (mg)	Fatty infiltration†
1	4 0				0
2	2 8				0
3	3 5				0
4	3 5	0 8	5	14·0	+ + + +
5	3 4		5	14 0	± + + + ±
6	3·0	0·65	1	2·0	+ + +
7	3 2		2	4·0	+ + +
8	3 3		5	10 0	+ ±
9	4 0	0 25	5	5·0	+ ± +
10	4 1		5	5·0	+

TABLE II—FATTY INFILTRATION OF THE LIVER OF NORMAL FEMALE RABBITS AFTER ADMINISTRATION OF PURE A.C T.H.

Rabbit no	Weight (kg)	Daily dose A.C.T.H. (mg per kg)	Length of treatment (days)	Total dose (mg)	Fatty infiltration†
11	3 5				0
12	2 9				0
13	2 5	1 2	5	15 0	± + + + −
14	3 5	0 8	5	14 0	+ + + + ±
15	3 1	0 65	5	10 0	+ + + + ± +
16	3 0		5	10·0	+ + +
17	4 1	0 25	5	5·0	± ± ±
18	3 7		5	5·0	+ ±

† According to the grading system of Hartman et al.[1]

These findings confirm the experiments on rats by Baker et al [2] and they agree with the results of Levin,[3] obtained in mice It is interesting that recently Kobernick and More [4] reported marked lipæmia in rabbits treated with 'Cortisone'

* Our thanks are due to Dr C H. Li who kindly supplied this preparation.

1 Hartman F A. Brownell, K. A. Knouff R A. *Endocrinology* 1947 41 213
2 Baker B L Ingle D J Li C H Evans H. M. *Amer J Anat* 1948 82 75
3 Levin, L *Fed Proc.* 1949, 8 218
4 Kobernick S D More R H. Proc Soc exp Biol N Y

Letters to the Editor

DISTINCTION AWARDS

SIR,—The letter from "A B C" in your last issue prompts me to write and explain how those who have a similar dislike for and reluctance to accept Distinction Awards can give the maximum benefit to any charitable object of their choice If they give a subscription out of their taxed income without covenanting to continue it for seven years that nett amount is the total received by the "charity", but if they enter into a covenant to give the same amount each year for seven years or during their lifetime (whichever period is the shorter) the income tax can be recovered by the charity in whose favour the covenant is drawn The benefit is thereby nearly doubled

I hope that many who may follow the example of "A B C" will feel inclined to support the Royal Medical Benevolent Fund Others may have other objects foremost in their minds—such as the Royal Medical Foundation of Epsom College, their own schools or universities, the restoration fund of the Royal College of Surgeons, the extension of the Royal Society of Medicine—or they may wish to divide their gifts between two or more objects The officers of any of these institutions will be anxious to provide prospective donors with the appropriate forms of covenant

WEBB JOHNSON
President, Royal Medical Benevolent Fund

1, Balliol House Manor Fields
London S W 15

DANGER OF HEXAMETHONIUM IODIDE

SIR,—During the last eight months while using methonium halides, and hexamethonium iodide in particular, on more than one occasion we have observed a marked fall in systolic blood-pressure in robust men These patients initially had a normal blood pressure, and the state of circulatory collapse which resulted was an incidental finding to our clinical researches

We feel that the dangers accompanying the use of these substances in domiciliary practice should be stressed, and also that insufficient publicity has been given to the use of ephedrine hydrochloride as an antidote We have confirmed the finding of others, that ephedrine hydrochloride administered intramuscularly in a dose of 1–2 grains will rapidly raise the systolic pressure again

B R HILLIS
JOHN C C KELLY

University Medical Clinic,
Stobhill Hospital, Glasgow

MASS MINIATURE RADIOGRAPHY

SIR,—Last August I was visited by a doctor from Victoria, Australia In his opinion, mass miniature radiography would be much more successful in this country if the volunteers were not made to undress for the examination I was impressed with the idea and proceeded cautiously to ascertain the correct technique for X raying volunteers without their undressing fully

Our results up till now are very striking The miniature X-ray films are of a very high quality and are certainly not inferior to those taken in the ordinary way Women are asked to remove overcoats and coats, necklaces, and metal objects or ornaments, such as brooches, from their blouses Men remove their jackets and waistcoats, and slip their braces down to the waist In the case of women, the X ray films show small metallic buckles and fasteners or clips associated with brassieres, but as a rule these are readily recognised as such and are situated in places where they do not interfere with the reading of the miniature film

The great advantage is that men and women can be X-rayed at the same sessions This is most beneficial, especially at public or "open" sessions, and at contact sessions, when whole families can be X rayed, one after another At the moment all male members are invited to attend on one day, and the female members on another When the whole family can attend at the same time, the response is likely to be very much better Moreover, much time is saved

A E BEYNON
Medical Director

Chest Radiography Centre,
Nottingham

HOSPITAL ADMINISTRATION

SIR,—I think your correspondent (Sept 30, p 450) rather underrates the amount of thought that has been given to administration since the days of Florence Nightingale

Hospital administration is merely a part of health service administration, which is itself a special field of human relations Principles may be selected at various levels Those which your correspondent has chosen apply purely at hospital level, but I think that consideration of more general principles might be beneficial to the service

In his Linacre lecture Dr F M R Walshe[1] quoted from R J Collingwood's book *The Idea of Nature* as follows

> "A man who has never reflected upon the principles of his work has not achieved a grown up man's attitude to it A man who has never enjoyed a certain type of experience cannot reflect upon it"

All doctors in this country have had experience of voluntary teaching hospitals, their obligations and their methods of administration, but only a limited number have had, in addition, experience of local authority hospitals The tendency of the Ministry of Health to follow the voluntary hospital pattern may possibly be due to the fact that those whose reflections have influenced the Ministry have had only limited experience

I suggest as principles the following from my own observations

The purpose, scope, and range of the activity should be clearly enunciated

The duties and obligations of voluntary hospitals were different from those of local authority hospitals, and the functions of hospitals in a complete coördinated health service are different from either

The organisation should be for human beings in their complete social environment

People should be regarded as free individuals and not as abstractions, such as masses of clinical material

Primary aims should be kept clearly in view, and secondary aims such as, for example, medical education should not be allowed to take first place

The administration should be for the whole of the activity, and the tendency of specialists to organise for parts of people or for narrow sections of the population should be corrected and checked or supplemented

The limitations of technicians—clerical, financial, architectural, engineering, medical, and so on—should be admitted and the interests of the consumer for whom the organisation primarily exists be safeguarded

Responsibility should be clearly defined

Power should not be given without responsibility

Power and responsibility should be placed close together and in proportion to each other They should be placed close to the point of activity

Power should not be remote and anonymous The sense of responsibility should not be weakened by the evasions possible in committee control or by diffusion over too wide a field

The consequences of decisions should be demonstrated to the person making the decisions

Duties and responsibilities should be placed in appropriate hands—medical administration should be vested in doctors, clerical in secretaries, financial in accountants, and so forth

1 Humanism History, and Natural Science in Medicine Edinburgh 1950

Obituary

ERNEST GORDON GRAHAM-LITTLE

KT, B A CAPETOWN, M D LOND, F R C P

Sir Ernest Graham-Little had a long record of distinguished public service as member of Parliament, university senator, and consulting dermatologist He was born, in 1867, in Bengal, where his father, Michael Little, J P, held a position in the Civil Service His mother was a South African and he was educated at the South African College, Cape Town. A gold medallist and a Porter scholar, he took his B A. in 1887 at Cape University before he came to this country to study medicine at Guy's Hospital and St George's Hospital He qualified in 1892, and he graduated M B with honours in 1893 After postgraduate study in Dublin and Paris he took his M D the following year and the membership of the Royal College of Physicians in 1895 He quickly won recognition as a dermatologist, and he was already on the staff of the East London Hospital for Children at Shadwell when he succeeded Sir Malcolm Morris as physician in charge of the skin department at St Mary's in 1902 He also held a university lectureship there, and he was thus a teacher in dermatology in the vintage period of Galloway, Burnett, Sequeira, Whitfield, and Adamson In 1906 he was elected F R.C.P

[Press Portrait Bureau

He maintained his interest in pathology and he carried over to his specialty his skill with the microscope His contacts with other dermatologists were wide At one time president of the dermatological section of the Royal Society of Medicine, and editor of the section of skin diseases in the *Medical Annual*, he was also in touch with the dermatological societies of over a dozen foreign countries, and he was honorary president of the ninth international dermatological congress held in Budapest in 1935

But this side of his career was gradually overshadowed by his work for the University of London and as a member of Parliament For over 40 years he represented the medical graduates of London University in the senate, where he stoutly resisted the attempt to fasten on the university an official coöperation in its final M B, B S examination with the Conjoint Board At a time when women had limited opportunities for clinical education in London he secured the recognition of the West London Hospital as an institution where they might be admitted as external students But his services to the university did not rest with his membership of the senate He was also chairman of the external council and president of the University of London Graduates' Association, and in 1924 he was elected to Parliament as university representative

This seat he continued to hold until the university franchise was discontinued He sat, appropriately enough as an Independent, for he was a convinced and often effective controversialist In the House of Commons he was an alert guardian of the interests of the medical profession, and he consistently resisted any concession to unqualified medical practice He was a member of the parliamentary committees which sat on the Road Traffic Act, the Marriage Act, the Factories Act and the earlier Criminal Justice Bill which was one of the casualties of the war His criticisms of the National Health Service were sharp, but they were founded on principles sincerely held A colleague writes "Graham-Little had a flair for the political life, which he developed both in the University of London and in Parliament he had a genius for organising successful elections and he was a pamphleteer of persuasive and masterly skilfulness"

To these main activities he added a large range of subsidiary interests He was a member of the council of the British Chess Federation, the Footpaths Preservation Society, and the Society of Individualists, while wholemeal bread, the British Empire, and backward races were other subjects on which he contributed pungent letters to the editors of the daily press, the medical weeklies, and erudite periodicals

He married Miss Helen Kendall, who survives him Together they shared the tragic loss of their only daughter in a bathing accident, and of their only son on active service with the R.A.F V R Sir Ernest died on Oct 6 at his house at Epsom, where he had lived since his Wimpole Street house was destroyed by bombing

DOUGLAS STUART STEVENSON

M B E, M B GLASG, F.R F P S

Dr Douglas Stevenson, physician to the Western Infirmary, Glasgow, died on Oct 21 He was born and educated in Glasgow, and his mother was a sister of J H Teacher, who held the chair of pathology in the university During the 1914–18 war he served with small naval patrols till in 1917 he returned to graduate He at once joined the R.A.M C, and later the medical branch of the new Air Arm For his services he was appointed M B E and awarded the Belgian croix de-guerre He thus held commissions successively in all three Services, and in 1942, though no longer a young man, he characteristically abandoned private practice to act as consulting physician to Scottish command He took a keen interest in ex-Servicemen and their problems

"He graduated," writes J McN, "into pure consulting medicine, like many of his generation (but this is ended now), as a family physician He was in fact for years the trusted physician and adviser of many families round about Glasgow, who will not fail to remember his skill, courtesy, and friendship This initial phase made Stevenson, when he obtained his wards at the Western Infirmary, an ideal practising consultant physician He was never greatly interested in research, but rather in the care of his patients and also of the situation, domestic and otherwise, created by their illness Thus Stevenson was a splendid teacher of medical students intending to become general practitioners, and such men are becoming rarer every day" Dr Stevenson was an honorary lecturer in clinical medicine at the university

One of his former clinical assistants writes 'Stevenson was a very energetic practitioner-consultant with a remarkable flair for grasping the essentials of a clinical problem His teaching was lively and convincing and often illustrated from his experience in general practice As a consultant he developed a special interest in clinical hæmatology He had a passionate love of tradition, and those who knew him well could not fail to be impressed by his strong sense of duty Douglas loved the open air, and his remarkable memory—visual and auditory—enabled him to describe long excursions into the lonely places of the Highlands As a young man he played rugger, and he was a skilful yachtsman and a good shot"

GEORGE ALLISON ALLAN

M.D GLASG, F R C P, F R.F.P S

As a young man Dr Allan abandoned a business career to study medicine Graduating M B with honours in 1905, he took the Brunton prize as the most distinguished graduate of his year After 18 busy years in general practice in Glasgow, he turned his attention to consulting medicine with a special interest in cardiology Even at this stage of his life he retained his unusual intellectual flexibility, for he was awarded the Bella houston gold medal for his M.D thesis in 1924, nearly 20 years after taking his M B

Allan's principal appointment was that of visiting physician to the Western Infirmary, where he worked under a succession of distinguished clinicians, but his services were constantly in demand at half a dozen smaller institutions beyond the city He was a shrewd diagnostician and a most understanding doctor, and these qualities accounted for the rapid growth of his consulting practice in the West of Scotland As a physician in charge of wards he enjoyed a high reputation both as a chief and as a painstaking teacher, and he took

It is plausible to assume—as Archer [5] pointed out—that the same prompt mobilisation of fat to the liver may take place in man The promptness of the fatty infiltration of the liver following the administration of relatively small amounts of pure ACTH seems to warrant a careful search for similar effects in human beings

Department of Gynæcology
Karolinska Sjukhuset,
Stockholm

EGON DICZFALUSY
AXEL WESTMAN

"PER CAPITA"

SIR,—I am grieved to find that you too (Nov 4, p 498) appear to be among those who have fallen before the Medusa of the National Health Service, and that the Latin instilled into you as a schoolboy appears to have evaporated I had hoped that THE LANCET might remain immune from this proletarian disease

London W 1 DOUGLAS ROBERTSON

*** Our immunity to this particular error is now restored to a high level —ED L

LEPTOSPIRAL MENINGITIS

SIR,—The article by Dr Geffen and Dr Tinker (Aug 5), and Dr Calnan's letter (Sept 30), each referring to a single case of leptospiral meningitis in 1949 and 1950, suggested to us that a further note of our experience might be of value

The routine tests carried out on sera from all cases of aseptic meningitis, abortive poliomyelitis, or ? virus meningitis sent for investigation to the Virus Reference Laboratory, consist in complement fixation tests for the viruses of lymphocytic choriomeningitis and mumps and agglutination tests for leptospira The Paul Bunnell test was done for several years without positive results and is no longer carried out unless there is some other indication Of 130 patients studied in 1949, 10 were found by one of us (J. C B) to have serological evidence of leptospirosis (8 *L canicola* and 2 *L icterohæmorrhagiæ*), 5 cases were recent infections with the virus of lymphocytic choriomeningitis, and 2 were mumps meningitis (following about a week after fleeting parotitis) These results were recently presented (F O MacC) at the 6th International Congress of Pædiatrics Of 67 similar cases from Jan 1 to June 30, 1950, 3 have been found to be leptospirosis (2 *L canicola* and 1 *L icterohæmorrhagiæ*)

Virus Reference Laboratory
London N W 9

F O MACCALLUM

Wellcome Laboratories of Tropical
Medicine Euston Road London N W 1

J C BROOM

MEIGS'S SYNDROME

SIR,—Dr Macpherson suggests (Sept 30) that ascites and hydrothorax in Meigs's syndrome is caused by a similar mechanism to that in cirrhosis of the liver I believe that in cirrhosis and other hepatic abnormalities these phenomena may be due to the abnormal liver compressing the inferior vena cava

We have studied two cases which appear to substantiate this theory

In one case, where there was cirrhosis with a large liver, the venal caval obstruction developed gradually and after two years was complete, finally producing grossly abnormal collateral circulation That the site of obstruction was not at the opening of the diaphragm or in the adjoining pericardium was proved by exploratory operation

In the second case there was a large heavy liver, due to fatty degeneration and when first seen the patient had for three months been constantly orthopnœic, she had gross œdema of the lower abdomen and legs, ascites, and right hydrothorax. When she was made to lie flat in bed all œdema disappeared within a few weeks, and the body weight dropped from over 190 lb to 130 lb , the hydrothorax diminished more gradually During the next two months œdema could be produced by getting her to sit upright, day and night, for five days After six months' treatment with a high protein diet and choline the liver returned to normal size, and no œdema, ascites, or hydrothorax reappeared even while she was walking about, although her serum proteins remained at the initial low level

The concept of venal caval obstruction by the liver is not entirely new Bull [1] has published convincing evidence that in lordotic people it explains the existence of orthostatic albuminuria A large heavy liver is apt to rotate excessively when the patient stands, and it is remarkable that clinical disorder from increased venal caval pressure is not more common The caudate lobe, as seen at routine autopsies, is a very variable structure and sometimes appears to compress the vena cava when moderate traction is applied to the vena cava The predisposition to hydrothorax can be explained by the enormous engorgement of the azygos vein produced by venal caval obstruction, when this is combined with altered serum proteins there is reason to expect the appearance of hydrothorax

Dr Macpherson's post mortem findings in cirrhosis appear to accord with the theory of venous back pressure. The evidence of low grade infection may be just a terminal complication in a patient with a failing liver A more detailed analysis of his findings would help to eludicate the problem

I have never investigated the venous return in Meigs's syndrome and I fail to see how the presence of a small ovarian tumour could influence the above mechanism In most reported cases, however, there has been a fairly large pelvic tumour, and possibly there may be traction on the lower end of the vena cava Borg [2] reported a very dilated azygos vein at autopsy in a case of Meigs's syndrome, while Gardiner and Lloyd Hart [3] have collected other evidence that the mechanical obstruction of venous return in the abdomen was the most likely explanation

St Vincent's Hospital,
Dublin

D K O'DONOVAN

THE N H S THROUGH AMERICAN EYES

SIR,—I have noted with interest your very fair comment last week, but I feel that your comparison of annual expenditure on medical care in the U S A and this country may be somewhat misleading By converting American expenditure into pounds at the present rate of exchange, your editorial suggests that nearly three times as much is spent per person on the medical services in the States as over here The rate of exchange, however, is not a suitable basis for comparison and conversion The cost per person of the medical services in each country should be measured by the "sacrifices" which the individual has to make to secure them If an American typist earns $45 a week she will have to work for 7–8 days to provide the $70 which represents the annual average cost of medical care in the U S A Her British counterpart earning £5 15*s* a week will have to work for exactly the same period to provide the £9 which represents the annual average cost of medical care here

If wages and prices are studied on this economic basis, the annual cost of medical care per person does not differ significantly in the two countries

Pinner Middlesex. H W TOMSKI

*** Comparisons of this kind are misleading whatever rate of exchange is chosen We were, therefore, careful to mention the more instructive statement that medical care absorbs in the U S A 4 9% of the national income and in Britain 4% This seems to refute American suggestions that we are devoting an extravagant proportion of our resources to health —ED L

5 Archer B H *J Amer med Ass* 1950 143 570

1 Bull G M *Clin Sci* 1948 7 77
2 Borg C *J Obstet Gynæc* 1941 48 750
3 Gardiner R H Hart V L *Lancet* 1944 II 500

Notes and News

ISTRIBUTION OF GENERAL PRACTITIONERS

IE suggestions by the Medical Practices Committee [1] for ng a more even distribution of general practitioners been taken to heart by the Ministry of Health In lance with these proposals, executive councils are being [2] to consider, and report by Jan. 31, whether action l be taken to encourage more practitioners to settle in nder-doctored areas enumerated by the committee in ule 1 and in other—particularly rural—areas named in ule 2 where the service may be inadequate The duty cutive councils, says the Ministry, is, in association with medical committees, to stimulate the redistribution of tioners in accordance with the public's needs, and this be achieved by (1) encouraging practitioners to take artners (or assistants preferably with a view to partner or, failing this (2) advertising the need for further tioners, who would qualify normally for a basic salary ossibly for an inducement payment The councils are ded, moreover, that inducement payments may be ved by the Ministry "in order to produce an increase in umber of doctors not only in sparsely populated areas also in those other areas which have hitherto proved vely unattractive to doctors, such as highly industrialised s' Finally where more doctors are needed and houses are, councils are enjoined to enlist the help of the local ng authority

e following amendments have been made to the Medical ices Committee s classification of executive-council s described in our issue of Aug 5 (p 229) Schedule I ins the names of parts where more doctors are needed, lule IV the closed areas'

Schedule I

DELETIONS

rbyshire—Ripley U D
icestershire and Rutland—Melton Mowbray (excluding rby)

Schedule IV

ADDITIONS

eshire—Malpas
nt and Canterbury—Poverest ward of Orpington U D (area ent to St Paul s Cray)
ncolnshire (Kesteven)—Ancaster Caythorpe Navenby
ffolk (East)—Wickham Market (Deben R.D)

DELETIONS

von and Exeter—Brixham Torrington.
ncolnshire (Holland)—Gedney Hill (East Elloe R D)

CORRECTIONS

nt and Canterbury—St. Mary's Cray should read St Mary Cray
ffolk (East)—Pressingfield (Hartismere R.D) should read singfield (Hartismere R.D)

MANCHESTER MEDICAL SOCIETY

T the inaugural meeting, on Oct 4,[3] Mr Wilson Hey, the ndent, traced the origins of the new Manchester Medical ety from the time of the Literary and Philosophical ietv in 1781. This was almost entirely a medical society some thirty years during which time the presidents and t of the vice-presidents were medical men In 1834 the inal Manchester Medical Society was formed, with 91 nbers today there were approximately 1000 Its isactions were printed 107 years ago in the *Provincial dical Journal*—now the *British Medical Journal* Later v were continued in the *Medical Chronicle* which appeared ween 1884 and 1916 Eventually the society moved to en s College—now the Victoria University of Manchester library incorporated with the university departmental aries was the largest in the country outside London, it l almost 100 000 books In 1929 it was given to the versity and now members had the privilege of using the er university libraries In 1879 the microscopical section the society was formed, but since it was apparent that the croscope dealt with only a minute part of pathology, an ependent Pathological Society was formed six years later, l had flourished ever since Mr Wilson Hey referred efly to the formation of the old Clinical Society which sed in 1925 the Surgical Society founded in 1922 and Society of Anæsthetists, the Obstetrical Society the rmatological Society the Ophthalmological Society, the olaryngological Society, the Odontological Section, and numerous others that had developed from these or had been founded by Manchester men. In all, 22 medical societies had been thus originated

Amalgamation, which had first been suggested in December, 1918, but for various reasons had been postponed, was now completed The new society, centred on the university, had followed the pattern of the Royal Society of Medicine, each society becoming a section Each section had its president, who was a vice president of the society, and an honorary secretary There was only one honorary treasurer, and for the first time there was a whole time paid secretary Monthly diaries were being issued, and soon the society would have its *Proceedings* and *Transactions*

The general practitioner was the chief thought of the council, which had in mind the formation of a special general practitioners section The percentage of practitioner members of the various societies had diminished as a result of the Acts of Parliament which came into force in 1911 and 1948, these had converted the practitioner into a "form filling, regulation bound doctor This decline had been assisted by two wars and to some extent by the intermittent post graduate classes The societies and sections had always been postgraduate classes, and now that the general practitioner was a public servant his fees and expenses ought to be paid by the Ministry, because such classes made him a greater asset to the patient and to the nation.

INTERNATIONAL DENTAL JOURNAL

THE first issue of this journal [1] realises a project postponed from before the war The president of the International Dental Federation (F L Nord, of Amsterdam) describes in a foreword the difficulties that have had to be overcome, and pays a warm tribute to the group of British dentists, led by Prof H H. Stones, who have undertaken the editorial work It was hoped at one time that the journal would be written in four languages, but present-day conditions make this impossible and all the articles now appear in English. The contributors include Prof Harry E Frisbie, of California University, who discusses the ætiology of dental caries with particular reference to the proteolytic theories, Mr Bryan Wood, editor of the *British Dental Journal*, who surveys British dental services and Prof W J Tuckfield, who deals with impression techniques in full denture prosthesis

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University of Oxford

The degree of D.M has been conferred on N B Mvant and the degree of B.M on Patience Proby

University of Cambridge

The following degrees have been conferred

M.A—D M T Gairdner
M D—G P Baker Mary Farquharson J A Harrington Alan Lyell P E Perceval.
M.B B Chir—*Elizabeth M. D Craig *George Holden *J F Hort *J D Jackson *J F Lees R P Ross *S E Sebag Montefiore

* By proxy

University of London

At recent examinations the following were successful

D C.P—Dineshananda Baidya L A Blackmore V St E D Abrera Phyllis Dagnall, J L Holme Akhtar Husain, O G Jones *Endre Kertész Felix Kurrein, Max Millard Gopinath Prasad Mohanty Hari Prasad W D Ratnavale, Rosemary J S Sichel Mohan Lall Sur, Andrew Tay, Louis Vogel (academic postgraduate diploma), G T Barnes K. S Daber Narindra Prasad Jain J K F Mason J B Neal (external diploma)

University of Durham

Dr W B A. Smyth has passed the examination for the diploma in public health.

University of Liverpool

Sir James Learmonth will give the William Mitchell Banks lecture on Thursday Dec 7 at 5 P.M., in the arts theatre of the university His subject is to be Portal Hypertension.

University of Manchester

Dr Kathleen V Lodge has been appointed demonstrator in pathology

University of Glasgow

On Nov 4 the degree of M.D was conferred on J T Aitken.

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1 See *Lancet* Sept 2 1950 p 362
2 Ministry of Health circular E C.L. 115/50
3 See *Lancet* Oct. 21 1950 p 486

1 Distributed quarterly by Cassel & Co Ltd 37 St Andrew's Hill London E C 4 (12s 6d per copy £2 5s per annum post free)

a keen personal interest in the welfare of his assistants and his students An exacting professional life did not deter him from undertaking clinical research, and he wrote upwards of 50 papers—many of them on cardiology He was co editor of the *Glasgow Medical Journal*, a member of the Cardiac Society, and a councillor of the Association of Physicians Since 1919 he had been a fellow of the Royal Faculty of Physicians and Surgeons of Glasgow, and in 1932 he was elected to the fellowship of the Royal College of Physicians of London

A colleague writes "There was nothing mean or unworthy about George Allan His outstanding ability and transparent honesty assured him of the respect and admiration of his colleagues Throughout his life he was engrossed in the practice of medicine, and under the influence of a wide and varied experience he matured as a leader endowed with ripe judgment and engaging friendliness Though not lacking in modesty or humility, he never forgot that he belonged to a learned profession and he acquitted himself with dignity and distinction"

Dr Allan died on Sept 8 and is survived by his two daughters His last years were marred by personal sorrow During the war his wife died, and his son, serving in the R.A M C, was drowned in an enemy troopship in the Far East where he had been taken prisoner-of-war

RINGLAND GILMORE BOYD

M C, M.B BELF, D P H

Dr R G Boyd, senior assistant medical officer of health for Gloucestershire, died on Aug 17, a few hours after a road accident, when the car he was driving on his official duties came into collision with a lorry on the Gloucester-Bristol road

Ringland Boyd was the youngest of a well-known County Derry family, and his brothers and sisters have made distinguished contributions to the Services and the professions Born in 1917, he was educated at Coleraine Academical Institution and Queen's University, Belfast, where he graduated M.B with honours in 1941 The following year he joined the R.A.M C and he served in Africa, Sicily, and Italy He reached the rank of lieut-colonel and he was awarded the Military Cross After demobilisation he held the posts of assistant M O H. at Manchester and at Gloucester In 1948 he took the D.P H. and he was appointed to Gloucestershire last April

J K McC writes "Ringland had an engaging personality, he had charm without being effusive, he had ability and yet he was modest His senior and junior colleagues both admired him, for he had great strength of character and strong belief in the principles of freedom, honourable interhuman relationships, and justice A keen tennis and badminton player he was an outstanding sportsman As a friend he was loyal, dependable, and worthy"

Births, Marriages, and Deaths

BIRTHS

AGATE —On Oct 26 in London, the wife of Dr John Agate—a son

DEWAR —On Oct. 26 in Newcastle upon Tyne the wife of Dr H A Dewar—twins, son and daughter

GRAY —On Oct 28 at Strathaven Lanarkshire the wife of Mr T G Gray, M C F R C S E —a son

LOVETT DOUST —On Nov 5 at Croydon the wife of Dr J W Lovett Doust—a son

ROGERS —On Oct 20, the wife of Dr S C Rogers—a daughter

STROTHER-STEWART —On Sept 28 at Ashleigh Newcastle the wife of Mr C R Strother-Stewart F.R C.S E —a son

WILSON —On Sept. 21, to Dr Ruth Ainsworth wife of Mr W W Wilson F R C S —a son

MARRIAGES

HERVEY—KIDMAN —On Oct 28 at Ickleford Herts William Allan Hervey F R C.S.E to Caroline Maude Kidman

ROBB-SMITH—PICKLES —On Oct. 10 at Oxford Alastair Hamish Tearloch Robb Smith M.D to Margaret Muriel Pickles D M

DEATHS

BELL.—On Oct 30 Claudia Anita Prout Bell M B Durh aged 77

BLENKINSOP —On Oct 26 at Imtarfa, Malta Frederick Linton Blenkinsop M.B Lond lieut.-colonel I M.S retd

BLUNT —On Nov 1 at Hastings Eleanor Dorothea Blunt M B Lond., D OBST

FRENCH —On Oct 28 Frank Austin French M.R.C.S

MAYO —On Nov 1 at Cowes I o W Thomas Alfred Mayo B.A M B Camb, F.R.C.S aged 75

Appointments

ADDENBROOKE ENID M.B Birm M R C P, D C H consultant physician pædiatrician North Gloucestershire clinical area

ANDERSON D A P, M A M B Camb M.R C P general physician Reading group of hospitals

ANGELMAN HARRY, M D Lpool M R C P D C H consultant pædiatrician, hospitals in Warrington area, Lancs

BARTLETT C H, M.B Camb F R C S consultant surgeon Bristol clinical area

BARTON DOROTHY, M B. Lpool D O.M.S consultant ophthalmologist Sefton General Hospital Lancs

BLACK DAVID, M B Belf D O M S asst ophthalmologist, Bootle General Hospital Lancs

BURBIDGE H C M R C S D.A anæsthetist, hospitals of Banbury and district and Wingfield Morris Orthopædic Hospital management committees

DODGSON M C H, M.D Lond research neuropathologist Stoke Park Colony

FRASER A M. M.R C.S, M RAD Lpool D M R D asst radiologist, Warrington and St. Helens areas Lancs

FRASER J D M D Glasg D P M consultant psychiatrist, St Andrew's Hospital Thorpe, Norfolk

HALL, H W M B Lond F R C.S consultant orthopædic surgeon. Bath clinical area

JONES I D M B Lond D A anæsthetist, hospitals of Banbury and district and Wingfield Morris Orthopædic Hospital management committees

KEIDAN SIMEON M B Leeds tuberculosis M O, South and Central Liverpool areas

MCDOWALL, G D M B Edin, F R C.S E ear nose, and throat surgeon Royal Infirmary, Edinburgh

MILLINGTON G W H, M B Lpool M R C O.G consultant obstetrician and gynæcologist hospitals in Warrington, Lancs.

MILLIN MARJORIE M D St.And, D.M R T consultant radiotherapist, Liverpool Radium Institute

MOULDEN G A, M.B Lpool D.L.O consultant otorhinolaryngologist Children s Hospital Birkenhead

O BRIEN, GERALD M B St.And D.P H M O.H and school M.O., St Helens, Lancs

ROBERTS E G G M B Wales M.R C P, D C.H consultant pædiatrician Wrexham Powys, and Mawddach hospital management committee group

ROSS N A, M B Aberd D P.H consultant venereologist, Stamford Peterborough and King s Lynn area

WILLIAMS C J, M D Lpool M.R C.P consultant physician Walton Hospital Lancs

WILLIAMS, J R D M.B Lond D P H asst. venereologist Ipswich area

WINTER, JOHN M B M RAD Lpool D M.R D asst. radiologist, Warrington and St Helens areas Lancs

Hospital for Sick Children Great Ormond Street, London

CONWAY D J, M A M B Camb D T.M & H D C H senior casualty physician (senior registrar grade)

DUNCAN DAVID M B Edin house-surgeon orthopædic and plastic departments (junior registrar grade)

HARRIS L C M.D Pretoria M.R.C P house physician (junior registrar grade)

MARTIN MARGARET M B Edin asst resident M O Tadworth Court (junior registrar grade)

NABARRO SYLVIA M B Manc M R C P house physician (junior registrar grade)

SUTCLIFFE JOHN M B Camb M.R.C P D M.R.D asst radiologist (senior hospital M O)

WELCH R G M B Lond M.R C.P house physician (junior registrar grade)

Colonial Service:

AIREY F S, M B Edin M R C P E medical research officer, grade I (dermatologist for leprosy research), Federation of Malaya

BANKS L W M B Edin D T.M & H senior M O Nigeria

BARRETT R E M B Lond, D.P H D T M & H deputy director of medical services Nigeria

BRANCH A G W M B Brist D T M & H senior M O Nigeria

CAMPION C P, M B Camb D T M & H senior M O Nigeria

CLARKE, J H C, M.B Glasg D T M & H senior M O Rhodesia

CRAWFORD WILLIAM M B Dubl D T M & H senior M O, Nigeria

DOHERTY, H A A M B Glasg D T M senior M O Nigeria

ELLIOTT, H D M B Sheff M.O Kenya

FOX F W W M.B Manc senior M O Nigeria

GALL, DAVID M.A B M Oxfd D T M & H medical research officer grade III (research epidemiologist) West African Institute for Trypanosomiasis Research, Nigeria

GILBERT W T M. L R C.P I senior M.O Nigeria

HARRISON W C B L.R C P I D P.H deputy director of medical services Northern Rhodesia

JOHNSON A J M B Camb D T.M & H asst director of medical services Sierra Leone

KEMP P D L R C P.E M O Uganda

KNOMO G K. M M B M O Nigeria

MEARNS A W M D Glasg M O H Jamaica

ONWU S E M B Edin D T.M senior M.O Nigeria

ROMANOWSKI VICTOR, M.D Innsbruck temporary M O Nigeria

SMART W G M B Aberd M O Tanganyika

Appointed Factory Doctors:

BARNETT A D M.R C.S Trowbridge district Wilts

FRASER JAMES M B Glasg Hamilton district Lanark.

RAE J W M B Aberd Stanford le Hope district Essex

SCOTT M M. M.R C.S Bermondsey district London

WILLIAMS JAMES M B Edin Grantown-on-Spey district, Morayshire

Kettle Lecture

Prof L P Garrod is to deliver this lecture at St Bartholomew's Hospital London, E C 1, on Wednesday Nov 22, at 5 P.M., on the Reaction of Bacteria to Chemotherapeutic Agents

Conference on Maternity and Child Welfare

The annual conference of the National Association for Maternity and Child Welfare is to be held at Church House Westminster, on June 27, 28, and 29 instead of on the dates previously announced

International Congress of Clinical Pathology

This congress is to be held by the International Society of Clinical Pathology in London on July 16–20, 1951, under the presidency of Sir Lionel Whitby Inquiries should be addressed to the secretary treasurer, Dr W H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W 9

Research Defence Society

The society's 19th Stephen Paget lecture is to be given by Prof E D Adrian, O M., F.R.S on Wednesday, Nov 22, at 5 30 P.M. in the physiology lecture theatre University College, Gower Street London, W C 1 Professor Adrian's subject will be Experiments on the Nervous System

British Association of Physical Medicine

This association is to hold a meeting in London on Friday and Saturday April 20 and 21 The programme will include a lecture-demonstration on micro waves by Dr A C Boyle and a demonstration on ultrasonics Further information may be had from the secretary of the association, 45, Lincoln's Inn Fields London W C 2

West Midlands Physicians Association

The inaugural meeting of this association was held in Birmingham on Oct 21, when Sir Leonard Parsons F.R.S, was elected president Dr A P Thomson Dr J H Sheldon, Prof W Melville Arnott, Dr A. M. Nussey Dr S R F Whittaker, and Dr P P Stock members of the executive committee and Dr A. C W Whitfield secretary and treasurer

Ophthalmological Society of the United Kingdom

The annual congress of this society will be held at 1, Wimpole Street, London, W 1 on March 29 30 and 31 Mr Maurice Whiting will deliver his presidential address, Mr L H. Savin, Prof G W Pickering Dr F Dudley Hart, Mr A. B Nutt, and Prof E J Wayne will open a discussion on the Association of Ocular and Articular Disease and Sir Henry Dale O M F.R.S will give the Bowman lecture

Congress of Anæsthetists

The 26th annual congress of anæsthetists sponsored by the International Anesthesia Research Society, will be held in London from Sept 3 to 7 1951

The members of the London committee are Dr R W Cope Dr Vernon Hall, Dr Ronald Jarman, Mr A. Charles King Dr C B Lewis Dr G S W Organe Dr C F Scurr, and Dr W D Wylie Papers for presentation at the meeting should be sent before March 15 to Dr Cope University College Hospital W C 1

North of England Surgical Society

The membership of this new society includes surgeons from the North of England in an area corresponding roughly to the Northern Region—that is from Carlisle to Newcastle and from the Tweed to North Yorkshire The office bearers for the first year are president, Prof F C Pybus (Newcastle) vice presidents Mr Norman Hodgson (Newcastle) and Mr J E Monro (Carlisle) secretary Prof. F H Bentley (Newcastle) treasurer Mr H Harvey Evers (Newcastle) members of the committee, Mr D C Dickson (Middlesbrough) and Mr H. B L Levy (Sunderland) Prof G Grey Turner is an honorary member Five meetings will be held in the session with the principal home in the Medical School in Newcastle but with meetings in other large towns in the North. At the opening meeting on Nov 10 Professor Pybus is describing experimental work on carcinogenesis

Colour Television of Operations

The New York Academy of Medicine has arranged for a series of operations to be televised in colour over a closed circuit

Ross Award

This award, which was founded in 1949 by the standing committee of the Ross Institute has been offered to Mr Mehmed Aziz, C.B.E, chief health officer of Cyprus in recognition of his thirty years' work on the control of malaria, culminating in his part in the Cyprus anopheline eradication scheme

Family Life in Flats

The Minister of Health has appointed a subcommittee of the Central Housing Advisory Committee under the chairmanship of Mr Henry Brooke M.P, "To examine social needs and problems of families living in large blocks of flats" Prof J M Mackintosh is a member of the committee and the joint secretaries are Miss M Empson and Mr J C H. Holden, Ministry of Health Whitehall, S W 1

Remedial Work Among School-children

A conference on school remedial work will be held at Victoria Halls Bloomsbury Square London, W C 1, from Jan 2 to 4 by the Ling Physical Education Association in coöperation with the Society of Medical Officers of Health (schools health service group) Particulars may be had from the general secretary of the association, Hamilton House, Bidborough Street W C 1

Hyde Award

The Research Board for the Correlation of Medical Science and Physical Education has given the William Hyde award of £300 for 1949 to Mr H H. Newell engineering superintendent in charge of the rehabilitation workshop of Vauxhall Motors, Luton for the skill and resource which he has shown in developing engineering occupational therapy About 1500 disabled patients have passed through his hands and are now useful employees Some of this work was described in his joint article in our columns (*Lancet*, 1948 ii, 699)

Homes and the Family

A conference on this subject is to be held by the British committee of the International Union of Family Organisations at Caxton Hall London on Thursday Nov 23 from 2 30 to 6 30 P.M. The speakers will include Dr J D Kershaw, who will open a discussion on housing and health. Inquiries should be addressed to the committee's hon. secretary, c/o British Social Biology Council Tavistock House South, Tavistock Square London W C 1

American Public Health Association

This association has given one of its 1950 Lasker awards to the International Health Division of the Rockefeller Foundation for its achievement in the control of infectious diseases—particularly hookworm, yellow fever, and malaria—and the education of health staffs throughout the world Three other awards go to Dr G W Beadle professor of biology and chairman of the biology division at the California Institute of Technology for discoveries that might one day enable man to control transmission of the hereditary factors that invite disease to Dr George Papanicolaou of Cornell University, for outstanding contributions to the early diagnosis of cancer and to Dr E L Bishop director of health and safety for the Tennessee Valley Authority, for original and meritorious accomplishments in public health administration—particularly his striking record in reducing endemic malaria

Nurses' War Memorial Chapel

On Nov 2 the Queen opened the Nurses War Memorial Chapel in Westminster Abbey and unveiled the memorial window by Hugh Easton The Princess Royal was also present, and among those who attended the ceremony were the Prime Minister the Secretary of State for Scotland the Secretary of State for Colonial Affairs the Speaker of the House of Commons Lord Addison F.R.C.S Mr Clement Davies Admiral of the Fleet Lord Cunningham and Field-Marshal Lord Alanbrooke The chapel was furnished by the gifts of nurses and midwives through the British Commonwealth and Empire Nurses War Memorial Fund launched in 1946 by the *Nursing Mirror* A second object of the fund is to provide postgraduate travelling scholarships for nurses and midwives of the British Commonwealth and Empire For this purpose £100 000 is required of which £77 000 has already been received The address of the fund is Dorset House Stamford Street London, S.E 1

University of Aberdeen

The following degrees have been conferred

M D—I A Anderson A D Macrae, Alexander Mair (with honours) I C Cowan L G Tulloch

M B Ch.B—C U Webster Rosamond Beattie (with honours), Elizabeth A F Priest J G Stewart, D M McLellan (with commendation) Elizabeth P Bell, A M Blackwell, I M Brooker W R Bruce W R Buchan J N Burry, D D Carmichael J P Chadwick S C Clifford A M Cook G J Cordice G G Duncan, A L S Duthie A T Edwards Jean McG Edwards A L Florence N G Fraser D T Gordon, Dorothy Gray K T Gruer R T S Henderson A F Henry R W Hilton N B Hopper W I Horne C R Innes George Innes G S Joss Janina E Koperska A W Laing R A Laing G S Laird Zofia K W Laszewski Helen C Lawson Garth Lorimer A D Lyall D S McConnach D J McCulloch W G MacDonald Winifred W McDonald A W McIntosh William McIntyre Ian Mackay James McKay Murdoch Mackay K J Maclean H N MacPhail R T Macpherson, Norman Marshall Valerie M Milne R A Mitchell D M Moir J S V Mouat R R Mowat Muriel J Mucha D R Murray N T Nicol T A A Pearce W J W Rae Frances S Ritchie, Margaret Robson, Helen C de C Roll N Z Sacks H G Saunders Alexander Sillars L C Skinner D M Slessor I W J Strachan James Strachan, Dorothy A Sutherland K I Sutherland Janina Z M Szamocki, A J Taylor Katharine J Thicknesse Isabella E M F Thomas, I D H Todd Audrey M G Towns, E I Watty, Dolores F Webster R D Weir

Royal College of Physicians of London

At a comitia held on Oct 26, with Dr W Russell Brain, the president, in the chair, Dr W G Wyllie, Dr L B Cole, and Dr F Avery Jones were elected councillors

Dr V H Springett was appointed Milroy lecturer for 1952, his subject being An Interpretation of Statistical Trends in Tuberculosis The Jenks scholarship was awarded to P M Scott (Epsom College)

The following were elected to the membership

A P C Bacon MB Camb G A Beck, MB Lond E A Beet, LRCP Leon Brotmacher MB Lond N J Brown MB Brist W J G Burke MB Sydney R A Burston MB Adelaide F G Campbell MB Lond F S Carter MD Camb Sydney Cope MD Leeds Brian Creamer, MB Lond G S Crockett, MB Camb, G W Csonka MD Belf B A D Curtin MB Sydney R G Epps, MB Sydney L P L Firman Edwards MD Camb A A Fraser MB Sydney J V Gordon MD Adelaide E P W Helps MD Lond Constance M Hesling MB Lond H D G Hetherington, MD Lond major RAMC Yee Ip MB Hong Kong Pashupati Nath Laha MD Patna M W Leivers MD Lond, Ronald Lwin MB Calcutta John Mackinnon MB Sheff R S Male MB Birm, H G Mather MD Western Reserve, MB Camb Jagadish Manubhai Mehta MB Bombay Arabinda Bihari Mukharji MB Calcutta D R L Newton LRCP C M Ogilvie MB Lpool C M B Pare MB Camb Margaret M Platts, MB Sheff W L Sanders MB Lpool captain RAMC George Selby, MB Sydney D F Sharvill LRCP R H Vines MB Sydney W V Wadsworth MB Manc, Joan C Wells MB Lond G B Westmore, MD Melb

Licences to practise were conferred upon the following 154 candidates (128 men and 26 women) who have passed the final examination of the Conjoint Board

R G Adams W V Agnew D G E Alldridge D F A Aubin J A C Bamford Agnes R D Bartels Ivor Blakeway R M Bland M H S Bound Betty B Boxall Yvonne J Bradfield G S Brindley I M. Brown A A F Bryson Patricia M Bushell, E P Cadbury, W H Callander S J Carne, Mary A Carter, M. W Cemlyn Jones H N Chambers E H Cooper Sheila D Cooper, C H Corby R G Covell Elizabeth P Cracroft J R Currie A J I Dacre Mary G C A Dale D F C Deacon G R C Deacon N S de Alwis J H de Graeve Helen M. Dence M A de Valero Wills J A Dickinson P L C Diggory, S B Donigiewicz J W Draper Winifred B Drew P G J Duncan Brian Edwards Ibrahim Aly El Bahrawy B R Ellis, Peter Engel J E Epsom, M L E Espir J F A Everson P V N Ezekwe Mary U Franklen Evans Tristram Freeman R E Graham W S Griffiths I M. Guiver T K Hardy J G M Harrison Robina Harry Ursula E E Henderson P G Higgins Donald Hines G C A Holden J M Holden, P F B Holmes, W D Hopkins Harry Horwitz Desirale M G Howells, St C M. L A Hubbard P E Huddy E M. Hume Anne L Hunter Elsie S Jaikaran Antoni Jedrzejczak M. H F Johnson Pamela M Johnson E T J Jones R J B H Jones Norman Kaye P H Kendall D G Kibblewhite D E W Knight, F W Knowles Robert Korn J P Lavender, A C K Lawrence, Eileen Lawson Matthew A D Leschen Mair E Lewis Margaret E Lloyd D H M Lord R J Lunniss Neil MacDonald, K M McFadyean K E MacLachlan, A D McLaughlin A R May D H Mellins R P Michael, Gerald Miller B K Montgomery Jean E Moore Margaret C R Moore Doreen P Morgan J G Norman R G Owen H J G Palmer Mary Parsons D L Pedersen B W Petty H F Pile, E N Plomer H F W Pribram, J K Price R. B Pridie J H Ratcliffe J H Reading R B O Richards Margaret M. Roach B A Roberts, A L Ross, J W Rotenberg J J H Rymer H N St John Barbara J Salisbury J F Santer F B Sartory S A Seligman I M Sharpe I M. Simmonds E M E I Sondervorst N E Stebbings F P Stephens K H Stone J D Sutcliffe R. A Sutherland L R Sweetman S S Swift, Ginette M. Tebbutt, I B Thomas P K Thomas H T Thompson D J G Tilley J A Tottle Rachel E Turner, Raymond Vickers F H Walker I H Wallington A V Watts W I White Philippa M D Wigan J Ll Williams R A Williams J B Williamson J P W Young T M Young

The following diplomas were conferred conjointly with the Royal College of Surgeons

D C H—R P Aronson Anne L Barlow Dorothy V Bignell Savell Binder Winifred M. Bond I S Booth F S W Brimble combe, Elspeth S K. Campbell Nirmalprabha Chaliha, Patricia Chippindale Sultan Ahmed Chowdhury Jill C Clark, Pauline M. Cole Maureen D Connolly Lorna H Cooper Leonora A Crawford, Jean M Dance Cecile R Doniger, A S Dunn H G Dunn, B. E. Eaton Sarah Evans, Sheila M. Forsyth W P Foster Catherine E E Frain Bell Joy K Goodacre Ruth Goodier Anne Guy Eve Hammer D McR Hanna, Syed Abdul Hafeez Haqqani R. P Harwood J C Haworth Margaret I Hendrie Hans Herlinger Rachel M Hickinbotham Eugenie C Illingworth R J Isaac Elizabeth M Johnson D V M. Jones, M C Joseph, Pallat Kalyanikutty, Banjamin Kaminer Kul Bhushan Kapur, K. R. Keay Marshall Kennedy J D Kerr, Bal Sitaram Kulkarni, Lillian J Letty C S Livingstone, Freda W Lunt, J B Lyn-Jones D A McGreal Blanche M MacIver R S Male Ali Mohammad, C M. Monro S A M. Morton, M J Murray Eri Mukasa Katonya Muwazi Sylvia N Nabarro Dinkar Shankar Nadkarni J L Neville, Dunough-O Brien T E Oppé R H Percival, Suraj Prakash Elizabeth Preston Thomas Leslie Rabinowitz, Irene Rajaratnam K V Robinson Christine M Rooke R G Rooney Jack Ruble, Sahgal Madan Lall Sanatkumar Hiralal Shah, J F Skone R W Smithells Rosemary Stephens Margaret E R. Stoneman Elizabeth G S Summerhayes G T Tandy Cyril Taylor J H Thomas, Margaret R Topping Iris V I Ward Pamela E Warner Evelyn D Watkins Elizabeth L Watson Mary B Watson, Peter West, S T Winter

D I H—J A Dryden D G Evans I S Eve Settihally Deve Gowda Narayana Gowda Mohan Singh Kataria, J C McDonald, R A G Smith, P A M. van de Linde

D T M & H—C B Andrade J E Azar Stanley Bell Basil Blewitt, G F J Campion Margaret T Chambers J G Craddock Saroj Kumar Das, Ramakant Chimanlal Desai Soraya Tewfik Gaballa J M B Garrod H M J Gilles C F M. Gunther, Ursula M. Hay R G P Heard Kramol Jambundabongse Lillyan G Jayawardene Abdul Majid Khan Vishnu Jamnadas Kinariwala Kia Joe Lie Locan Eng Lie Injo, W C D Lovett, Marie D Merchant, E D Myers S E N Otoo, Wallace Peters H M G Shanly Leslie Silverstone Jagjit Singh Sood Madanlal Sagarmal Vaidya, Sarla Vaishnava J L C Whitcombe Albert Zahra

D M R D—P F J New, G A Smith

D Phys Med—W St J Buckler D A Kininmonth, J B. Stewart H F B Symons D L Woolf C B Wynn Parry

Royal College of Obstetricians and Gynæcologists

The following have been admitted to the membership

G T Altimas J D Andrew P R Blahey G T Carson C. J Champ F L Clark T R Clarke W W Coppinger, B M. Corkill, E D Crichton Thomas Dean C N DeGaris William Donovan H P Dunn, Isabel L Dyke, M W Elliott C J Farr Balqis Fatima, W R Foote M B Fox H H Francis A C G Frost, W D Giffen, C A Haxton H A Henderson H F Hills Robert Hodkinson R H Horner D R Hughes T G Ingram D J Mcl Irvine, H A Kelsey Devaki Kutty J F Leaver J L MacArthur D C McEwen, K T. MacFarlane Ishbel M Macnie C M H Malz, W D Marshall Helen M. Noble R H O Hanlon Doddana Goud Prakashi Paranjothy M G Pearson Ebv Quehl Prins Daramaratnam Rajaratnam Indira Ramamurthi K F Read H A. Rowley A M Rutherford S A Scorer D R Shoumack E M. Southern D W Sparling Subodh Kumar Sur Roy Shri Nath Upadhyay L G R Van Dongen D B Beckwith Whitehouse Joel Wilbush E A Williams M H V Young

Royal College of Physicians of Ireland

The following were admitted on Nov 3 to membership of the college

N P Bector W. G D Caldwell W W Ghali D E Mellon and G H A Chamberlain

Royal College of Surgeons of Edinburgh

The following office bearers have been elected for the coming year president, Mr W Quarry Wood, vice president Mr Frank Jardine, secretary and treasurer, Mr J J Mason Brown president s council Prof R C Alexander, Mr K Paterson Brown Mr John Bruce Mr A J C Hamilton, Prof C F W Illingworth, Mr James Jeffrey Sir James Learmonth, Mr Robert Mailer, Prof Walter Mercer, Mr T McWalter Millar, Mr Douglas Miller, Mr R Leslie Stewart, representative on the General Medical Council Sir Henry Wade conservator of museum, Mr J N J Hartley, convener of museum committee, Mr Bruce, librarian, Mr Douglas Guthrie

The following have been admitted to the fellowship

Ewan Cameron, H McK. Carey A F Crook, A P McE Forrest Alexander Hart, R F Hendtlass, R P Hewitson Shriniwas Dattatraya Joshi R T S Louttit J A Mantle Namubhai Gulabbhai Mehta H C Reid Ahmed Rashad Ghoneim Salem J T Shearer, M. N Tempest Richard Yaholnitsky

Royal College of Surgeons of England

On Wednesday Dec 13 at 4 PM, Mr William Doolin, FRCS, a member of the Royal Irish Academy, will deliver the Thomas Vicary lecture on Dublin s Surgeon anatomists

Royal Faculty of Physicians and Surgeons of Glasgow

The following have been admitted fellows of faculty qua physician J D H Bankier, Andrew Meiklejohn, and Mir Mousiquddin

Leeds Medical Dinner

The 60th annual dinner of past and present men students of the Leeds School of Medicine will be held at 7 30 PM. on Friday, Nov 24, at the Great Northern Hotel Leeds

SUPPURATIVE PNEUMONIA *

HOWARD NICHOLSON
M D Lond, F R C P
ASSISTANT PHYSICIAN, UNIVERSITY COLLEGE HOSPITAL, CHIEF MEDICAL ASSISTANT, BROMPTON HOSPITAL, LONDON

With illustrations on plate

I USE the term "suppurative pneumonia" to mean an inflammatory consolidation of the lung which proceeds in whole or in part to suppuration This can occur in the course of certain specific pneumonias There is also a large group of cases of suppurative disease of the lungs in which the organisms recovered are a mixture of types, none of them regarded as having invasive properties for the normal lung, and many of them indeed being found in the normal upper respiratory tract, it is to these that I intend to devote particular attention

Specific Pneumonias

Pneumococcal Pneumonia

I wish first of all to describe certain features of those specific pneumonias which are associated with suppuration, to make clear their separation from the other group In pneumococcal lobar pneumonia lung abscess is rare Many writers have observed radiological features in the course of resolving pneumococcal pneumonia which they have regarded as simulating single or multiple abscesses (Graeser et al. 1934, Gleich 1932) Kessel (1930) described eight cases of this sort Cecil and Plummer (1932) record an incidence of 0 4% and 0 5% in cases of type I and type II pneumococcal pneumonia, in 1000 cases of each type Kessel attributed the lesion to thrombosis of an artery, and stated that the abscesses usually gave rise to no symptoms and healed rapidly and completely Other authors (Gleich 1932, Massachusetts pneumonia series quoted by Heffron 1939) describe complete disappearance of the lesion in two or three weeks It is, I think, reasonable to say that these abscesses in pneumococcal lobar pneumonia appear as translucent areas in radiographs taken during the stage of resolution Although some may represent true cavities, they are not associated with the production of sputum and they rapidly disappear

Staphylococcal Pneumonia

In staphylococcal pneumonia abscess formation is an important feature The clear recognition of this we owe to the work of Brock (1945) Most of the other reports —for example, that by Chickering and Park (1919), whose cases were observed during the 1918 influenza epidemic—deal with an acute type of disease with a very high mortality after a short illness Staphylococcal pneumonia has been most often described as occurring in influenza epidemics, and cases are recorded in which both influenza virus and staphylococci have been demonstrated in the pulmonary lesions (Scadding 1937), but sporadic cases do arise, particularly with other respiratory infections or during the course of chronic debilitating disease

Its onset, as described by Chickering and Park, is insidious and rarely accompanied by the rigor and localised pain of pneumococcal lobar pneumonia Prostration is an early feature, with high remittent fever but relatively slow pulse rate Physical examination in the early stages often shows little abnormality, though radiographs usually reveal scattered opacities which may be widely distributed in both lung fields or confined to one lung or lobe In this phase the sputum is usually scanty, purulent, and not fœtid It is described by Chickering and Park as resembling anchovy sauce, but this is by no means common, and it is often simple pus from which a pure growth of *Staphylococcus aureus* can be obtained During the winter of 1948–49 I observed three cases in which death occurred less than twenty four hours after the onset In two there was scattered consolidation throughout both lungs, while in the third the consolidation was confined to the left lung In none of these was abscess formation evident clinically or radiologically

There is, however, a less rapidly overwhelming variety of the infection, and it is in this that abscess formation becomes clinically recognisable The fever may continue high and remittent, but commonly it settles, only to rise irregularly during the progress of the disease The sputum usually increases gradually and other organisms are found in it The radiological appearance alters, and in the pneumonic areas either single or multiple abscess cavities appear Brock (1945) has pointed out that these are characteristically empty or almost empty, and present a thin walled, soap bubble appearance, particularly when they are situated in the midst of apparently normal lung An abscess may rupture into the pleura and produce a pneumothorax—an event more common in infants than in adults Clear pleural effusions may also occur as well as empyemata

The stage of abscess formation may continue chronically, and the bacterial flora of the sputum then becomes indistinguishable from that of non specific pulmonary suppuration In other cases the inflammatory process subsides, but when this happens the large distension abscesses characteristic of the condition are often slow to disappear, and occasionally they persist and are wrongly regarded as congenital cysts

Abscess formation in the lungs may also be due to staphylococcal pyæmia from a focus elsewhere in the body Typically the abscesses in this condition are multiple, small, and empty but clinically and radiologically the distinction from the abscess phase of staphylococcal pneumonia can be very difficult The treatment of both types is the same the avoidance of surgical drainage and the giving of sufficient penicillin

The following case shows some of the features I have been describing

Case 1 —The patient, a boy aged 15, was admitted to the Brompton Hospital early in February, 1947 His illness had begun in mid-January with fever, cough, and a little sputum He was kept in bed at home until late January when he was admitted to his local hospital During this time he remained highly febrile and had developed septic sores on his left forearm and right foot His left knee had also become swollen and tender, and his left thigh painful

On admission he was flushed, drowsy, and very ill His temperature varied between 101° and 103°F He had a cough with very little purulent sputum He was complaining of pain in his left knee, which was swollen, and he also had a swelling on his left thigh Radiographs a few days before admission (figs 1 and 2) showed an enormous abscess cavity with a fluid level in it in the upper part of the right lung In the film taken on admission the appearance suggested that there was also some fluid in the right pleural cavity This pleural cavity was aspirated and 12 oz of pinkish thin pus obtained, from which *Staph aureus* was grown in pure culture Sulphamezathine and penicillin courses were begun and penicillin was instilled into the right pleural cavity at the end of the aspiration

The patient rapidly improved, a week after admission his temperature became normal and it remained so Ten days after admission radiographs showed the abscess to be slightly smaller, at this time his sputum increased to 4 oz a day Penicillin was stopped after three weeks, when the patient was well his sputum having diminished to only a trace each day A radiograph (fig 3) taken a month after admission shows the pulmonary cavity remaining as a thin walled cyst

The boy went home and has since remained in good health The closure of the pulmonary abscess cavity was watched

* The Goulstonian lectures for 1950, delivered at the Royal College of Physicians on Jan. 10 and 12

Medical Care in Korea

On his return from Korea last month, Major General Raymond W Bliss, surgeon general of the U S Army, remarked that, during the campaign there mobile surgical hospitals in the forward areas had recorded less than 1 death for every 100 admissions It seemed that the record in the late war, when three out of every four wounded admitted to hospital were returned to duty, might be surpassed in this campaign Admissions for disease were only slightly higher than those for wounds and non battle injuries

Analgesia in Domiciliary Midwifery

At the end of 1949, altogether 6674 of the 7864 midwives working in the domiciliary midwifery service of the local health authorities had been trained in the use of analgesics, compared with 6065 six months earlier The number of gas and air machines available to domiciliary midwives increased during the second half of the year from 4729 to 5425, and analgesia was given by midwives in 69,915 cases, compared with 58,969 in the first six months of the year and 40,177 in the second half of 1948

London County Council

Dr Verner Wiley, a senior medical officer in the L C C public health department, has retired

Dr Wiley qualified M B R U I with honours in 1909 and four years later he graduated M D with first-class honours and the award of a gold medal He gained the D P H with honours in 1920 and in that year he joined the L C C as an assistant medical officer in the school medical service Subsequently he was in charge of a remand home and he prepared the first comprehensive reports on juvenile delinquency For the last fifteen years he has controlled the branch responsible for the medical examinations of the council s staff and for the medical examination work in relation to mental ascertainment under the Mental Deficiency and Education Acts

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Sir Henry Tidy has been appointed a commander of the Belgian Order of the Crown

Dr G S W Organe, anæsthetist to Westminster Hospital, is on a lecture tour, arranged by the British Council, of Italy, Turkey, Syria, and the Lebanon.

The Royal National Hospital for Rheumatic Diseases, Bath, have published the third volume of their reports, which contains reprints of papers published by the staff in 1948–49

Doctors can now obtain a free copy of the 1950 register of speech therapists from the Board of Registration of Medical Auxiliaries, B M A. House, Tavistock Square, London, W C 1

The British Rheumatic Association has published the first issue of a quarterly journal—the *B R.A Review*—intended for lay readers The association's headquarters are at 5, Tite Street, London, S W 3

The interim Report on the Future Provision of Medical and Allied Services (1920), commonly known as the Dawson report, which has been out of print for many years, has now been reprinted by the King Edward's Hospital Fund for London, with the permission of H.M Stationery Office Copies may be obtained from the fund, 10, Old Jewry, E C 2

The business established early this century by George F Merson, an Edinburgh pharmacist, for the manufacture of sutures was acquired in 1947 by Messrs Johnson & Johnson. Under the name of Mersons (Sutures) Ltd it began to use the trade mark 'Ethicon,' and its name has now been changed to Ethicon Suture Laboratories Ltd

The explanatory booklet *Superannuation Scheme for those engaged in the National Health Service*, which was published in 1948, has now been revised The new edition includes changes made in the original scheme by amending regulations New entrants to the service will be given a free copy of the booklet, which is also on sale at H.M Stationery Office (3*d*)

Once again the Grenfell Association of Great Britain and Ireland will be selling Christmas cards depicting various aspects of life in Labrador An illustrated leaflet reproducing the 13 cards and the label available can be obtained for 1*d* from the secretary at 66, Victoria Street, S W 1 All profits from the sale of the cards will be devoted to the association's medical work among British settlers in Labrador and Newfoundland

Diary of the Week

NOV 12 TO 18

Monday, 13th

MEDICAL SOCIETY OF LONDON 11, Chandos Street, W 1
8 30 P M Dr C H C Toussaint Dr Alec Wingfield Dental Management of Pulmonary Tuberculosis.
INSTITUTE OF OPHTHALMOLOGY Judd Street, W C 1
5 30 P M Mr D Ainslie Clinical Application of Aureomycin in Ophthalmology

Tuesday, 14th

INSTITUTE OF DERMATOLOGY St John s Hospital, Lisle Street W C 2
5 P M Dr J O Oliver Pathology
INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W C 1
5 P M Prof A Biemond (Amsterdam) Thrombosis of the Arteria Basilaris
INSTITUTE OF UROLOGY St Peter's and St Paul's Hospitals Henrietta Street W C 2
11 A M Dr W N Mascall Gonorrhœa in the Female
EDINBURGH POST GRADUATE BOARD FOR MEDICINE
5 P M (University Anatomy Lecture theatre) Prof. M. L Rosenheim Treatment of Acute Nephritis

Wednesday 15th

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE 28, Portland Place W 1
3 30 P M Dr A B Stewart Health Services available to the Public through the Local Authority
INSTITUTE OF DERMATOLOGY
5 P M Dr R W Riddell Medical Mycology
INSTITUTE OF UROLOGY
11 A M Dr A H Harkness Abacterial Urethritis
EUGENICS SOCIETY
5 30 P M (Burlington House, Piccadilly, W 1) Dr Emanuel Miller Constitution and Mental Illness—the Scope and Limits of Psycho analysis
ROYAL FACULTY OF PHYSICIANS AND SURGEONS, Glasgow
6 P M Prof H N Green The Fundamental Nature of Shock (John Burns lecture)

Thursday, 16th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S W 1
5 P M Dr E R Cullinan Clinical Interpretation of Jaundice (Bradshaw lecture)
UNIVERSITY OF LONDON Senate House W C 1
5 30 P M Prof F A E Crew F R S Biological Aspects of War
ST GEORGE S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner S W 1
6 30 P M Dr Denis Williams Neurology lecture-demonstration
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE
7 30 P M (London School of Hygiene and Tropical Medicine Keppel Street, W C 1) Laboratory meeting
INSTITUTE OF NEUROLOGY
5 P M Dr R S Allison Cerebral Anoxia.
INSTITUTE OF PSYCHIATRY Maudsley Hospital Denmark Hill, S.E.5
3 P M Prof J Z Young F R S Cortical Structure and Function
INSTITUTE OF UROLOGY
11 A M Dr Harkness Reiter's Syndrome
NUFFIELD ORTHOPÆDIC CENTRE, Wingfield Morris Orthopædic Hospital Oxford
8 30 P.M Mr J Pennybacker Distant Reflection of 100 Cases of Lumbar Disc Lesions
HONYMAN GILLESPIE LECTURE
5 P.M (Edinburgh University Anatomy Theatre) Dr I M Farquharson Bronchoscopy—Medical Diagnosis and Treatment.
LIVERPOOL MEDICAL INSTITUTION 114 Mount Pleasant Liverpool 3
4 P M Sir Stanford Cade Chemotherapy of Cancer (Florence Blair Bell lecture)

Friday, 17th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS 58 Queen Anne Street, W 1
NOON Mr Bethel Solomons Sterility
3 P M Mr A H Charles Surgical Problems in Gynæcological Practice
5 P.M Mr A J McNair, Mr Ian Donald Mr L B Patrick Mr D M Stern Mr S G Clayton Any Questions?
ROYAL MEDICO PSYCHOLOGICAL ASSOCIATION
2 15 P M (1 Wimpole Street, W 1) Prof Aubrey Lewis Henry Maudsley (Maudsley lecture)
MAIDA VALE HOSPITAL MEDICAL SCHOOL, Maida Vale W 9
5 P M Dr Blake Pritchard Clinical neurological demonstration
INSTITUTE OF LARYNGOLOGY AND OTOLOGY Gray s Inn Road W C 1
4 30 P M Mr V E Negus Physiological Principles in the Treatment of Diseases of the Nose and Throat.
INSTITUTE OF OPHTHALMOLOGY
5 30 P M Mr H E Hobbs Angle of Anterior Chamber
BIOCHEMICAL SOCIETY
2 P.M (Wright Fleming Institute St Mary s Hospital Medical School Paddington W 2) Scientific papers
MIDDLESEX COUNTY MEDICAL SOCIETY
3 P M (Hillingdon Hospital Uxbridge) Demonstrations Dr C G Barnes Factors Influencing the Mortality of Heart-disease in Pregnancy
FACULTY OF RADIOLOGISTS
2 15 P M (Royal College of Surgeons) Dr Constance Wood Dr A A Charteris Radium Beam Therapy

Saturday, 18th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS
9 45 A M Mr Aleck Bourne Non malignant Pathology of the Cervix
11 30 A M Mr L B Patrick Genital Prolapse

was displaced to the left, and the left dome of the diaphragm was raised, there seemed also to be cavitation in the upper part of the lesion Numerous examinations of his sputum for the tubercle bacillus were negative His condition became steadily worse, and the consolidation in his left lung even more extensive It had proved impossible by the usual means to grow organisms from his profuse sputum, but by appropriate methods of culture a pure growth of a micro aerophilic non hæmolytic streptococcus was obtained This was penicillin sensitive, and a course of penicillin, 50,000 units three hourly, was begun.

By the end of October he was greatly improved clinically, his sputum was reduced from 15 oz to 1 drachm each day, and his radiograph showed considerable clearing He continued to improve steadily, and when the course of penicillin was stopped five weeks after his admission he was free from sputum

He was discharged home six weeks later, symptom free and having gained 22 lb in weight during his stay in the sanatorium. Since then he has remained well, apart from occasional colds, and radiographs of his chest show that there is some residual fibrosis confined to the left upper lobe

Other Specific Infections

Other specific infections besides those due to bacteria produce suppuration in the lung Thus, cases of lung abscess due to *Entamœba histolytica* are described (Harrington 1930) Histoplasmosis (Parsons and Zarofonetis 1945) and coccidioidomycosis (Winn 1941, Greer and Grow 1949) may cause pulmonary abscesses, but this has not been reported in this country Actinomycosis, although very rare (Macnab 1945), is the only fungus infection of importance here It often presents as a chronic pneumonia (Poppe 1946, Decker 1946) associated with purulent sputum and multiple small pulmonary abscess cavities Its diagnosis is difficult, and in the reported cases it was not uncommon for several months or even years to elapse before the organism was demonstrated in sputum or—perhaps more commonly—in pus draining from chest wall sinuses

BRONCHOGENIC CARCINOMA

Another group of cases of pulmonary suppuration, which I think are best considered separately from the non specific group, are those related to bronchogenic carcinoma Maxwell (1934) studied the post mortem findings in 315 cases where suppuration had occurred in the lungs, and he divided this series into two groups according to whether abscesses were single or multiple He found bronchial carcinoma in 32 cases of the single abscess group, which comprised 199 cases, and in 2 of the multiple abscess group of 116 cases In addition, in the first group there were 13 cases, and in the second group 3 cases, in which œsophageal carcinoma had invaded the lung Thus in 50 cases pulmonary suppuration was related to intrapulmonary growths—an incidence of 15 9% In Brock's (1948a) series of 405 cases of lung abscess, bronchial carcinoma was the cause in 56—an incidence of 13 8% As Maxwell points out, most articles on pulmonary suppuration deliberately exclude consideration of intrathoracic malignant disease Since most of these articles are concerned with clinical aspects and particularly with treatment, this is not unreasonable, for the prognosis and treatment in such cases are those of the malignant disease rather than of the pulmonary suppuration, although the suppuration may greatly influence the course of the illness and may modify treatment Nevertheless, perhaps partly because of this exclusion, the very important association of bronchial carcinoma with pulmonary suppuration is inadequately recognised This association is most common in middle aged and elderly patients and Brock found that of his 56 patients with a lung abscess due to bronchial carcinoma, 53 were over 45 years of age

It has for some time been recognised that there are two main ways in which bronchial carcinoma may produce abscess of the lung The first is by breakdown of the growth itself As Tudor Edwards (1946) pointed out, it is commonly the squamous cell type of growth that breaks down in this way, and the abscess so formed has characteristically a thick and often irregular wall. The second way is by infection of the lung distal to the bronchus obstructed by the growth It is interesting that, although obstruction of a bronchus by a foreign body is regarded as a frequent cause of lung abscess, Brock (1947c) found it only 3 times in 363 cases On the other hand, bronchial carcinoma is so commonly related to lung abscess that in middle aged and elderly patients with pulmonary suppuration the possibility of neoplasm must always be borne in mind

Non-Specific Suppurative Pneumonia

The remainder of these lectures is devoted to certain aspects of those cases in which specific ætiological factors are not found In the last twenty years at any rate reports on non specific pulmonary suppuration have been written mainly by those whose interests are primarily surgical The one important exception is the article by Maxwell (1934), which is based on a study of post mortem material. The cases most frequently described are, therefore, those in which abscess cavity formation was the outstanding clinical and radiological feature, or those which were fatal Such descriptions do not, I believe, give a complete picture of non specific pulmonary suppuration It is more reasonable to regard lung abscess as the most severe variety of a whole range of aspiration pneumonias, at the opposite extreme are those benign localised pneumonias associated with upper respiratory infections In order to support this view, I propose to review some of the evidence that infected material may be aspirated into the bronchial tree and produce pulmonary changes, and to give examples of aspiration pneumonias of varying severity

BENIGN ASPIRATION PNEUMONIA

In 1939 Ramsay and Scadding published an account of 21 cases seen in two years at a tuberculosis clinic These cases were characterised by the association of mild respiratory catarrhal symptoms with transient radiographic shadows in the lungs They referred to the work of Quinn and Meyer (1929) and of Amberson (1937), who showed that iodised oil introduced into the noses of sleeping subjects could next morning be demonstrated radiographically in alveoli Further, they quoted Gunn and Nungester (1936), who, in the course of attempts to produce experimental pneumoccocal pneumonia in rats, were able to produce transient pneumonia by the intra bronchial injection of mucin alone It seemed therefore possible that mucus, either from the upper respiratory tract or of bronchial origin, might obstruct bronchi or bronchioles and produce the sort of mild transient pneumonia which they had described As Scadding (1948) has pointed out, these transient shadows are very often seen in patients with chronic bronchitis, asthma, or chronic abnormalities of the upper respiratory tract causing excessive secretion, as well as with acute respiratory catarrh It is, I believe, now generally accepted that these transient radiographic appearances are best interpreted as aspiration pneumonias In these cases the sputum usually contains only those types of bacteria which may be found in the normal upper respiratory tract, and none of these is specifically invasive for the lungs In these circumstances, the bronchial or bronchiolar block producing atelectasis beyond the obstruction is the more important factor The inflammatory reaction produced in the airless lung by the bacteria present in the blocking mucus plug is slight and rapidly proceeds to complete resolution

ASPIRATION IN PATHOGENESIS OF LUNG ABSCESS

In discussions of the pathogenesis of acute abscess of the lung, the main controversy has been whether it was

radiographically, and by June, 1947, there was no evidence of a cavity

Friedländer's Pneumonia

Another of the specific pneumonias in the course of which abscess formation may occur is that due to Friedländer's bacillus Pneumonia due to this organism is rare—in large series of all varieties of pneumonia (Solomon 1937, Bullowa 1937, Heffron and Varley 1932), approximately 1% have been due to this organism The illness is usually severe with a very high fatality A more chronic form has, however, been recognised for many years Thus, Belk (1926), who investigated a group of cases which came to autopsy, described three as "chronic suppurative pneumonitis," and stated that the course of the disease was similar to that of pulmonary tuberculosis Brock (1946) found reports on eighteen cases, to which he added two of his own, in which the acute specific pneumonia of Friedlander's bacillus "did not end fatally but broke down to form abscesses and assumed a chronic suppurative course"

The course of Friedländer's bacillus pneumonia has been described by Collins and Kornblum (1929) They regard the earliest stage as a lobular pneumonia The lobular areas coalesce and produce more massive consolidation, which is not usually confined by lobar boundaries Several such areas may be present in one or both lungs, and Collins and Kornblum apply to this type of consolidation the term "pseudolobar pneumonia" In these areas the lung is extensively destroyed, with the production of abscess cavities, and at this stage the disease usually ends fatally

Clinically the onset is sudden The patient is severely ill with a fever which does not usually rise above 102°F There are usually few abnormal physical signs in the chest, but there is often a leucocytosis, the white cell count reaching 15,000 per c.mm, with a polymorphonuclear percentage of about 85 (Belk 1926) The sputum is tenacious with little odour and contains the organisms in large numbers

Thus, the possibility of Friedländer's bacillus as the causal organism must be borne in mind when abscess formation occurs in areas of massive consolidation during acute pneumonia In chronic pulmonary suppuration also, this organism must be remembered, perhaps particularly in cases resembling pulmonary tuberculosis but in which the tubercle bacillus cannot be found This has become even more important since the introduction of streptomycin, which has proved effective against experimental infections with Friedlander's bacillus (Heilman 1945) There are also some records of its clinical use in pulmonary infection with this organism (Harris et al 1947, Hennell and Nicholls 1945)

The following case was treated with streptomycin, and apparently complete resolution occurred

Case 2 —A labourer, aged 33, had for many years had a cough with some sputum, and on demobilisation from the Army had been told that he had chronic bronchitis He had felt well and was doing heavy work until five days before admission to University College Hospital, when he had suddenly developed pain in the right side of his chest He felt ill and had a headache, his cough became worse, and the following day he coughed up sputum which was mixed with bright blood During the next day or two his sputum became purulent

On admission he was very ill, he was febrile to 102 4°F, and he was coughing up 2 oz of purulent, often blood stained, sputum each day Abnormal physical signs were confined to his right upper chest, where the percussion note was impaired and bronchial breath sounds with a few fine râles were heard A radiograph (fig 4) showed consolidation in the upper part of the right lung and in the lateral view this was seen to be mainly in the apical and posterolateral segments of the upper lobe Next day treatment with penicillin, 100,000 units every three hours, was begun This was not followed by any change in his general

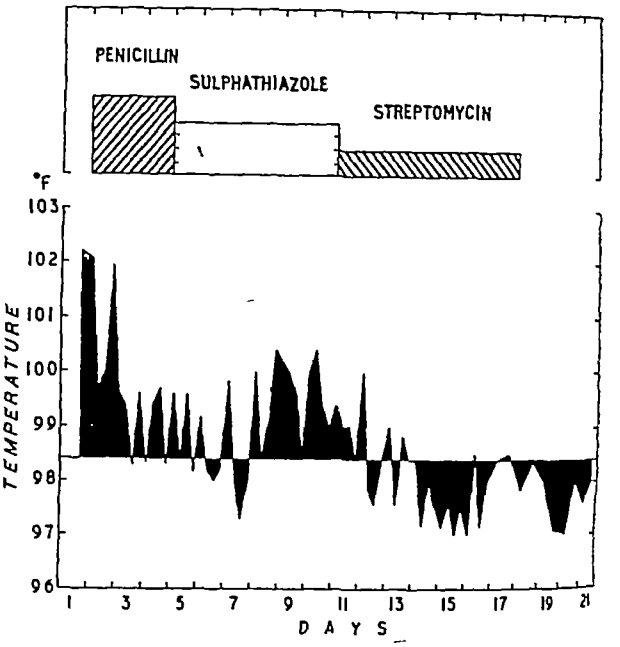


Fig 5—(Case 2) Friedländer's pneumonia temperature chart.

condition, but his temperature fell to 99 6°F After two more days the results of his sputum examination became available and showed the presence of a mixed flora in which Friedländer's bacillus was predominant This organism was isolated from a second specimen of sputum and when injected intraperitoneally in a mouse caused death in twenty four hours It was found to be penicillin resistant, moderately sensitive to sulphonamides, and sensitive to streptomycin

The patient was given a six day course of sulphathiazole. This produced no change in the clinical condition, and a radiograph showed extension of the consolidated area apparently throughout the upper lobe Streptomycin was then started at a dosage of 1 g eight-hourly, and was continued for seven days His temperature-chart (fig 5) shows that the fever rapidly settled, and his clinical condition quickly improved Sputum diminished in amount ceased to be bloodstained, and became tenacious in consistency Tomography (fig 6) showed cavitation in the consolidated area The radiological opacity gradually cleared, and further tomograms three weeks later failed to show cavitation

The patient was discharged, and when seen again a month later he was well and had a normal radiograph

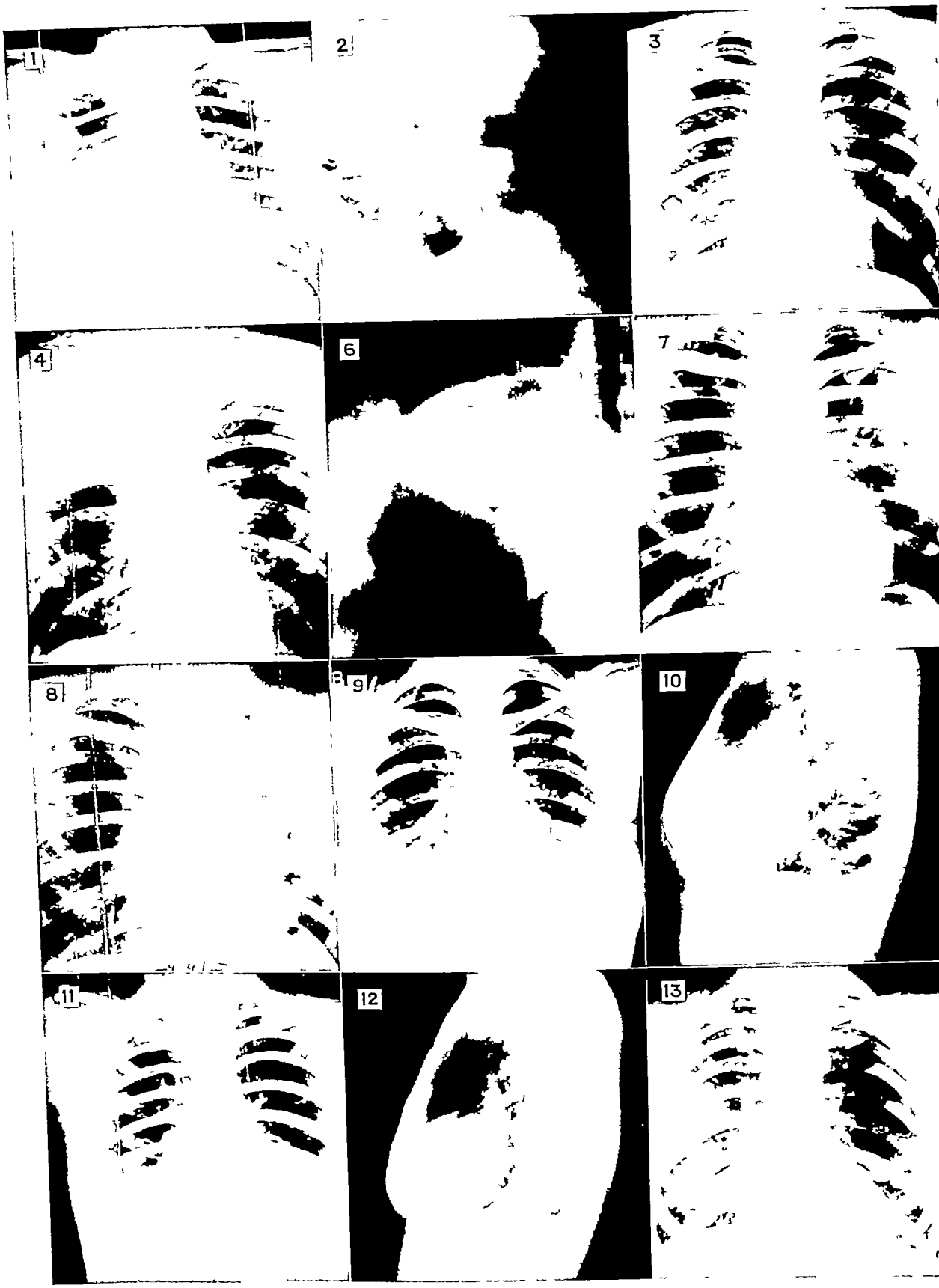
Micro aerophilic Non hæmolytic Streptococcal Pneumonia

Apart from pulmonary tuberculosis, which may be regarded as a specific pneumonia associated with abscess formation, the types described above are the main specific bacterial pneumonias which produce suppurative changes in the lung Possibly, however, more careful bacteriological investigation in cases which are regarded as belonging to the non specific group may show that there are other bacteria which may be specifically invasive for the lungs and capable of causing abscesses The following case is interesting in this connection

Case 3 —A man, aged 33, was taken ill in March, 1947 The onset of the illness was insidious, with a little cough and mucoid sputum and some pain in the left side of his chest He was seen at his local tuberculosis clinic where a radiograph of his chest (fig 7) showed an opacity in the left mid zone He continued to work, but felt increasingly ill and two months later he was coughing up 2 oz of purulent sputum each day Examination of his sputum for the tubercle bacillus was negative He rested at home until September 1947—six months after the beginning of his illness—when he was admitted to the Brompton Hospital Sanatorium

His general condition then was poor His evening temperature was 99°F, and he was coughing up 10–15 oz of thick purulent sputum each day His fingers were clubbed. Radiographic examination (fig 8) showed that the consolidation in the left lung was much more extensive the mediastinum

DR NICHOLSON SUPPURATIVE PNEUMONIA



due to aspiration of infected material or to the lodging of infected blood borne emboli in the lungs The views expressed up to the year 1934 have been well summarised by Maxwell Observations such as those I have quoted in relation to the benign pneumonias associated with catarrhal infections of the respiratory tract, leave little doubt that aspiration of material into bronchi and bronchioles can take place, and that it can produce inflammatory changes in the lung What has been in dispute is whether the aspiration of infected material can by itself produce suppuration and abscess formation, or whether arterial embolism is necessary, either as an accessory or as the primary cause On this point experimental studies in animals have, I think, been inconclusive, some supporting the view that arterial embolism is necessary (e g , Cutler and Schlueter 1926, Herrmann and Cutler 1929, Holman 1926), whereas other workers (Joannides 1928, Hedblom et al 1928) were able to produce abscesses by aspiratory methods alone In man one of the chief objections to the aspiration theory has been the observation that abscesses are commonly situated in the upper lobes Thus, in a series of 25 cases of pulmonary suppuration observed by Logan and myself (Logan and Nicholson 1949), radiographic evidence of the original situation of the disease was available in 22 , and of these the suppurative process involved the upper lobes in 15 instances, 10 on the right side and 5 on the left Such findings have been thought to support the vascular embolism theory, since it was expected that the aspiration of infected material would produce lower-lobe abscesses mainly

Many authors (e g , Touroff and Moolten 1935, Stern 1935) have recorded the frequent association of lung abscess with suppurative processes in the mouth and pharynx, particularly in relation to the teeth and gums, and in the tonsils, and have asserted that aspiration of infected material from these sites is the most common cause of pulmonary suppuration It is, however, to the work of Brock that we owe the clearest exposition of this view and the one most carefully and fully supported by observed facts In 1942, with his co workers, he published an account of experiments in which a small amount of iodised oil was introduced into the trachea with the subject lying on his side or on his back Radiographs taken at suitable intervals showed that the oil came to rest in the posterior and axillary parts of the upper lobe and in the apical segment of the lower lobe These are the commonest sites in which abscesses are found, and, as Brock explains, their localisation in these parts of the lung is easily accounted for by gravity, posture, and the anatomical arrangement of the bronchial tree In subsequent papers (Brock 1947a, b, and c) he has elaborated with a wealth of examples these factors of posture and bronchial anatomy In sleep, during and after anæsthesia, or in coma, the patient is usually horizontal, and it is at these times that conditions are most favourable for inhaling infected material into the bronchi

The distribution of abscesses in the lung may, therefore, be held to support the aspiration theory of their causation The frequent association of pulmonary abscess with suppurative processes in the upper respiratory tract may also be regarded as presumptive evidence in favour of this view The association with tonsillectomy has been recorded in many papers Pinchin and Morlock (1930) found that of their 16 cases, 4 arose after this operation , Fleck and his colleagues (1929) described 172 cases of which 97 followed tonsillectomy , and of 158 cases described by Touroff and Moolten (1935) 25% followed this procedure The importance of dental operations and dental sepsis in relation to the causation of lung abscess has been very clearly shown in the writings of Stern (1935, 1936), who found that of 70 consecutive cases at the Mount Sinai Hospital, New York, 12 followed dental operations In another series of 115 cases, 13 followed dental operations , in this group there were 74 cases in which the ætiology was obscure, but further investigation of these showed that in 84% there were infected gums harbouring debris, anaerobic organisms, and tartar Brock (1947c) has especially emphasised the importance of dental sepsis , and in his series of 316 cases of non malignant lung abscess, gross dental sepsis was regarded as being responsible for 19% Further sources of infected material that have been described include sinusitis, quinsy, and other respiratory tract infections Bronchiectasis is also an occasional cause

The occurrence of lung abscess after abdominal operations has been commonly held to support the view that vascular embolism is the cause Thus, in Maxwell's (1934) series of 199 single abscesses, 38 followed abdominal operations His comment is " that there is an intimate connexion between the occurrences of lung abscess and the presence of sepsis in the operative field, an observation which points to an embolic origin for the majority of cases at least " On the other hand, the frequency with which these abscesses are associated with dental sepsis, and the fact that circumstances during the period of recovery from anæsthesia are ideal for aspiration, make it at any rate equally possible that in the majority of cases this, and not vascular embolism, is the cause

On the whole the evidence supports the aspiration theory, and few who frequently see cases of pulmonary suppuration doubt that in most instances these are due to the inhalation of infected material into the bronchial tree As in the cases of benign aspiration pneumonia described by Ramsay and Scadding (1939), this is followed by occlusion of a bronchus or bronchiole and atelectasis beyond the block The infecting organisms meanwhile produce an acute inflammatory process and suppuration in the airless lung tissue Once suppuration has occurred, the abscesses, either large or small, discharge into the bronchial tree and purulent sputum results.

SUPPURATIVE PNEUMONIAS OF INTERMEDIATE SEVERITY

If, therefore, it be accepted that acute lung abscess and the transient pulmonary lesions associated with respiratory catarrh are both examples of aspiration pneumonia, then it seems reasonable to include in this group a number of pneumonias of varying severity which are commonly seen in the medical wards of general hospitals These may be regarded as occupying an intermediate position between the transient pulmonary consolidations and acute lung abscess I propose to describe briefly three such cases

Case 4 —A woman, aged 21, was admitted to University College Hospital in September, 1949 Previously, apart

LEGENDS TO ILLUSTRATIONS ON PLATE

DR NICHOLSON

Figs 1 and 2—(Case 1) Staphylococcal pneumonia. Postero-anterior and right lateral radiographs showing large abscess cavity

Fig 3—Same case Postero-anterior radiograph showing residual thin-walled cavity

Fig 4—(Case 2) Friedländer s pneumonia. Postero-anterior radiograph showing consolidation in right upper zone

Fig 6—Same case Tomogram showing cavitation

Fig 7—(Case 3) Micro-aerophilic streptococcal pneumonia Postero-anterior radiograph showing consolidation in left mid zone

Fig 8—Same case Postero-anterior radiograph showing extension of consolidation six months after onset

Figs 9 and 10—(Case 4) Aspiration pneumonia. Postero-anterior and left lateral radiographs showing consolidation of middle basic segment of left lower lobe

Figs 11 and 12—(Case 5) Aspiration pneumonia. Postero-anterior and left lateral radiographs showing consolidation of basic segments of left lower lobe

Fig 13—(Case 6) Aspiration pneumonia. Postero-anterior radiograph showing consolidation in right upper lobe

from frequent colds each winter, she had been healthy About a fortnight before admission she had begun to have one of her usual colds, with nasal discharge and slight soreness of her throat After two or three days she began to cough and to bring up a little sputum, which gradually increased in amount On admission she was febrile to 101°F and was coughing up 2–3 oz of mucopurulent, but not fœtid, sputum each day Rib movement was reduced at the left lower chest, and numerous coarse râles were heard at the left base posteriorly Radiographs (figs 9 and 10) taken on the day of admission showed consolidation at the left base, probably in the middle basic segment of the left lower lobe Examination of the sputum showed the presence of a mixed flora, including *Streptococcus pyogenes* and a coliform bacillus

She received sulphamezathine and penicillin, and had postural drainage and coughing under the supervision of a physiotherapist four or five times each day She slept at night with the foot of her bed raised, and as far as possible in a position likely to drain the affected segment Her temperature became normal the next day, and after six days she had only a trace of sputum Radiographs taken ten days after admission showed normal lung fields, and she was discharged well and free from symptoms

Case 5 —In this example, the patient, a woman aged 35, had a similar history of acute respiratory catarrh with cough and the production of 3–4 oz of mucopurulent sputum She was seen as an outpatient at University College Hospital in August, 1949, when radiographs (figs 11 and 12) showed consolidation involving probably all the basal segments of the left lower lobe, with some collapse of these segments On similar treatment she cleared up in a few days, and her radiographs showed normal lung fields In her case also, the sputum contained a mixed flora without predominance of any particular organism

Case 6 —In the third example the patient was a man, aged 52, who was admitted to University College Hospital in May, 1949 He had been well, apart from occasional morning cough, until eleven weeks before admission, when he had had a severe cold with nasal discharge and pains in the limbs He had then stayed away from work for three days, but after his return his nasal catarrh continued and he felt unwell On admission he was in good general condition with a fever to 99°F in the evenings Ten days before he came into hospital he had coughed up about 2 oz of thick pus and had continued after this to bring up a similar amount each day On examination this was not found to be foul smelling, it contained a mixed flora and among other organisms a coliform bacillus and a member of the hæmophilus group were grown He had no abnormal physical signs and was edentulous, his teeth having been extracted many years before A radiograph of his chest (fig 13) showed an area of consolidation, which was in the axillary parts of the antero lateral and posterolateral segments of his right upper lobe Bronchoscopy was carried out and the right upper lobe orifice found to be normal the segmental orifices were patent but covered by mucopus Treatment with postural drainage and chemotherapy was rapidly followed by decrease in the amount of his sputum He was discharged free from symptoms after three weeks His radiographs did not, however, clear completely Six months later, when he was still quite free from cough and sputum, radiographs showed the transverse fissure to be slightly drawn upwards and a small opacity above it, probably due to some fibrosis in the upper lobe

LEGENDS TO ILLUSTRATIONS ON PLATE

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Figs 14 and 15—(Case 7) Acute lung abscess Anteroposterior and right lateral bronchograms showing bronchiectasis of right lower lobe.

Fig 16—Same case: Postero-anterior radiograph showing consolidation in right upper lobe.

Fig 17—Same case: Postero-anterior radiograph taken 14 days after previous one showing abscess cavity in right upper lobe

Figs 18 and 19—(Case 8) Acute lung abscess Postero-anterior and right lateral radiographs showing cavity in right upper lobe.

Figs 20 and 21—Same case Anteroposterior and right lateral bronchograms showing residual linear cavity

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Fig 3—Lateral view of skull showing calcification anterior to and above sella turcica (indicated by arrows)

Fig. 4—Pneumo-encephalograms: A, with head vertical B in supine position.

ACUTE SOLITARY LUNG ABSCESS

For comparison with these relatively benign conditions, I propose to describe two examples of acute lung abscess

Case 7 —In the first, the patient was an Army officer, aged 23, who was admitted to hospital in March 1943, with an acute right sided streptococcal thoracic empyema This was treated and complete re-expansion of his right lung obtained It was clear from his history that he had had a cough, with about 1 oz of purulent sputum each day, from childhood, and he had had frequent episodes of severe respiratory infection. His sputum persisted after the empyema had healed completely Coarse râles were heard over his right lower chest posteriorly Bronchograms (figs 14 and 15) showed dilatation of the right basal bronchi The left bronchial tree was normal In view of his symptoms and the likelihood that the empyema was related to the bronchiectasis, it was decided that he should have a right lower lobectomy He had been severely ill with the streptococcal empyema, and it was thought reasonable to wait a few months before under taking the lobectomy Accordingly, after the bronchograms had been made, he was sent away for six months' convalescence After five months, however, he returned to hospital, very ill, febrile to 102°F, and complaining of pain in the upper part of his right chest posteriorly His sputum had not increased in amount A radiograph (fig 16) showed an area of consolidation which was in the posterolateral segment of the right upper lobe

He was treated with sulphathiazole and postural coughing, but his sputum increased in amount to 4 oz a day, although his general condition improved and the fever settled Examination of the sputum, which was not fœtid, showed the presence of a mixed flora, including pneumococci, staphylococci and *Neisseria catarrhalis*, repeated examinations were negative for tubercle bacilli A radiograph (fig 17) taken a fortnight later showed that the area of consolidation had apparently broken down and an abscess cavity had appeared This was drained externally, and after healing had taken place bronchography was repeated This showed some distortion of the posterolateral branch of the right upper lobe bronchus, the bronchiectasis of the lower lobe remained evident, and there can be little doubt that pus was aspirated from the lower lobe into the posterolateral segment of the upper lobe and produced the abscess

After having been well for two months, but still bringing up 1 oz of purulent sputum each day, he returned to hospital He was again very ill, febrile, with profuse sputum, and his radiographs once more showed an abscess cavity in the posterolateral segment of the right upper lobe This was drained, but he died of cerebral suppuration

Case 8 —In the second example, the cause of the abscess was apparently dental and gingival sepsis The patient was a Royal Air Force officer, 44 years old, who was admitted to hospital in December, 1942 He was severely ill febrile to 103°F, and coughing up 4 oz of foul smelling purulent sputum each day He had been living in conditions of considerable hardship for several months, and had become gradually ill over the three weeks before his admission

On examination his fingers were clubbed, there was an impaired percussion note and numerous coarse râles were heard over the upper part of his right chest Radiographs showed a large abscess (figs 18 and 19) occupying most of his right upper lobe This was drained externally His symptoms were immediately relieved and he rapidly became afebrile and well It was three months, however before the abscess cavity was regarded as having healed and the drainage wound allowed to close Bronchograms (figs 20 and 21) three months later showed that in fact, a small linear cavity remained in communication with the bronchial tree Because of its situation, it seemed likely that its drainage would be satisfactory The patient was well and free from cough and sputum

It seems reasonable to regard such conditions as these that I have just described as aspiration pneumonias In the three more benign instances the pneumonia followed a respiratory catarrhal infection, and the suppurative process which resulted was relatively mild and was overcome before demonstrable abscesses were produced In the other two examples large abscess cavities were formed, presumably because of the more virulent nature of the invading organisms or the impaired resistance of the patient In the first of these the organisms were

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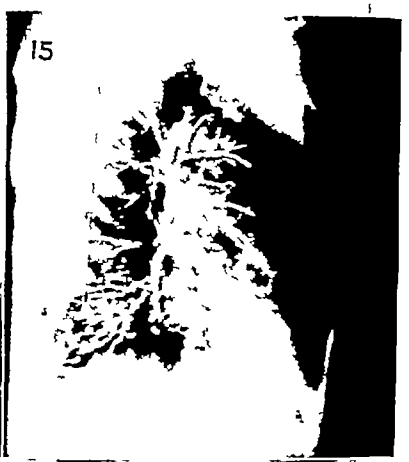
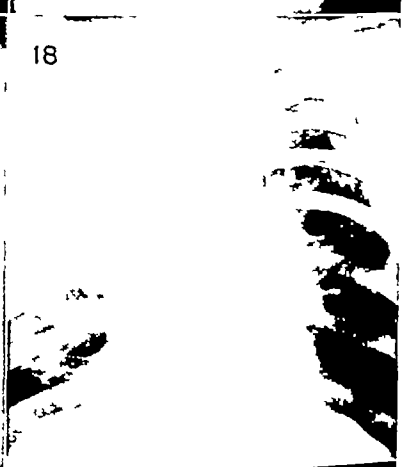
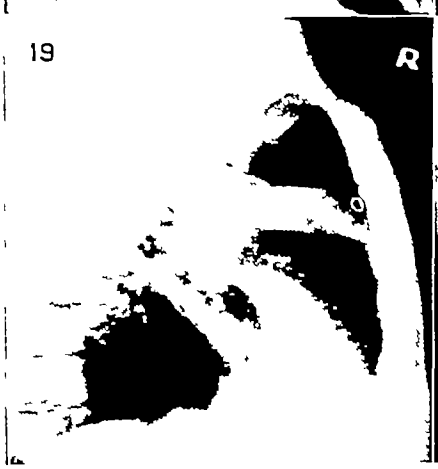
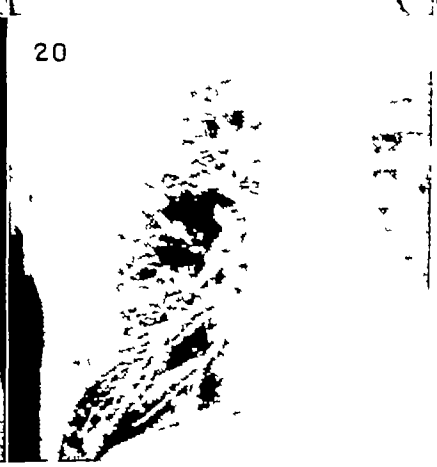
SUPPURATIVE PNEUMONIA









DR FARQUHAR CONGENITAL TOXOPLASMOSIS

Fig 3

A B

Fig 4

RHEUMATOID ARTHRITIS

PARTIAL REHABILITATION BY INTERVAL THERAPY WITH A C T H AND CORTISONE*

ROBERT E STONE †
M D Harvard
ASSOCIATE PROFESSOR, DEPARTMENT OF NUTRITION AND METABOLISM, ASSOCIATE DIRECTOR, NUTRITION CLINIC

TOM D SPIES
M.D Harvard
PROFESSOR AND HEAD OF DEPARTMENT OF NUTRITION AND METABOLISM, DIRECTOR, NUTRITION CLINIC

WILLIAM NIEDERMEIER
B S Purdue
ASSISTANT IN THE DEPARTMENT AND THE CLINIC

From the Department of Nutrition and Metabolism, Northwestern University Medical School, Chicago, Illinois, and the Nutrition Clinic, Hillman Hospital, Birmingham, Alabama

THE administration of either pituitary adreno corticotropic hormone (A C T H) or synthetic 'Cortisone' acetate produces a striking amelioration of symptoms in patients with rheumatoid arthritis (Hench et al. 1949, Thorn et al 1949, Markson 1949, Spies and Stone 1949, Spies et al 1949, Ragan et al 1949, Sprague et al 1950) The major therapeutic effect of A C T H on human beings is caused by the steroid hormones which are produced when it stimulates the adrenal glands Some of these hormones are closely related to cortisone With other investigators, we suspect that the administration of large amounts of A C T H to human beings over long periods may be harmful through excessive stimulation

Cushing's syndrome, associated with hyperplastic or neoplastic adrenal cortices, was described before cortisone and A C T H were administered in large amounts to man It is characterised by acne, hirsutism, amenorrhœa in females, mental symptoms, raised blood pressure, alkalosis, cutaneous striæ, negative nitrogen balance, decreased carbohydrate tolerance with glycosuria, and decrease in circulating eosinophils Certainly these symptoms tend to follow either the administration of large amounts of cortisone over a long period, or pro tracted therapy with A C T H, owing to the over production of cortisone and cortisone like hormones by the adrenal cortex. In some patients with Cushing's syndrome arising from a tumour of one adrenal cortex there is atrophy of the other adrenal cortex The atrophy of the contralateral adrenal cortex is presumably a result of the overproduction of cortisone or a cortisone like substance from the neoplasm Accordingly it is reasonable to assume that the administration of large amounts of synthetic cortisone for a long time may result in some degree of atrophy of the adrenal cortex.

Since rheumatoid arthritis is often a debilitating disease, and since either A C T.H. or cortisone ameliorates the acute symptoms, it seemed worth while to attempt to rehabilitate a group of patients in whom the disease was active and the resulting disability great We decided to give each patient a series of injections of A C T H and on another occasion to give the same patient a series of injections of cortisone, the rationale being that one of these hormones overstimulates the adrenal cortices and the other tends "to put them to sleep" Because of their scarcity we could not give these materials at regular intervals When the patients had acute symptoms and neither A C T H nor cortisone was available, we gave them injections of pregnenolone acetate (5 pregnene 3 beta ol-20 one 3 acetate), deoxy cortone acetate (DOCA) and ascorbic acid, physiological saline solution, or acetylsalicylic acid In no case did pregnenolone acetate, deoxycortone acetate and ascorbic acid, saline solution, or acetylsalicylic acid give relief, whereas both A C T H and cortisone were definitely beneficial Though the patients are still under study, their disability has decreased sufficiently to enable them to work

MATERIAL AND METHOD

From a large group of patients with rheumatoid arthritis who had been under observation in the Nutri tion Clinic we selected four men and three women We excluded patients with mild arthritis or those who had ankylosis of the weight bearing joints or the joints of the hands and fingers The seven patients selected fulfilled the following criteria (1) severe physical handicap to an extent that they could not function with out the assistance of others, (2) swollen painful tender joints, (3) a loss in body-weight and a distaste for food, (4) characteristic radiological evidence of arthritis, (5) a raised erythrocyte sedimentation rate, (6) anæmia characterised by 80% hæmoglobin or less, and (7) normal uric acid level in the blood To rule out those who might benefit from the administration of salicylates either orally or parenterally each patient was given an initial dose of acetylsalicylic acid grains 10 t i d, and the amount was increased until salicylism developed or gr 100 had been given in twenty four hours If the patients experienced no relief, and if no changes were detected in the physical examination or laboratory investigation, each patient was given 1 0 gramme of sodium salicylate intravenously daily for three days, followed by 2 0 g daily for three days Patients who experienced relief of symptoms and some decrease in swelling were not included in the study The seven who were selected finally were chosen because they seemed to be unusually determined to fight their disease and because they felt it necessary to resume a normal life They were told that they would be subjects of an investigation, that they would not know what medication they were receiving, and that irrespective of the results obtained their treatment would be changed from time to time

In the treatment of many patients with either A C T H or cortisone for malignancy, Hodgkin's disease, acute leukæmia, lymphosarcoma, or lupus erythematosus we have often found it necessary to administer very large doses of one or the other substance week after week to maintain life, with the result that we have had a rather broad clinical experience of the physiological responses to cortisone or A C T H given in massive doses (Spies et al. 1950) With this experience in mind we carefully sought any evidence of humoral effect in this series of patients Each patient went through the following periods of observation

1 Effect of frequent injections of physiological saline solution.
2 Effect of frequent injections of A.C T H in saline solution
3 Effect of sterile pregnenolone acetate in benzyl alcohol and saline solution
4 Effect of acetylsalicylic acid orally and parenterally
5 Effect of deoxycortone acetate and ascorbic acid with low sodium diet
6 Effect of acetylsalicylic acid
7 Effect of synthetic cortisone acetate
8 Effect of parenteral deoxycortone acetate and parenteral ascorbic acid without restriction of sodium in diet
9 Effect of synthetic cortisone acetate
10 Effect of A C T.H

Each of these periods of study included several days of observation before, during, and after the administration of each of the materials Blood-pressure, pulse rate, and body-weight were determined daily In

* This study was aided by grants from the Birmingham Citizens Committee Fund and from the Clayton Foundation The pituitary A.C T H was furnished by Dr John R. Mote of Armour Laboratories and by Dr Kenneth W Thompson, of Organon Inc The synthetic cortisone acetate was furnished by Dr James M. Carlisle of Merck & Co Inc
† Clayton Foundation fellow

probably carried in pus from bronchiectasis in another lobe, and the patient had not long recovered from a severe thoracic empyema In the second the organisms were thought to have been carried in material from infected gums while the patient was subjected to hardship in the course of his duty In the first the sputum was never at any time foul smelling, while in the second the patient coughed up fœtid pus This possibility of classifying pulmonary suppuration in fœtid and non fœtid groups has engaged much attention in the past twenty years, and I should like to consider briefly its significance

FŒTID AND NON-FŒTID TYPES

Touroff and Neuhof (1941) emphasise the importance, as far as prognosis and treatment are concerned, of separating pulmonary suppuration into fœtid and non-fœtid types It is doubtful whether this distinction can be made with any degree of accuracy Brock (1947a), who uses these two types as being convenient in classification, states that the figures he gives for fœtid and non fœtid abscesses are not "more than approximately accurate, the margin of error either way being possibly as much as 10 per cent" Further, he points out the difficulty of deciding from the patient's account of his symptoms whether or not the sputum has at any time been foul smelling In the series of 25 cases of chronic pulmonary suppuration observed by Logan and myself (Logan and Nicholson 1949), fœtor of the sputum was found to come and go, and was present at some time during the course of the disease in all but 4 cases Similarly, Sellors and his colleagues (1946), in a series of 27 cases of chronic pulmonary suppuration, noted that in all but 6, the sputum was fœtid at some time during the illness In Brock's paper the fœtid and non fœtid groups are considered in relation to prognosis He found that a series of 238 cases could be divided into 126 in which the sputum was fœtid and 112 in which it was not In his study of these groups he stated that it was not his experience "that spontaneous resolution, with low morbidity and low mortality, and without serious permanent secondary changes in the lungs, is substantially more frequent in the group as a whole than in the fœtid group"

In relation to treatment it seems equally difficult to maintain any need to attempt this distinction Thus, Touroff and Neuhof, although claiming that a fœtid abscess should be treated by early external drainage while a non fœtid abscess should be treated conservatively, do regard one variety of the non fœtid group—namely, that which consists of a solitary abscess without surrounding inflammatory changes—as often requiring surgical drainage The same principle has, in fact, commonly been applied to the fœtid group (Brock 1948b, Shaw 1942), and it seems that the fact that the abscess cavity is solitary and uncomplicated by surrounding inflammatory changes may indicate surgical drainage, irrespective of whether or not it is regarded as fœtid

AEROBIC AND ANAEROBIC ORGANISMS

It has long been known that the fœtid sputum of patients with lung abscess can be shown to contain spirochætes and fusiform bacilli (Leyden and Jaffe 1867, Ronn 1905) The relation of these organisms to the pathogenesis of lung abscess has been much disputed, and Maxwell (1934), in his summary of the bacteriological findings in lung abscess up to 1934, concludes that the condition can arise "from infection with one or more of a variety of organisms," and "the specificity of the spirochætes and other anaerobic organisms" cannot be regarded as proved Nevertheless, the work of D T Smith (1927, 1932) leaves little doubt that, in certain cases at any rate, anaerobic spirochætal organisms are responsible for the production of lung abscess He demonstrated the presence of these organisms in the sputum and in the cavity walls of abscesses, and in addition produced abscesses in animals by the intratracheal injection of mixed cultures of these organisms He also demonstrated their presence around the teeth of persons suffering from pyorrhœa, and he produced pulmonary abscesses in laboratory animals with material scraped from such teeth On the other hand, pulmonary suppuration frequently occurs in the absence of dental sepsis, and the sputum of patients with lung abscess is almost as frequently non-fœtid as fœtid Moreover, on culture of the sputum from cases of lung abscess, it is usual to find a mixture of aerobic organisms of the varieties commonly found in the mouth and upper respiratory tract (e g, Bucher 1930), these organisms may often be the cause of the suppuration, but even in cases where suppuration is caused by anaerobes, once the abscess has ruptured into the bronchial tree conditions must encourage aerobic growth Thus, I think that if the view be taken that there is a range of localised aspiration pneumonias from the most benign through varying degrees of suppuration to cases in which extensive abscess formation is an early feature, then it is likely that many of the more severe types are caused by anaerobic organisms These are often soon overgrown because of the development of aerobic conditions During the course of protracted pulmonary suppuration local conditions in the lung may from time to time encourage the growth of anaerobes, so perhaps accounting for the observation that foul sputum is a variable feature of such suppuration In any case, it seems impracticable to distinguish fœtid and non fœtid types of non specific pulmonary suppuration, and as far as prognosis and treatment are concerned it does not seem important

Pulmonary suppuration, once established, may progress as a chronic disease In surveying non-specific suppuration, I have been concerned mainly with putting forward a unified view of its development In the same way I regard the chronic phase as essentially a single entity In most reports which refer to the chronic phase, an attempt is made to distinguish between chronic fœtid and chronic non fœtid abscess As Brock (1947a) points out, chronic suppuration in both groups "carries the same grave ultimate prognosis", and in fact, for reasons which I have given, I do not believe it possible to make the distinction with any accuracy Further, cases which at their onset present as solitary abscesses do not differ materially in their chronic course from those which begin as a mainly pneumonic process (Logan and Nicholson 1949)

(To be concluded)

"Much too much has been said about the training of the *medical student* Much too little about the training of the patient Nothing, in fact This country still hasn't got a Royal College of Patients A single glance over the assembled crowd in Out Patients' Department should suffice to classify patients into two distinct groups amateurs and professionals Both groups are waiting But there is a world of difference between them Professional patients develop their symptoms gradually and with the tender care of a French chef preparing a major dish Amateur patients keep on acquiring new symptoms and losing old ones as if they were fountain pens or library books Professional patients will start their past history by remarking that they were eight-months babies Amateur patients may remember having spent three months in hospital the previous year, but they can rarely tell whether the trouble was in their chest or in their tummy And they will insist that neither could the doctors Amateur patients have large and healthy families Professional patients have never had time Professional patients regard it as the highest aim of the medical profession to get them into hospital Amateur patients naively but firmly believe that it is to get them out of it."—T L D *Magazine of the Royal Free Hospital School of Medicine*, 1950, 12, 56

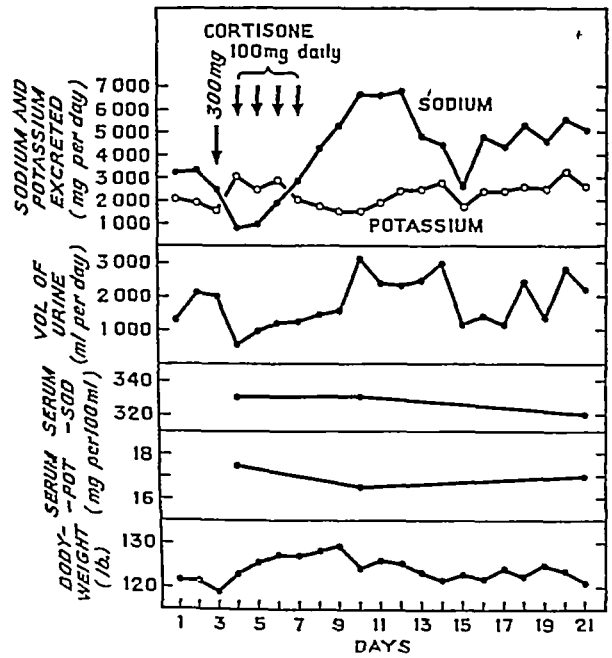


Fig 2—Effect of cortisone on electrolyte pattern in rheumatoid arthritis.

acetate and ascorbic acid injections at the same time, and to restrict him to a diet containing not more than 200 mg of sodium chloride After he had been on the diet for two days he was given deoxycortone acetate 10 mg intramuscularly and ascorbic acid 1 g intravenously daily for four days At the end of this time the ascorbic acid was discontinued, but the deoxycortone acetate was given in the same dosage for fourteen more days This therapy gave no relief whatever from the pain and stiffness of the joints The patient did not develop œdema at any time The B.P increased slightly, ranging between 134/80 and 136/84 whereas before this treatment it had ranged between 118/78 and 144/72 The electrolyte pattern during this treatment is shown in fig 1

Effect of Acetylsalicylic Acid—For the following six weeks he was given enough acetylsalicylic acid to keep him fairly comfortable, and he continued to work steadily although his joints were stiff and he had difficulty in moving During this time the laboratory findings remained essentially the same as they had been at the time of the initial examination The acetylsalicylic acid was discontinued for two weeks, and during this time the aching of the feet legs knees, shoulders, and hands became moderately severe The findings from a physical examination at this time were similar to those before A.C T H therapy

Effect of Cortisone Acetate—He was given cortisone acetate 300 mg intramuscularly one day and then 100 mg daily for four days After the first day of therapy he felt decidedly better he slept all night had only slight pain in his joints, and had almost lost his stiffness He continued to improve, and by the third day of therapy he could move with ease and was sleeping and eating well The pain in his joints decreased greatly although it was not completely relieved On the fifth day of therapy he developed pitting œdema of the feet and he weighed 8 lb more than at the start of treatment The cortisone injections were then discontinued There was no significant change in the other laboratory findings except that the B.P had increased from 124/76–132/80 before treatment to 164/80–166/90 during cortisone therapy The œdema of the ankles disappeared slowly and three weeks after the cortisone was discontinued his body-weight returned to the initial level The electrolyte pattern during treatment with cortisone acetate is shown in fig 2

Further Treatment—Three weeks elapsed without therapy and during this time the stiffness of the joints gradually returned and the aching became more severe but the patient went on working At the end of this time he was given deoxycortone acetate 10 mg intramuscularly and ascorbic acid 1 g intravenously daily for four days, followed by deoxycortone acetate 10 mg alone for five days This gave no relief Sodium chloride was not restricted during this period of therapy with deoxycortone acetate and ascorbic acid as it had been during the first period three months previously He developed œdema of the hands and ankles and gained 7 lb in weight whereas previously when the salt intake was restricted while these drugs were being administered, œdema had not developed The B.P increased from 126/70 before therapy to 150/70 after administration of deoxycortone acetate and ascorbic acid

After the deoxycortone acetate had been discontinued, no therapy of any kind was given for four days By the end of this time there was intense pain in all the affected joints The administration of cortisone acetate 300 mg intramuscularly one day and 100 mg on each of the three succeeding days again gave prompt relief In the six weeks that have since elapsed he has had a series of six injections of A C T H 100 mg, and two weeks later another series of four injections of 50 mg each Each time the aching and stiffness of his joints were relieved and each time they returned after therapy was discontinued Nevertheless the severity of the pain has been relieved sufficiently to enable him to continue working regularly as a machinist

SUMMARIES OF THE OTHER CASES

Case 2—A white housewife, aged 31, had had psoriasis for twenty two years and severe rheumatoid arthritis for ten years The psoriasis had appeared first on the scalp and seven years later on the chest and abdomen The lesions had almost cleared for various periods of time the longest having been during her first pregnancy when swelling of her left thumb first developed Gradually the joints of both hands and feet had become involved Vitamins, hot baths and salicylates had not relieved the arthritis and the psoriasis had not been benefited by sulphonamides and various ointments For nearly a year she had been unable to do her housework without assistance

On examination the joints of the hands and feet were all enlarged and tender There was moderate limitation of movement in the hands and feet and the fingers were partially flexed Numerous psoriatic lesions on the abdomen, sacrum, lower back and upper cervical regions were elevated, red, and scaling

Treatment—In the past year she has received A C T H 375 mg in 7 days, also cortisone 700 mg in 5 days, and 2250 mg in 36 days (total 2950 mg)

Results—Three days after beginning treatment with either A C T H or cortisone acetate there was less redness, itching, scaling, and induration of the psoriatic lesions Within the next day the tenderness and swelling of the joints began to subside She could use her hands and walk better than she had done for years The skin lesions continued to subside although they did not clear completely After each period of therapy she has been able to do all her own housework

During the 36-day period of treatment the cortisone was given as follows 300 mg the first day, 100 mg daily for four days, and 50 mg daily for 31 days At the somewhat higher dosage the patient's appetite increased tremendously, she ate breakfast for the first time and consumed much more food for the other meals than she had before treatment Even after the dose was decreased to 50 mg daily she continued to have an excellent appetite She gained 8 lb in weight and maintained this weight for many weeks Her good appetite persisted even after the end of therapy There did not seem to be any abnormal distribution of body fat, and there was no œdema. After this period of therapy she became disturbed about a delayed menstrual period

The B P and body weight increased slightly during therapy, but no clinical evidence of pitting œdema developed They returned to the initial level soon after therapy was discontinued The circulating eosinophils decreased from 102 to 0 per c.mm by absolute count four hours after the administration of 25 mg of A.C T H The corrected E.S.R decreased from 24 mm in one hour to 15 mm in one hour in 14 days, after the administration of 875 mg of cortisone acetate

Case 3—A white housewife aged 42 had had severe rheumatoid arthritis involving the jaws shoulders hands, wrists knees ankles and feet for seven years At first she had occasional pain in her joints Gradually the pains became more frequent and more severe Eighteen months before we first saw her she had begun to have severe pain and swelling of all the affected joints Salicylates had given only slight relief There was severe limitation of movement in the wrists ankles and knees She could walk only with

each case all the urine passed in twenty-four hours was collected and measured Frequent blood studies throughout each period included red-cell counts, differential leucocyte counts, hæmatocrit determinations, and erythrocyte sedimentation rates (E S R) In addition, the following chemical analyses were made at short intervals non protein nitrogen (N P N), sugar, uric acid, cholesterol, serum-protein, and albumin/globulin ratio The urinary excretion of sodium and potassium and the blood sodium and blood potassium levels were determined before, during, and after each material was administered These analyses were done with a Perkin Elmer model 52 A photometer by the internal standard technique (Bills et al 1949)

AN ILLUSTRATIVE CASE

Case 1 —A machinist aged 65, had had crippling arthritis for nine years His father had rheumatism, his wife had had arthritis for ten years, and his only child a daughter now aged 40, had had arthritis for two years Except for whooping-cough and influenza he had had no serious illness and he denied any allergy He had had excellent health until 1941, when he developed pain and stiffness in his neck. These attacks lasted several days, were often associated with cold damp weather, and recurred rather frequently, but there was no tendency to spread until 1945, when pain, swelling, tenderness, and stiffness began in the hands, elbows, shoulders, knees, ankles, and feet Soon after this the patient noticed deformities and limitation of movement in his joints, he became weak and lost his appetite From that time he had never had a full remission of the arthritis, though on some days his joints were less painful, the disease was progressing slowly and steadily Many types of therapy, including salicylates, had been tried, but without real benefit

Physical examination showed a rather small, moderately well built and somewhat emaciated man obviously suffering great pain in the joints of the hands, arms, legs, and hips. It was almost impossible for him to rise from a sitting position, walk, or change his clothes

The tone and texture of his skin were good except over the involved joints, where the subcutaneous tissue was thickened There was a heavy growth of hair normally distributed over the body The lymph nodes in all areas were palpable, varying in size from a few millimetres to 1 5 cm in diameter, they were firm and not tender The lungs were resonant, a few inconstant sibilant râles were audible at the bases The heart was normal in size, rate and rhythm, no murmurs were heard The blood pressure (B.P) was 150/80 mm Hg The abdomen was scaphoid, the liver and spleen were not palpable

There was moderate dorsal kyphosis, with slight limitation of the cervical spine in all directions Enlargement or swelling, deformity limitation of movement, tenderness, and weakness were present in the hands, wrists, elbows, shoulders, knees, ankles, and feet, the hands being the most severely, and the ankles and shoulders the least severely, affected The fingers were deviated to the ulnar side and could not be completely flexed or extended There was some general muscle atrophy, and there was extensive atrophy of the intrinsic muscles of the hands, the radial group of the fore arms, and the extensor group of the thighs There was increased fluid about the knee joints, particularly about the anterior aspect

Three or four firm slightly tender subcutaneous nodules were found on both the plantar and dorsal aspects of the fingers and the thumbs, the second and third fingers of both hands were particularly swollen There were larger softer multilocular nodules over each olecranon, and firm slightly tender nodules over the upper portion of each ulna, over the heels over the medial aspect of the first metatarso phalangeal joints and over the dorsum of three or four toes of each foot The patient moved slowly and with difficulty from a sitting to a standing position and he walked with a wide base short steps and apparently little movement at the knees and ankles

Laboratory Findings —The E S R was 50 mm in one hour (corrected 38 mm in one hour) Examination of the blood showed N.P N 27 mg, sugar 68 mg, cholesterol 78 mg (esters 50 mg, free 28 mg), uric acid 1 70 mg and total protein 6 5 g per 100 ml (albumin 4 35 g globulin 2 30 g albumin/globulin ratio 1 90/1) red cells 4 720,000 per c.mm, white cells 6100 per c mm (polymorphs 78%, eosinophils 3%, lymphocytes 8%, myelocytes 11%), Hb 12 6 g per 100 ml (82%), reticulocytes 1 9%, packed cell volume 40·5%, mean corpuscular hæmoglobin 27%, mean corpuscular hæmoglobin concentration 31%

Radiography showed demineralisation of the bones, particularly of the hands and feet, with narrowing of the joint spaces and obvious deformities

Effect of Saline Solution —The patient was given 1 ml. of physiological saline solution intramuscularly twice daily for four days without relief of the stiffness and aching of the joints.

Effect of Pregnenolone —Likewise, he obtained no relief from pregnenolone acetate 300 mg by mouth daily for two weeks

Effect of A C T.H —Next, without his knowledge, he was given A C T H 15 mg intramuscularly four times daily for four days Four hours after the first injection of A.C.T.H. he volunteered that the aching and soreness of his hands had almost disappeared, that he could open and close his hands with comparative ease, that the stiffness in his knees had disappeared, and that he had walked up four flights of stairs without difficulty On rising in the morning after the second day of therapy he felt better than he had for three months He threw back the bed covers without delay and got right up, whereas, before treatment with A.C.T.H., it took him five or ten minutes to get from under the bed covers and from ten to fifteen minutes to get out of bed. By this time he appeared rested, his colour was good, and he could move with ease even in full motion, and his gait was normal He continued to feel better than he had since the onset of his illness until the third day after the injections of A C T H were discontinued, when he began to have slight pain in his joints That night the pain woke him twice, and in the morning his hands were slightly swollen and stiff and he could not close them so easily as on the previous day He noticed also that he had less freedom of movement. He was given injections of saline solution for four days, and at the end of this time the aching and stiffness of his joints continued though they never became so severe as they had been before A C T H therapy He then was given acetyl salicylic acid in amounts up to gr 45 daily for four months, during which time he was moderately comfortable and able to continue working

Effect of Deoxycortone Acetate and Ascorbic Acid —At the end of this time it was decided to give him deoxycortone

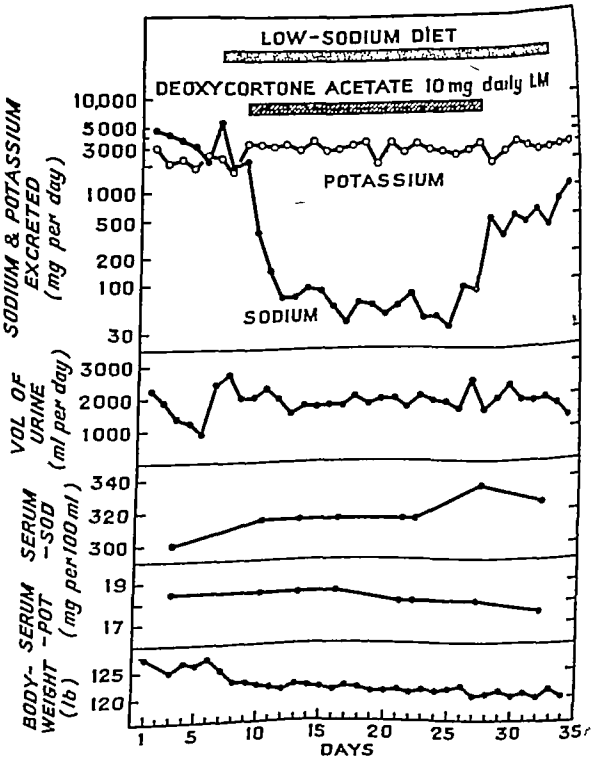


Fig 1—Effect of deoxycortone acetate on electrolyte pattern of a patient on low-sodium diet.

Treatment—Within the past year he has had A.C.T.H. 187 mg. in 5 days, 200 mg. in 7 days, and a single dose of 25 mg. (total 412 mg.); also cortisone 1650 mg. in 10 days.

Results—The administration of either A.C.T.H. or cortisone acetate was followed by a dramatic improvement within 24–48 hours. On the second day of treatment he could easily rise from a sitting position unaided and could walk rapidly and without pain, and the swelling of the joints disappeared. Within a week from the start of treatment the nodules were smaller and less painful and the lymph nodes were less swollen. During the initial period of therapy he had a remarkable increase in appetite and gained weight progressively without developing any clinical evidence of œdema. His excellent appetite and weight gain continued after treatment was discontinued. His weight at the beginning of therapy was 140 lb.; four months later it was 156 lb. He had no appreciable symptoms for two and a half months after treatment with A.C.T.H., and no disturbing symptoms for four months. During this time he could do the long and difficult laboratory work required of a junior student majoring in chemistry. Five months after A.C.T.H. therapy he gradually began to lose appetite and weight, and was slowed down in all his activities until he returned home for vacation, and treatment could be resumed. Despite his symptoms he completed a full year's work. During the second period of therapy when he was given cortisone he again responded promptly.

There was essentially no change in B.P. throughout therapy, and no evidence of pitting œdema. The circulating eosinophils decreased from 1046 per c.mm. to 0 by absolute count four hours after the injection of 25 mg. of A.C.T.H. The corrected E.S.R. decreased from 43 mm. in one hour to 11 mm. in one hour in 10 days after the administration of 1650 mg. cortisone acetate intramuscularly.

DISCUSSION

After the withdrawal of treatment with A.C.T.H. there was a fairly prompt diuresis with loss of œdema in the patients who developed œdema, and the electrolyte pattern returned rapidly to the pre-treatment level. In general, the response to cortisone was a little slower than to A.C.T.H., after the cortisone was discontinued, the electrolyte pattern returned to normal much more slowly, there was no great diuresis, and the loss of œdema was much slower. The pattern of symptomatic relief was essentially the same after the administration of either of these materials; it was characterised by a decrease in stiffness, an increase in range of movement at the joints, a decrease in pain and tenderness, swelling, weakness, and fatigability, and an improvement in appetite. Perhaps the earliest objective indication of a favourable response was the change in facial expression and colour. Before treatment all the patients appeared fatigued, dejected and pale. A favourable response was invariably accompanied by an alert expression and what seemed to be a vasomotor reaction manifested by an increased pinkness of face and hands. The reverse applies to a developing relapse; a pallor develops which is not related to anæmia and an appearance of fatigue is observed.

An increase in appetite and food intake invariably accompanied the beginning relief of symptoms, and in each case there was a gain in body-weight. Rounding of the face or "moon face," did not develop in any of the patients. None of them developed cutaneous striations, acne or hallucinations. None of the females developed hirsutism or amenorrhœa. Three patients developed what might be termed euphoria; they were mentally more active than usual and did not sleep well. These symptoms promptly regressed when the administration of cortisone or A.C.T.H. was discontinued.

In each patient the daily injections of deoxycortone acetate, and in five cases the daily injection of cortisone or A.C.T.H. led to pitting œdema, an increase in systolic and diastolic blood pressure, and retention of sodium in the blood and tissues when the diet was unrestricted in sodium. (Deoxycortone acetate seems to be about twenty times as effective per unit of weight as cortisone in producing sodium retention.) When deoxycortone acetate, A.C.T.H., or cortisone therapy was discontinued, the sodium retention and the œdema disappeared, and the blood-pressure returned to the initial level. The administration of these drugs in the same amounts while the diet was low in sodium content was not followed by œdema, increase in blood pressure, or sodium retention. The symptoms were relieved after the administration of either A.C.T.H. or cortisone regardless of whether or not the sodium content of the diet was low. (Detailed chemical findings of the sodium and potassium study will be reported separately.)

There are changes in the plasma electrolyte pattern and in the urine which vary with the dosage of A.C.T.H. and cortisone, the length of time they are administered, and the patient. Our preliminary findings are in keeping with those of others in that they suggest that a negative nitrogen balance tends to develop during the administration of A.C.T.H. and cortisone. Often there is a slight increase in uric acid in the urine, an elevation of the blood sugar level, and a tendency for the serum albumin and serum-globulin levels to change toward normal. Asthenia was observed in several patients after the withdrawal of these materials.

Though we used various dosages of cortisone, our tentative recommendation for an adult is a dose of 100 mg. three times a day the first day, 100 mg. twice a day the second day and until there is some amelioration of symptoms, and thereafter 100 mg. daily until the symptoms are fairly well under control. Then, 50 mg. a day is given to determine if this amount is adequate. We prefer to administer not more than a total of 2·5 g. and then to allow an interval without therapy. In the treatment of an adult with rheumatoid arthritis with A.C.T.H. we prefer to give a daily dosage of 60–100 mg. divided into three or four equal doses and injected every six or eight hours until the patient shows definite improvement, which usually happens on the second or third day. Then the daily dosage can be reduced to about half. We prefer to give not more than a total of 1·5 g. before allowing an interval without therapy. We are studying maintenance therapy with A.C.T.H. in one series of patients and cortisone in another series, in an attempt to find how much the necessary dosage varies from case to case.

The seven patients are partially rehabilitated. One, aged 21, attends a university; one of the men works as a machinist; and one can oversee the work in his small store. The fourth man is a retired bridge construction worker who has not worked for a number of years but can now go fishing. The three women can do their own housework. It cannot be said of any of them that they are in perfect health or that they are free from symptoms. The administration of A.C.T.H. or cortisone was always discontinued before they were entirely symptom-free; the sedimentation rate was still slightly raised, and occasional twinges of pain in some joints persisted. We worked on the theory that the changes of humoral toxicity were greatly decreased if treatment were given periodically and never for a long time. The mere fact that the patients can walk and do light work probably means that they have less muscle atrophy than they had when treatment was started. Had they not been treated, it seems likely that each of these seven patients would have been confined to bed or to a wheel-chair.

There is no evidence that the fundamental progress of rheumatoid arthritis has been cured by A.C.T.H. or cortisone therapy, nor is there any suggestion that these materials will cure the disease. There is evidence, however, that the course of the disease is favourably influenced. We are certain that none of the patients are any worse, and we are equally certain that they have obtained temporary remissions. In view of the undesir-

great difficulty and could not rise from a sitting position without aid For over a year she had been unable to comb her hair She spent all day doing housework that had required not more than four hours before her illness

Treatment—Within the past year she has had ACTH 695 mg in 9 days, 64 mg in 2 days, 175 mg in 5 days, and 275 mg in 10 days (total 1209 mg) She has also had cortisone 1250 mg in 5 days, 1000 mg in 8 days, 1050 mg in 6 days, and 1850 mg in 13 days (total 5150 mg)

Results—The administration of either ACTH or cortisone acetate was followed by striking relief of pain the day after the initial dose She could comb her hair, rise from a sitting position without help, and walk with ease The swelling of the joints gradually subsided After each period of therapy she has been able to do her housework in about half the time it required previously There was a very slight increase in B.P after treatment, and the body weight increased slightly, but there was no clinical evidence of pitting œdema The B P and body weight returned to the initial level soon after therapy was discontinued The circulating eosinophils decreased from 105 to 84 per c mm by absolute count four hours after the injection of 25 mg of ACTH The corrected ESR decreased from 65 mm in one hour to 24 mm in one hour in five days, after the administration of 1250 mg of cortisone acetate intramuscularly

Case 4—A white housewife, aged 58, had severe rheumatoid arthritis involving nearly all her joints Transient pains in the joints had begun seven years before we saw her, and in the first five years she had had several remissions For two years the pain and stiffness had become progressively worse, until she could not rise from a chair, turn over in bed, comb her hair, or dress herself For six months she had been unable to wear shoes, because of the pain and swelling in her feet Vitamins, sedatives, and salicylates had given no relief Her feet, ankles, wrists, and elbows were so swollen that examination was difficult For six weeks she had been unable to do her own housework

Treatment—In the past year she has received ACTH 240 mg in 5 days, 56 mg in 2 days, 100 mg in 4 days, and a single dose of 50 mg (total 446 mg), also cortisone 325 mg in 2 days, 1000 mg in 8 days, 550 mg in 4 days, and 1650 mg in 10 days (total 3525 mg)

Results—On the second day after the administration of either ACTH or cortisone acetate she was less stiff On the third day the swelling of the joints began to decrease, and she could dress herself, wear her shoes, and raise her hands above her head By the seventh day she could walk with comparative ease, and her joints were not tender except to very hard pressure Since the first period of therapy she rarely has been unable to do her own housework. There was no significant change in her B P after the administration of either ACTH or cortisone Though there was a slight increase in body weight, no clinical evidence of œdema appeared Her weight returned to normal after the medications were discontinued The circulating eosinophils decreased from 107 to 0 per c mm by absolute count four hours after the injection of 25 mg of ACTH The corrected ESR decreased from 56 mm in one hour to 27 mm in one hour in two days, after the administration of 325 mg of cortisone acetate

Case 5—A white man, aged 64, had severe rheumatoid arthritis of the hands, wrists, elbows, shoulders, knees, ankles, and feet, and slight arthritis of the neck and hips His illness had begun, 2–2½ years before his first visit to the clinic, with an acute onset of pain in the right shoulder, which had responded to sedation. During the next few months there had been several recurrences of pain in his right shoulder, and then the other joints mentioned had become involved with increasing severity and persistence The symptoms included stiffness, pain, and swelling of the joints and general weakness Eventually the intense pain and disability forced him to discontinue working as a bridge construction worker Vitamins, liver extract, and salicylates had not given any relief When we first saw him any movement caused severe pain His gait was slow, deliberate, and stiff He had difficulty in rising from a sitting position and in raising his arms There was moderate swelling, tenderness, and limitation of movement in the hands, wrists, feet, ankles, and knees, and moderate limitation of movement in the shoulders For two months he had spent most of his time in a wheel-chair The ESR was rapid There was moderately severe anæmia, such that there was dyspnœa on mild exertion Radiography of the affected joints substantiated the clinical picture of moderately severe rheumatoid arthritis

Treatment—In the past year he has received ACTH 240 mg in 4 days, 50 mg in 2 days, 48 mg in 2 days, 100 mg in 4 days, 50 mg (single dose), and 200 mg in 4 days (total 688 mg), also cortisone 1000 mg in 6 days, 900 mg in 7 days 600 mg in 4 days, and 1550 mg in 10 days (total 4050 mg)

Results—Within twenty four hours after the administration of either ACTH or cortisone acetate there was great improvement in joint function Within forty eight hours he could close his hands with ease and walk up and down stairs without difficulty After each period of therapy he has not been forced to use a wheel chair Recently he went deep sea fishing and he has been active in cultivating his vegetable garden and in doing odd jobs about his home He has been using pick, shovel, and rake At present (three weeks after the end of therapy) he has little discomfort—none while at rest, but slight soreness of the feet and knees when he walks None of the joints are swollen or tender There is very little limitation of movement in the hands His colour is good the face and finger tips are pink He has no œdema and no dyspnœa on exertion

After the administration of either cortisone acetate or ACTH there was a slight increase in B.P, moderate pitting œdema of the feet and ankles, and a gain in body weight On two occasions the patient has gained 20 lb in weight The œdema which had developed during ACTH therapy subsided very rapidly, with a profuse diuresis which developed within 48 hours after the end of treatment On the other hand, the œdema that had developed on cortisone therapy subsided slowly over a period of from ten days to two weeks and was not associated with prompt diuresis after the end of therapy The circulating eosinophils decreased from 350 to 100 per c mm by absolute count four hours after the administration of ACTH 25 mg The corrected ESR decreased from 48 mm. in one hour to 30 mm in one hour in seven days after the administration of 1000 mg of cortisone acetate

Case 6—A white man, aged 53, had had moderately severe rheumatoid arthritis in the ankles, legs, arms, shoulders neck, and jaws for four years At first his symptoms had been mild and intermittent, but gradually they became more severe until for two months he was unable to work in his grocery store and some days could not walk more than a short distance Salicylates and "vitamin shots" had given him no relief, and for the past eight months he had been able to work only part-time in his store

On examination there was moderate swelling and limitation of movement of the ankles, wrists, and fingers

Treatment—In the past year he has received ACTH 300 mg in 6 days, and 500 mg in 5 days (total 800 mg), also cortisone 700 mg in 7 days, and 1100 mg in 10 days (total 1800 mg)

Results—Relief of pain followed within 24–48 hours after the administration of either ACTH or cortisone acetate Within two days he could move with ease and the swelling began to subside On the third day of therapy the swelling disappeared Since the initial period of therapy he has been able to supervise the work in his store

There was a slight rise in B.P during therapy with either cortisone acetate or ACTH, which subsided promptly when treatment was discontinued Although his weight increased slightly, there was no clinical evidence of pitting œdema His B.P and weight returned to the initial level soon after therapy was discontinued The circulating eosinophils by absolute count decreased from 282 to 81 per c mm four hours after the administration of ACTH 25 mg intramuscularly The corrected ESR decreased from 26 mm in one hour to 19 mm in one hour in fifteen days after the administration of cortisone acetate 500 mg intramuscularly

Case 7—A white university student, aged 21, had had severe rheumatoid arthritis of nearly all the joints for two and a half years All the joints had been involved at one time or another When we first saw him he was having severe pain in both shoulders, both knees the left wrist, and the fingers of both hands "Gold shots" and salicylates had not relieved the pain. There were tender painful nodules over the extensor surfaces just below both elbows and both heels The lymph glands were moderately enlarged and became painful each time there was an exacerbation of the arthritis

but their sera were invariably negative Hydrocephalus and convulsions may be common features of congenital toxoplasmosis, but no positive serum was obtained from a child in whom these were the only signs suggesting the disease A few weakly positive tests were obtained in a group of children with psychomotor retardation, but these were not confirmed by further investigation

Among the normal controls all the positive sera were from adults, and, excluding the samples from children, this series suggests that about 5% of normal adults have had previous contact with the parasite The figure is rather higher than that previously found in this country (Macdonald 1949, Cathie and Dudgeon 1949) Among the 100 normal children under ten years there was no positive serum, and though the number examined is small this suggests that symptomless infection is not often acquired in early childhood

The finding that 5% of " normal " adults have evidence of symptomless infection has two implications in assessing the diagnostic value of laboratory tests A positive serological test does not necessarily confirm the diagnosis of toxoplasmosis in an adult in whom the congenital form of the disease is suspected on clinical grounds Of 10 adult epileptic patients (not included in table I), 2 gave positive complement-fixation tests, but their contact with toxoplasma may have been fortuitous Similarly we did not obtain definitely positive results in several samples of serum from adults with chorio retinitis We must know more about the persistence of

TABLE II—TOXOPLASMA COMPLEMENT FIXING ANTIBODY IN INFECTED CHILDREN AND THEIR MOTHERS

Children with toxoplasmosis			Mothers
No	Age	C F titre	C F titre
1	10 mos	1 40	1 30
2	15	1 40	1 30
3	15	1 80	1 30
4	18 "	1 30	1 160
5	18	1 30	1 20
6	20	1 40	1 30
7	2 yr	1 40	1 10
8	2	1 20	1 10
9	3 "	1 10	1 20
10	5	1 20	1 15

antibody after infection before such tests can be relied on in adults The occurrence of symptomless infection in adults also makes it impossible to diagnose a child's illness from the serological findings in the mother's blood only Though a high titre of maternal antibody may suggest recent infection, we cannot safely deduce from it that the child had congenital toxoplasmosis, even when this is suspected clinically

ANTIBODY TITRES IN MOTHER AND CHILD

From what has been said it is clear that samples of blood from both mother and child are needed to confirm a clinical diagnosis. Other workers have compared the titre of antibody in the mother's and in the child's serum, and if the cases are infected in utero one might expect the antibody level of the affected child to fall with increasing age Table II shows no apparent relation between the titre of antibody in 10 mothers and their children and little to suggest that the infant s age is a reliable guide to the amount of complement fixing antibody in its serum Moreover, it will be seen from table II that the mothers of the last 3 cases listed still showed antibody in the blood several years after they had presumably transmitted infection to their unborn children

In 3 instances re-examination at eight, ten and twelve months of serum from mothers who had given birth to infected children some two years previously showed no detectable loss of complement fixing antibody during

TABLE III—COMPLEMENT FIXING ANTIBODIES IN SERA OF MOTHERS AND THEIR NEWBORN INFANTS

Source of sera	No of sera		No of sera with C F titre of				
	Tested	Pos	1 10	1 20	1 30	1 40	1 80
Mothers	53	9	3	2	3	—	1
Infants	53	8	2	3	2	—	1

these periods Whether the persistence of antibody in the mother means that parasites are still being carried and that there is thus a continuing stimulus to antibody formation is not known

TRANSFER OF MATERNAL ANTIBODY

Sabin and Feldman (1949a) have recently investigated the dye test and complement fixing toxoplasma antibodies in 3 mothers who had given birth first to a child with toxoplasmosis and then to a normal child. They found that both types of antibody were transmitted to the normal infants and that the transferred antibodies had almost disappeared after 4 or 5 months

During the examination of sera from 53 mothers and from their newborn infants who had some congenital abnormality it was learned that only 1 child had clinical signs strongly suggestive of toxoplasmosis and it died soon after birth The cord blood in this case contained antibody but material was not available for attempts to demonstrate the parasite The mother's blood gave positive complement fixing, dye, and neutralisation tests However, a number of mothers whose infants were normal, and also some mothers of infants with congenital defects such as spina bifida and anencephaly, had antibody in their sera, and positive tests were also obtained from samples of cord blood from the infants

Table III shows that of the sera from 53 mothers of infants with congenital defects 9 gave positive fixation at a serum dilution of 1/10 or over This is a rather higher proportion of positives than was found in normal adults and it naturally suggested that in the sera of recently delivered women there was some non specific fixation of complement However, all the positive samples in table III also gave positive dye and egg neutralisation tests, and the reaction appeared to be due to specific antibody Samples of cord blood gave very similar results, and table III suggests that there is an almost quantitative transfer of antibody from the maternal to the fœtal circulation , this was true whether complement-fixing or neutralising antibody was estimated

In 5 of these cases giving positive tests second samples of sera were obtained from both mother and infant and these were then tested in parallel with the first sera, using the same antigen in the case of the complement-fixation technique The interval between the collection of the first and second samples of blood varied from four to nine months and in all cases the mother's blood gave almost identical results in the two tests However, in the second samples of all the infants' sera the titre of antibody as measured by complement fixation was less than 1/5 , the toxoplasma neutralising power on eggs had disappeared and the dye test titres were very much reduced There was, in effect the expected loss of passively transferred antibody in the children and there was also no clinical evidence that they had acquired the disease

It seems clear, therefore that maternal antibody can be transferred to the fœtal circulation and that this occurs without any simultaneous transfer of infection It may be that the mother who already possesses antibody in her blood does not infect her fœtus and the protective effect of anti serum which can be demonstrated on the chorio allantois probably also operates in the human body If this is so it suggests that only a woman who

able effects of long continued treatment with either cortisone or A C T H, and the minimal undesirable effects observed in our patients treated as they were, it seems probable that therapy with these hormones will develop on the lines we have tried—i e., patients will not be treated continuously but at each relapse will receive the minimum amount of hormones needed to establish a remission Possibly A C T H and cortisone should be used alternately

SUMMARY AND CONCLUSIONS

Seven patients with rheumatoid arthritis were treated at intervals over a period of twelve months with pituitary A C T H and synthetic cortisone acetate In each case the symptoms improved after the injection of adequate amounts of either of these materials In contrast, pregnenolone acetate, deoxycortone acetate and ascorbic acid, acetylsalicylic acid, and placebos produced no relief

After the injections of cortisone or A C T H were discontinued the symptoms gradually returned The longest period of relief following a series of injections was four and a half months After each period of either cortisone or A C T H therapy the relief of symptoms was as great as that which followed the initial period, suggesting that the effectiveness of these hormones does not diminish in a year

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INCIDENCE OF TOXOPLASMA INFECTION IN NORTH-WEST ENGLAND*

TRANSMISSION OF ANTIBODY FROM MOTHER TO FŒTUS

ALEXANDER MACDONALD
M A, M D Aberd
READER IN BACTERIOLOGY, UNIVERSITY OF LIVERPOOL

SINCE the first reports of congenital toxoplasmosis in Britain by Jacoby and Sagorin (1948) and by Farquhar and Turner (1949) only a few further cases have been described and we still know little about the incidence or distribution of the disease in this country Complement fixing and neutralising antibodies are present in the serum of some apparently healthy people (Macdonald 1949, Cathie and Dudgeon 1949), and symptomless infection may not be uncommon, at least in adults Clinicians recognise a number of signs which suggests congenital toxoplasmosis, but it is clear that, by them selves, these signs are insufficient for diagnosis Never theless, it is important to try to circumscribe the range of clinical manifestations which calls for laboratory investigation and to obtain some guidance on the incidence of the infection This note is chiefly concerned with the results of tests on samples of serum from infants and mothers submitted by clinicians, mainly in north west England The findings will also be discussed in relation to the transfer of maternal antibody to the fœtus

LABORATORY METHODS

For the detection of antibody in sera the complement fixation test, with soluble egg antigen derived from infected chorio allantoic membranes, was used as a routine The technique was similar to that previously described (Macdonald 1949), but in preparing the antigen final centrifugation was carried out at 9000 r p m for an hour A serum which fixed complement with this toxoplasma antigen at a dilution of 1 10 or higher was considered positive, at 1 5 the result was regarded as doubtful.

Feldman and Sabin's dye test and the neutralisation test on the chorio allantois were also used for the detection of antibody in all doubtful and positive cases but in only a proportion of cases which gave negative complement fixation Cathie and Dudgeon's modification of the dye test was used, and the neutralisation test in eggs was done with unheated serum which was kept frozen until required Since many workers consider that the dye test is the most sensitive method, more positive results might well have been obtained if this test had been applied to all specimens Sabin (1949), however, takes the view that with egg antigen the complement fixation method by itself can supply the laboratory diagnosis in most cases of congenital toxo plasmosis

COMPARISON OF CLINICAL AND LABORATORY FINDINGS

It is assumed that antibody in a patient's serum which reacts with toxoplasma antigen is the result of specific contact with that parasite, since no organism related antigenically to toxoplasma has yet been described Clinical signs in an infective process are necessarily variable, but in correlating tests for toxoplasma antibody with the clinical picture we have accepted as cases of toxoplasmosis only those children who had both chorio retinitis and cerebral calcification Some such selection was necessary because of the variety of pathological conditions which can give rise to one or other of the recognised signs of toxoplasmosis, and the arbitrary choice of clinical manifestations was influenced by Sabin's view that nine out of ten cases of the disease have both these signs Most of the cases considered doubtful on clinical grounds were in infants or young children who did not qualify for the first group but had some other signs of congenital toxoplasmosis The group of "normal" controls is composite 150 sera from blood donors, 100 from children under ten years, and the remainder specimens of adult serum sent for tests other than for toxoplasmosis

There is good agreement between the clinical diagnosis and the results of laboratory tests in the first group of children in table I Of the 2 patients who satisfied the clinical requirements but gave negative complement fixation, one gave a titre of 1/64 by the dye test, which by itself was not thought significant, while the other was negative by all tests

In the group of doubtful cases only 6 out of 88 sera gave positive complement fixation, 4 were confidently diagnosed on clinical grounds and had positive dye and neutralisation tests, though they did not have both chorioretinitis and cerebral calcification, and in 2 others the dye and egg neutralisation tests were doubtful or negative All other children with hydrocephalus, chorio retinitis, or convulsions, or combinations of these, gave negative serological tests This doubtful group included some members of the same families with chorioretinitis,

TABLE I—CORRELATION BETWEEN CLINICAL AND LABORATORY DIAGNOSIS

Clinical diagnosis	No of sera		No of sera with C F titre of						
	Tested	Pos	1 10	1 15	1 20	1 30	1 40	1 80	1 160
Toxoplasmosis	12	10	1	—	2	2	4	1	—
Doubtful	88	6	2	1	1	1	—	1	—
Normal controls	350	13	8	3	1	—	1	—	—

* Based on a paper read at the Brighton meeting of the Association of Clinical Pathologists, January, 1950

it their sera were invariably negative Hydrocephalus id convulsions may be common features of congenital oxoplasmosis, but no positive serum was obtained from child in whom these were the only signs suggesting ie disease A few weakly positive tests were obtained a group of children with psychomotor retardation, at these were not confirmed by further investigation

Among the normal controls all the positive sera were om adults, and, excluding the samples from children, is series suggests that about 5% of normal adults ave had previous contact with the parasite The figure rather higher than that previously found in this ountry (Macdonald 1949, Cathie and Dudgeon 1949) among the 100 normal children under ten years there as no positive serum, and though the number examined small this suggests that symptomless infection is not ften acquired in early childhood

The finding that 5% of "normal" adults have evidence f symptomless infection has two implications in assessing he diagnostic value of laboratory tests A positive erological test does not necessarily confirm the diagnosis of toxoplasmosis in an adult in whom the congenital form of the disease is suspected on clinical grounds Of 10 adult epileptic patients (not included in table I), 2 gave positive complement fixation tests, but their contact with toxoplasma may have been fortuitous Similarly we did not obtain definitely positive results in several samples of serum from adults with chorio retinitis We must know more about the persistence of

TABLE II—TOXOPLASMA COMPLEMENT FIXING ANTIBODY IN INFECTED CHILDREN AND THEIR MOTHERS

Children with toxoplasmosis			Mothers
No	Age	c r titre	c r titre
1	10 mos	1 40	1 30
2	15 "	1 40	1 30
3	15 "	1 80	1 30
4	18 "	1 30	1 160
5	18 "	1 30	1 20
6	20 "	1 40	1 30
7	2 yr	1 40	1 10
8	2 "	1 20	1 10
9	3 "	1 10	1 20
10	5 "	1 20	1 15

antibody after infection before such tests can be relied on in adults The occurrence of symptomless infection in adults also makes it impossible to diagnose a child's illness from the serological findings in the mother's blood only Though a high titre of maternal antibody may suggest recent infection, we cannot safely deduce from it that the child had congenital toxoplasmosis, even when this is suspected clinically

ANTIBODY TITRES IN MOTHER AND CHILD

From what has been said it is clear that samples of blood from both mother and child are needed to confirm a clinical diagnosis Other workers have compared the titre of antibody in the mother s and in the child s serum, and if the cases are infected in utero one might expect the antibody level of the affected child to fall with increasing age Table II shows no apparent relation between the titre of antibody in 10 mothers and their children and little to suggest that the infant's age is a reliable guide to the amount of complement-fixing antibody in its serum Moreover, it will be seen from table II that the mothers of the last 3 cases listed still showed antibody in the blood several years after they had presumably transmitted infection to their unborn children

In 3 instances re-examination at eight ten, and twelve months of serum from mothers who had given birth to infected children some two years previously showed no detectable loss of complement-fixing antibody during

TABLE III—COMPLEMENT FIXING ANTIBODIES IN SERA OF MOTHERS AND THEIR NEWBORN INFANTS

Source of sera	No of sera		No of sera with c-r titre of				
	Tested	Pos	1 10	1 20	1 30	1 40	1 80
Mothers	53	9	3	2	3	—	1
Infants	53	8	2	3	2	—	1

these periods Whether the persistence of antibody in the mother means that parasites are still being carried and that there is thus a continuing stimulus to antibody formation is not known

TRANSFER OF MATERNAL ANTIBODY

Sabin and Feldman (1949a) have recently investigated the dye test and complement fixing toxoplasma antibodies in 3 mothers who had given birth first to a child with toxoplasmosis and then to a normal child. They found that both types of antibody were transmitted to the normal infants and that the transferred antibodies had almost disappeared after 4 or 5 months

During the examination of sera from 53 mothers and from their newborn infants who had some congenital abnormality it was learned that only 1 child had clinical signs strongly suggestive of toxoplasmosis and it died soon after birth The cord blood in this case contained antibody but maternal was not available for attempts to demonstrate the parasite The mother's blood gave positive complement-fixing, dye, and neutralisation tests However, a number of mothers whose infants were normal, and also some mothers of infants with congenital defects such as spina bifida and anencephaly, had antibody in their sera, and positive tests were also obtained from samples of cord blood from the infants

Table III shows that of the sera from 53 mothers of infants with congenital defects 9 gave positive fixation at a serum dilution of 1/10 or over This is a rather higher proportion of positives than was found in normal adults and it naturally suggested that in the sera of recently delivered women there was some non specific fixation of complement However, all the positive samples in table III also gave positive dye and egg neutralisation tests, and the reaction appeared to be due to specific antibody Samples of cord blood gave very similar results and table III suggests that there is an almost quantitative transfer of antibody from the maternal to the fœtal circulation, this was true whether complement-fixing or neutralising antibody was estimated

In 5 of these cases giving positive tests second samples of sera were obtained from both mother and infant and these were then tested in parallel with the first sera, using the same antigen in the case of the complement-fixation technique The interval between the collection of the first and second samples of blood varied from four to nine months and in all cases the mother's blood gave almost identical results in the two tests However, in the second samples of all the infants sera the titre of antibody as measured by complement-fixation was less than 1 5, the toxoplasma-neutralising power on eggs had disappeared and the dye test titres were very much reduced. There was in effect, the expected loss of passively transferred antibody in the children and there was also no clinical evidence that they had acquired the disease.

It seems clear therefore that maternal antibody can be transferred to the fœtal circulation and that this occurs without any simultaneous transfer of infection. It may be that the mother who already possesses antibody in her blood does not infect her fœtus, and the protective effect of anti serum which can be demonstrated on the chorio allantois probably also operates in the human body If this is so it suggests that only a woman who

acquires her infection during pregnancy is likely to pass on the disease to her child

DISCUSSION

The serological tests indicate that congenital toxoplasmosis is rather more prevalent in north-west England than had been thought, but it is apparently not a common cause of congenital abnormality The specimens considered here were sent by clinicians particularly interested in the disease and are not a random sample of sera from abnormal infants On the other hand, many samples were received from infants who did not have the two characteristic signs of the disease—chorio retinitis and cerebral calcification There are obvious dangers in demanding a particular clinical picture when considering which signs and symptoms in a child call for laboratory investigation Moreover, it is well known that other pathological processes may give rise to much the same clinical manifestations as toxoplasmosis Sabin's view that most children with congenital toxoplasmosis have both chorioretinitis and cerebral calcification was useful in indicating which specimens were likely to give positive serological tests Hydrocephalus, convulsions, and psychomotor retardation have not, by themselves, been of value in this way, nor has chorio retinitis without cerebral calcification When the clinical diagnosis was made on both chorioretinitis and cerebral calcification, 10 out of 12 sera gave confirmatory positive serological tests, whereas of the 88 sera from clinically "doubtful" cases, where both these signs were not present, only 6 gave a positive complement fixation test, and on further investigation 2 of the 6 were probably not toxoplasmosis

A question often asked is whether a mother who has had one child with toxoplasmosis is likely to infect her subsequent children A related problem is whether, when several members of the same family have a suggestive congenital defect, such as chorioretinitis, it is worth while examining their sera for toxoplasma infection In several such families our tests have been invariably negative Sabin and Feldman (1949b) and other experienced workers say that when a mother has one child with congenital toxoplasmosis her subsequent children are likely to be normal This would support the view already expressed, that if a mother's serum contains antibody, particularly neutralising antibody, her fœtus will be protected from infection One might expect neutralising antibody to operate protectively on both sides of the placental barrier, but immunological considerations may not be the only ones involved We do not know where or for how long the mother harbours the parasite, though it seems likely that she will transmit the infection to the fœtus through her placenta only before she develops antibody—that is, only for a short time after she acquires her infection This view might explain the low incidence of congenital toxoplasmosis in a community with a high incidence of latent infection in adults

SUMMARY

Out of 12 children who had both chorioretinitis and cerebral calcification 10 gave positive serological tests for toxoplasmosis, whereas out of 88 children having various congenital defects but not these two signs only 4 were found to have positive sera

Of 250 samples of serum from "normal" adults in north west England 13 gave positive complement fixation tests with toxoplasma antigen Such symptomless infection must be kept in mind when interpreting laboratory results.

Complement fixing and neutralising antibodies are transmitted from the mother to her fœtus, and it is thought that infection crosses the placenta only if the mother has been infected so recently that her antibodies have not yet developed

References at foot of next column

CONGENITAL TOXOPLASMOSIS

REPORT OF TWO CASES IN TWINS

H G FARQUHAR

B.M Oxfd, M R C P, D C H

ASSISTANT PHYSICIAN, ROYAL LIVERPOOL CHILDREN'S HOSPITAL

With illustrations on plate

Two cases of congenital toxoplasmosis in the Liverpool district have already been described (Farquhar and Turner 1949), it was then suggested that this disease might be recognised with increasing frequency in the British Isles, and in fact seven other British cases have been recorded (Jacoby and Sagorin 1948, Wilson and Forest Smith 1949, Ridley 1949, Nutt 1949, Hutchison 1949, Wylie and Fisher 1950) The two cases reported here occurred in twins

CASE RECORD

A girl, aged 8 months, attended the outpatient department of the Royal Liverpool Children's Hospital with hydrocephalus for investigation She was the first of twins prematurely born at the 34th week of pregnancy Her birth weight had been 4 lb 2 oz, and that of her brother 4 lb The birth had been normal, but the patient had had some neonatal pallor but no cyanosis or jaundice The mother's health during this, her first pregnancy, had been excellent, and she had had no cough, rash, or fever

Fig 1—Right-sided microphthalmos and enophthalmos in girl with toxoplasmosis

The family was a healthy one The mother, aged 26, had had scarlet fever at the age of 4 years, bronchopneumonia at the age of 7 years, and mumps at the age of 9 years At the age of 19 she had had an illness diagnosed as anæmia and asthenia which had required medical attention for three months, during which she had lost 3 st in weight Clinical examination of the chest at that time was said to have revealed no abnormality, but no other record of this illness could be obtained The father, aged 27, had had measles as a child and suffered from recurring blepharitis Save for this he had always been healthy

The mother had come into fairly regular contact with two dogs and two cats during her pregnancy The house was free from mice and there were no birds in it, but the mother had worked during the first six months of her pregnancy in a factory where there were many mice

Shortly after the patient's birth it was noticed that her right eye remained closed, and when it gradually opened the eye was seen to be smaller than the left For the second and third months of life feeding was difficult, but with encouragement a steady weight gain was obtained When the patient was 5 months old her mother noticed the sudden appearance of a swelling in the region of the anterior fontanelle and within two to three weeks the whole head began to enlarge rapidly Before this the mother had remarked on the smallness of the child's head compared with that of her twin, but it rapidly became much the larger of the two The mother suspected that the child was blind in the right eye, though she thought there was some vision in the left eye, and nystagmoid movements had been observed in both eyes The head was not held up normally like that of her twin, and she made no attempt to sit up There had been no convulsions or loss of consciousness

DR MACDONALD REFERENCES

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Fig 2—Same girl as in fig 1 showing anterior fontanelle tense frontal bones prominent, and apparent downward displacement of eyes.

On examination the child weighed 16 lb She lay on her back, taking no notice of her surroundings, with wide searching nystagmoid movements of the eyes She often tried to raise her head off the bed but could not keep it raised There was a right-sided microphthalmos and enophthalmos (fig 1) The skull circumference was 18½ in The anterior fontanelle was tense the frontal bones were prominent, and there was a suggestion of downward displacement of the eyes (fig 2) The right cornea was 6 5 mm. in diameter, the pupil was contracted and unresponsive to light and no red reflex could be obtained The anterior chamber was shallow but no further details could be made out, because the posterior chamber was filled with a greyish green mass obstructing the view of the fundus The left cornea was 8 mm. in diameter The anterior chamber was again shallow, and there were a few posterior synechiæ There were fine lental and vitreous opacities, and an area of choroidoretinal degeneration was seen in the superior temporal region No other abnormalities were found in the cranial nerves The hearing could not be tested accurately, but the child turned her head to a spoken voice The arms and legs were spastic, the tendon reflexes brisk, and the plantar reflexes extensor It was obvious that there was gross mental retardation. Examination of the other systems was essentially negative There was no enlargement of the liver or spleen. There was no abnormal enlargement of the lymph glands, and the chest and heart were clinically normal.

Investigations—For toxoplasma antibodies see the accompanying table Ventricular fluid was normal microscopically and biochemically intraperitoneal and intracerebral injection of it into mice did not lead to infection. A blood-count showed Hb 70% red cells 4,200 000 and white cells 7000 per c.mm. (differential count normal)

Radiography of the skull showed fine calcification anterior to and above the sella turcica (fig 3 on plate) Air ventriculography (fig 4 on plate) showed gross internal hydrocephalus Radiography of the chest was normal.

INVESTIGATION OF TWIN BROTHER

Development in the girl s twin brother was entirely normal. At 8 months he weighed 19 lb and could pull himself to his feet Clinical examination was entirely negative except that both fundi showed very superficial atrophy in the perimacular region and a fine pigmentary deposit diffusely spread over both retinæ. Radiography of the skull and chest showed no abnormality (For toxoplasma antibodies see the table)

INVESTIGATION OF FATHER AND MOTHER

No clinical examination was made of the parents except of their optic fundi which were normal Radiograms of the chests of both parents were normal The mother s blood Wassermann reaction was negative (For toxoplasma antibodies see the table)

DISCUSSION

The published work on congenital toxoplasmosis has been summarised by Callahan et al. (1946), Schwartzman et al. (1948) Frenkel (1949) Wyllie and Fisher (1950) and others Cross (1947) has given an excellent and detailed account of the morphology of the causal organism, and Kean and Grocott (1948) have described the necropsy findings

In the present cases the girl exhibited the now well known tetralogy of congenital toxoplasmosis—i e , cerebral calcification, hydrocephalus, chorioretinitis, and positive serological tests for toxoplasma antibodies As in most of the cases so far reported the causal parasite was not isolated Hydrocephalus, chorioretinitis, microphthalmos, and mental retardation have all been found in infants believed not to have toxoplasmosis and having negative serological tests for toxoplasma antibodies , in such cases cerebral calcification is rare, occurring in only 5%

In patients with positive serological reactions and these clinical manifestations cerebral calcification has been present in 90% of cases (Sabin and Feldman 1949a) Greater emphasis is therefore now laid on the finding of cerebral calcification in the diagnosis of toxoplasmosis, and its association with the typical clinical findings and positive serological tests is highly suggestive The diagnostic tests and their significance have been fully described by Sabin and Feldman (1948), Warren and Russ (1948), and Macdonald (1949), and the pathogenesis, diagnosis, and treatment by Frenkel (1949)

Toxoplasmosis has been described in monovular twins by Zuelzer (1944) and Heath and Zuelzer (1945) (the same cases) and by Abbott and Camp (1947), but the latter did not consider the diagnosis proved , and in binovular twins by Bamatter (1947)

The boy's case reported here is of particular interest The high titre of antibody found could in theory be explained in two ways either it is due to antibody transmitted from the mother to the child in utero, in the absence of any disease in the child , or the child is infected The fact that the titre is higher in the child than in his mother seems to argue against the former hypothesis, which becomes the more improbable in the light of recent work which has demonstrated the short persistence of these antibodies in the serum of an uninfected child of an infected mother Thus complement-fixation antibodies may be absent at the age of 4½ months, and neutralising antibodies as demonstrated by the dye test can only be demonstrated in minute amounts in undiluted serum or at the most in half-strength serum at the age of 9 months (Sabin and Feldman 1949b)

RESULTS OF COMPLEMENT FIXATION AND NEUTRALISATION TESTS FOR TOXOPLASMOSIS

Test	Dye test	Complement-fixation test	Neutralisation test on chorio-allantoic membrane
Girl	1/512	1/40	+
Boy	1/512	1/40	+
Mother	1/256	1/20	+
Father	Neg	Neg	Neg
Cat	Neg	Neg	Neg
Dog	1	Anticomplementary	

It therefore seems probable that the boy is infected If so it is difficult to know what significance to ascribe to the ophthalmological findings These were very mild, and, though they were considered to be outside the range of the normal, it would be difficult to attribute them to the action of the toxoplasma organism, though this possibility cannot be entirely excluded, and their perimacular distribution might be considered suggestive If this child is infected it is necessary to assume either that fewer parasites entered his blood than that of his twin, or that his resistance to the disease was greater A more remote possibility is that he was infected by his mother's milk If this is true it must have occurred in the first week of life, for after this time breast-feeding was abandoned.

SUMMARY

In binovular twins the girl had typical toxoplasmosis, with cerebral calcification, hydrocephalus, chorioretinitis, and toxoplasma antibodies in her serum

Her twin brother had similar antibodies but no clinical signs of the disease except mild ocular abnormalities Since the mother's titre of antibodies was lower than his, and he was 8 months old, he was probably infected with toxoplasmosis and had not acquired his antibodies merely by transmission from his mother

I wish to thank Dr R W Brookfield for his kindness in letting me see these children, Prof N B Capon for his valuable criticism in the preparation of this paper, Dr N Walker for the radiological reports, Dr A. Macdonald for the serological investigations, Mr J A. McCann for the ophthalmological findings, and Dr DeChenu for his help in investigating the home environment and obtaining the animal specimens

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TOXOPLASMOSIS

COMPLICATED BY CHICKENPOX AND SMALLPOX

REPORT OF A CASE

IAN D RILEY — M D Leeds, M R C.P, D C H
GAVIN C ARNEIL — M D Glasg, F.R F.P S
OF THE PÆDIATRIC DEPARTMENT, STOBHILL HOSPITAL, GLASGOW

SINCE toxoplasma infection in man was first recorded by Wolf et al (1939a and b) it has been recognised in many countries Six cases have been reported in England and two in Scotland (Jacoby and Sagorin 1948, Farquhar and Turner 1949, Hutchison 1949, Nutt 1949, Ridley 1949, Wyllie et al 1950), all being of the congenital type secondary to infection in the mother A further case of infection in mother and child is reported below

CASE RECORD

A girl, aged 9 months, was admitted on Jan 20, 1950, with convulsions of a few hours duration Her mother and father, both aged 23, were interviewed and appeared to be healthy Neither had had any unusual or unexplained illness They had been married 3 years and had one other child, a healthy boy aged 2¼ years The relatives of the baby's mother and brother were normal, and the mother's Wassermann and Kahn reactions were negative

The mother's health had been good during this last pregnancy apart from mild morning sickness at 3 months, and the baby had been born spontaneously but six weeks prematurely, her birth weight being just over 4 lb Otherwise the baby had seemed normal, except for a squint, and she had eagerly taken her feeds of boiled cow's milk At the age of 6 weeks she had had a febrile illness with a maculopapular rash, thought to be measles

On admission the baby had repeated convulsions, consisting of rapid generalised twitches of the whole body These subsided a few hours after the administration of chloral, and did not return She was small and active, tried to sit up in bed, followed a light well with her eyes, and seemed to be of normal intelligence Her skull was asymmetrical, the left side being the smaller, and measured 15 in. in circumference (normal average for her age 18 in.) The anterior fontanelle had closed prematurely All the tendon reflexes were brisk, the abdominal reflexes were present, and both plantar responses were extensor All four limbs were spastic, but no clonus was elicited There was a palsy of the sixth cranial nerve on the left side The pupils were equal and central and reacted to light The spleen was not palpable, and no lymphadenopathy was found The left eye showed microphthalmos, old iritis, and chorioretinitis In the right eye a large patch of choroiditis was visible in the region of the macula, with gross pigmentary disturbance more peripherally

Investigations—Blood examination on Jan 20 showed red cells 4,150,000 per c mm, Hb 10 5 g per 100 ml, and white cells 7000 per c mm (eosinophils 550 per c.mm), no abnormality of platelets, erythrocytes, or granular, mononuclear, or lymphocyte series Lumbar puncture on Feb 27 produced slightly turbid cerebrospinal fluid, containing 100 lymphocytes per c mm and an increased amount of globulin. A Pandy test was positive Blood Wassermann and Kahn tests on Feb 22 were negative, and a Mantoux test with 1/1000 Old Tuberculin on Jan 22 was also negative

Radiography of the skull on Jan 28 showed small areas of calcification scattered diffusely throughout the brain (see figure)

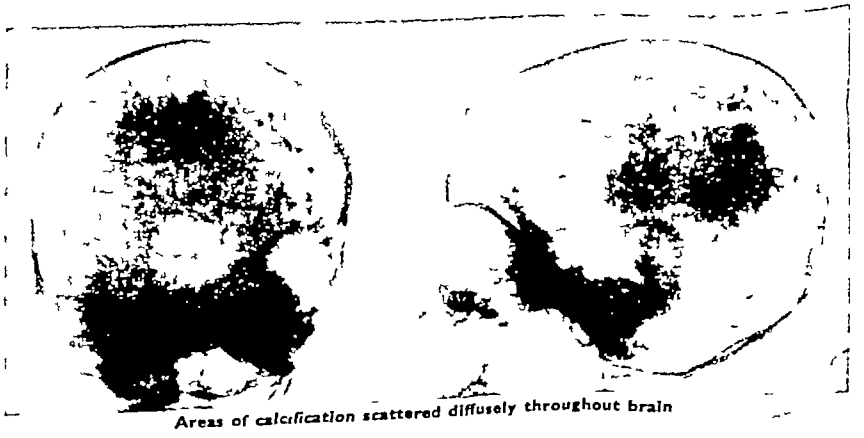
Serological Tests for Toxoplasmosis—Cytoplasm modifying dye test positive at 1/256, rabbit skin neutralising test gave neutralisation of 100 skin test doses (Prof C P Beattie) Dye test titration positive at 1 in 250 (Prof Sven Gard) These tests were performed on mother and child with identical quantitative results, indicating recent or active infection.

Progress—The child remained well and was afebrile, gaining weight steadily, until March 14 when she developed chickenpox She was transferred to a fever hospital and there came in contact with an Indian seaman, later found to have smallpox The baby was then transferred on March 27 to a smallpox hospital, and on March 31 she became pyrexial and developed a steadily progressive maculopapular and then pustular rash on her face, limbs, and palate Scrapings of these lesions were later reported positive for smallpox On April 3 the rash became more profuse and petechial The smallpox appeared to be modified in severity, though the child had not been vaccinated before exposure to the infection, but she died on April 3 No necropsy was done

DISCUSSION

It has been known for forty years that toxoplasma is parasitic on many animals, but it was not recognised to be a cause of disease in man until 1939 Cases previously reported—e g, that of Wolf and Cowen (1937)—were then correctly diagnosed in retrospect

Five types of infection are described (*Lancet* 1948) (1) a symptomless form in adults, detected either sero



Areas of calcification scattered diffusely throughout brain

logically or by the birth of an infected infant, (2) encephalitis in older children, (3) acute illness with a rash, resembling measles, in adults, (4) chronic encephalitis in adults, and (5) an infection acquired in utero The organism has a predilection for the eye and the brain and has often been obtained from these sites The clinical and pathological picture (see Binkhorst 1948) varies according to the site and extent of the lesions In the congenital form the four most constant clinical features are deformity of the skull, convulsions, chorioretinitis, and intracranial calcification The diagnosis is most satisfactorily established by isolation of the organism, but this is not always possible The serological tests described by Sabin (1942) and Sabin and Feldman (1948) provide a reliable proof of active or recent infection

The present case presents several of the features described in the congenital type (1) a maculopapular eruption with a febrile illness in the neonatal period, (2) microcephaly with asymmetry of the skull and premature synostosis, (3) bilateral choroidoretinitis with pigmentary derangement, left sided microphthalmos, sixth nerve palsy, and iritis, (4) convulsions, (5) scattered areas of calcification within the cranial cavity, and (6) positive serological findings The lymphocytic pleocytosis in the cerebrospinal fluid and the well marked absolute eosinophilia in the blood suggested that the infection was active Thus the child had the congenital form of toxoplasmosis (type 4) and her mother the symptomless infection (type 1)

We wish to thank Prof Sven Gard, of Stockholm, and Professor Beattie, of Sheffield, for doing the serological tests, Dr Spence Meighan for examining the optic fundi, and Dr M. A Foulis for his report on the course of the child s smallpox infection in Robroyston Hospital.

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SIMPLIFIED PROCEDURE FOR DETERMINING THE RENAL CLEARANCE OF INULIN AND DIODONE

O OLBRICH
Ph.D Edin F.R C.P E

M. H FERGUSON
Ph.D Edin., B.Sc Manitoba

J S ROBSON
M.D Edin., M.R C.P.E

C P STEWART
M.Sc Durh., Ph.D Edin.

From the Clinical Laboratory, Royal Infirmary, Edinburgh

THE main reason why measurement of the discrete functions of the kidney has not become a routine procedure is that the clearance technique originally described by Smith et al (1938) requires continuous infusion of the test substance and catheterisation of the patient Recently we have devised simplified methods for estimating the rate of glomerular filtration, as measured by the renal clearance of inulin (C_{In}), the tubular excretory mass as measured by the maximal capacity to excrete diodone (T_{mD}), and the effective renal plasma flow, as measured by the diodone clearance (C_D) Only one intravenous injection is used and catheterisation is seldom necessary The derivation of the formulæ employed is given in our original communications (Robson et al 1949a and b) where the claims of Smith and his colleagues with regard to the renal treatment of these substances have been accepted In this paper we present the details of our technique

All the procedures involve (1) a single injection of inulin and/or diodone, in accurately measured amount, (2) the collection of two samples of urine after intervals sufficiently long to obviate, as a rule, the need for catheterisation, and (3) the sampling of venous blood immediately before the urine is collected The subject should have fasted from the previous evening and should be recumbent during the investigation Water is given freely by mouth

RENAL CLEARANCE OF INULIN

Preparation and Injection of Inulin Solution

Inulin (Kerfoot s pure bacteriological) is dissolved in sterile saline with the aid of heat to make an approximately 10% (w/v) solution, and after partial cooling the solution is passed through a sterile Seitz filter Inulin crystallises from the sterile filtrate on cooling but is readily redissolved by warming, after which it is re cooled to 30–35°C for injection The inulin content of each batch of solution is determined chemically

A sample of venous blood (for control analysis) is withdrawn from the subject and an accurately measured volume of the inulin solution containing 100–120 mg of inulin per kg body weight, is injected intravenously (a 'Record' syringe of 100 ml capacity is convenient), the injection taking 2–5 minutes The time is noted when the injection begins and ends

With this technique no evidence of toxicity has been observed

Blood and Urine Collection

At two carefully noted times, about 30 and 100 minutes after the midpoint of the injection, urine is collected, the bladder being emptied as completely as possible Since it is necessary to know only the total amount of inulin excreted, there is no need for the subject to empty the bladder before the injection on the contrary a full bladder at that time will increase the accuracy of the first urine collection 30 minutes later At, or immediately before, these urine collections, venous blood is withdrawn (10 ml, oxalated)

Chemical Analysis

Inulin is determined in the plasma from the three blood samples and in the two urine samples, as well as in a sample of the inulin solution used for injection. The method used in our own determination was that of Steinitz (1938) as modified by S W Cole (unpublished), in which inulin is hydrolysed and the resulting lævulose is determined by its colour reaction with resorcinol For this particular method the plasma may be diluted to 2 or 3 times its volume with water and the urine to 200 times its volume with the object of producing, in the material actually analysed an inulin concentration of about 20 mg per 100 ml The pre injection plasma provides a 'blank' correction, usually of the order of 1 mg per 100 ml plasma

Calculation

The weight of inulin injected minus the weight of inulin in the urine passed at the first collection gives the weight of inulin remaining in the body at that time This divided by the plasma water inulin concentration at the same time gives the first 'volume of distribution' (VI_1) Similarly the weight of inulin injected minus the total weight excreted in both urine samples gives the weight remaining in the body at the time of the second urine collection, and this, divided by the second plasma water concentration of inulin gives the second 'volume of distribution" (VI_2)

The plasma water renal clearance of inulin (C'_{In}) is given by the formula

$$C'_{In} = \frac{b\,(\log_{10}P_1 - \log_{10}P_2)}{\log_{10}VI_2 - \log_{10}VI_1} - b$$

where P_1 and P_2 are the concentrations of inulin in mg per 100 ml of plasma water at the times of collection t_1 and t_2 (times in minutes measured from the midpoint of the injection) VI_1 and VI_2 are as described, the volumes of

distribution at these times (conveniently expressed in hundreds of millilitres),

$$b = \frac{VI_2 - VI_1}{t_2 - t_1}$$

C'_{In} is readily converted to the conventional plasma clearance of inulin (C_{In}) in millilitres plasma per minute by multiplying by the factor

$$\frac{10\,000}{100 - g \text{ plasma protein/100 ml}}$$

and for ordinary purposes the plasma protein concentration can be regarded as constant, so that

$$C_{In} = 106 \times C'_{In}$$

The following is a chart of the timing of the operations and an example of the calculation

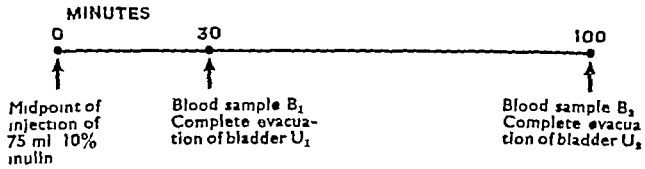

Fig 1—Determination of the renal clearance of inulin

Plasma proteins = 7 g /100 ml
Total inulin injected at t = 0 was 7410 mg

—	Minutes	Inulin excreted (mg)	Inulin retained in body (mg)	Plasma inulin conc /100 ml (mg)	Plasma-water inulin conc /100 (mg)	(V_I)
t_1	30	1656	5754	48 3	51 9	111
t_2	100	3449	3961	29 6	31 8	125

$$b = \frac{125 - 111}{100 - 30} = 0\ 200$$

$$C_{In} = \frac{0\ 200\ (\log_{10} 51\ 9 - \log_{10} 31\ 8)}{\log_{10} 125 - \log_{10} 111} - 0\ 200 = 0\ 6248$$

$$\text{Plasma inulin clearance} = \frac{0\ 6248 \times 10\ 000}{(100 - 7)} = 67\ 2 \text{ ml /min}$$

RENAL CLEARANCE OF DIODONE

The method is essentially similar to that for inulin clearance and so also is the calculation

Preparation and Injection of Diodone Solution

It is convenient to use, without dilution, the 35% (w/v) solution of diodone obtainable in sterile ampoules from Glaxo Laboratories Ltd (Greenford, Middlesex, England) The dose required is one which will give plasma diodone levels of not more than 5 mg per 100 ml (in terms of iodine) when the first blood sample is taken, and not less than 1 mg per 100 ml when the second sample is taken In practice this means 7–8 ml of the solution for a person of 70 kg body weight and with normal renal function, but when severe depression of renal function is expected the dose should be reduced to 4 ml for 70 kg body weight The injection, for which a 10 ml syringe is suitable, should take 1–2 minutes and the exact times should be recorded

Toxic reactions to diodone in these amounts are uncommon, but include urticaria, tenesmus flushing and vomiting

Blood and Urine Collection

The procedure is similar to that after inulin injection, but because of the rapid elimination of diodone, the first blood and urine collections should be made 20 minutes, and the second 60 minutes, after the midpoint of the injection

Chemical Analysis

Diodone is determined in plasma and urine samples by Alpert's method (1941) in which the diodone iodine is quantitatively oxidised by bromine to iodate, and this is titrated with sodium thiosulphate The results for plasma are expressed as mg diodone iodine per 100 ml of plasma water, for urine the total diodone iodine in the sample is required

Calculation

For the respective collection times t_1 and t_2 (measured in minutes from the midpoint of the injection) the "volumes of distribution," VD_1 and VD_2 are calculated exactly as for inulin These values are substituted in the formula

$$C'_D = \frac{q\ (\log_{10} P_1 - \log_{10} P_2)}{\log_{10} VD_2 - \log_{10} VD_1} - q$$

in which

C_D = the plasma water renal clearance of diodone

P_1 and P_2 are the concentrations of diodone iodine in mg per 100 ml of plasma water at times t_1 and t_2

VD_1 and VD_2 are as described, and are expressed in hundreds of millilitres

$$q = \frac{VD_2 - VD_1}{t_2 - t_1}$$

As in the case of inulin, the plasma-diodone clearance (C_D) in millilitres per minute is then given by the expression

$$C_D = 106 \times C'_D$$

or more correctly,

$$C_D = \frac{10\ 000 \times C'_D}{100 - g \text{ plasma protein/100 ml plasma}}$$

The following is an example of the timing of the procedure and an example of the calculation

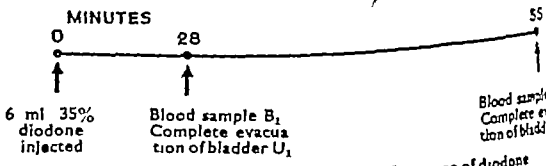

Fig 2—Determination of the renal clearance of diodone

Plasma proteins = 7 0 g /100 ml
Total diodone iodine injected = 1046 mg

—	Minutes	diodone iodine excreted (mg)	diodone iodine retained (mg)	Plasma diodone-iodine conc /100 ml (mg)	Plasma water diodone-iodine/100 ml (mg)	V_D
t_1	28	385 7	660 3	3 64	3 91	168 9
t_2	55	560 9	485 1	2 25	2 4[illegible]	[illegible]00 5

$$q = \frac{200\ 5 - 168\ 9}{55 - 28} = 1\ 1704$$

$$C_D = \frac{1\ 1704\ (\log_{10} 3\ 91 - \log_{10} 2\ 42)}{\log_{10} 200\ 5 - \log_{10} 165\ 9} - 1\ 1704 = 2\ 108$$

$$\text{Plasma diodone clearance} = \frac{2\ 108 \times 10\ 000}{(100 - 7)} = 227 \text{ ml./min}$$

MAXIMAL TUBULAR EXCRETORY CAPACITY FOR DIODONE

For determination of the T_{mD} it is necessary to know the clearance of inulin and the rate of excretion of diodone when the plasma concentration of this latter substance is sufficiently high to ensure "saturation" of the renal tubules as defined by Smith (1943) The two determinations may be made separately, or, by giving an intravenous injection of inulin immediately before the diodone, together It is necessary to consider here only the procedure with respect to diodone

Injection of Diodone

Experience shows that the required amount of diodone ranges from 350 to 200 mg per kg body weight according to the (expected) renal efficiency of the subject the greater the efficiency the greater the dose The solution used, 50% diodone (w/v) is obtainable, sterile in ampoules from Glaxo Laboratories, and an average sized subject is given 30 to 50 ml of this, at a rate not exceeding 5 ml per minute

When given in these quantities diodone occasionally produces uncomfortable side reactions which may include nausea, vomiting, tenesmus, colic, urticaria, pain faintness, fall

n blood pressure, itching, and pain over the site of the injection The incidence and severity of such reactions are, however, minimised by the prescribed slow rate of injection.

Collection and Analysis of Samples

Measuring time as usual, from the midpoint of the injection, blood and urine are collected after approximately 30 and 100 minutes, the exact times being noted For diodone (and inulin, if both determinations are made together) the method already mentioned is employed.

Calculation

The formula used is

$$T_{mD} = (C' + m)\frac{P_2VD_1^x - P_1VD_2^x}{VD_1^x - VD_2^x}$$

in which

t_1 and t_2 are the times of collection in minutes after injection.
P_1 and P_2 are the plasma water concentrations of diodone iodine in mg per 100 ml.
VD_1 and VD_2 are the "volumes of distribution" of diodone at these times expressed in hundreds of millilitres and are calculated as described for inulin

$$m = \frac{VD_2 - VD_1}{t_2 - t_1}$$

$C' = FW^2C_{In}$, where

F = that fraction of the plasma-diodone which is free in the plasma water and is therefore filterable (This depends on the total plasma-diodone concentration and the plasma albumin concentration see nomogram Smith and Smith 1938)
W = the water fraction of plasma (may be taken as 100 − plasma protein in g per 100 ml.)
C_{In} = the renal plasma-clearance of inulin expressed in hundreds of millilitres per minute

$$x = \frac{C' + m}{m}$$

With the units suggested, values for T_{mD} are obtained in milligrammes diodone-iodine excreted per minute—the conventional units

The following shows the procedure in diagrammatic form, together with an example of the calculation.

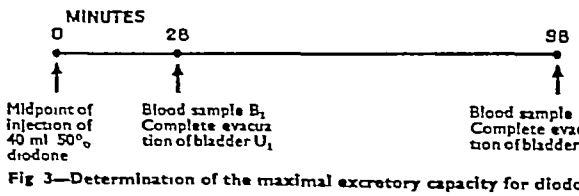

Fig 3—Determination of the maximal excretory capacity for diodone.

Amount of diodone-iodine injected 9960 mg

—	Minutes after injection	Diodone-iodine excreted (mg)	Diodone-iodine retained (mg)	Plasma diodone-iodine conc./100 ml (mg)	Plasma water diodone-iodine/100 ml. (mg)	V_D
t_1	28	1404	8556	51·6	53 5	154
t_2	98	4114	5846	29 8	32·0	183

$$m = \frac{183 - 154}{98 - 28} = 0\ 4143$$

$$C' = FW^2C_{In} = 0\ 755 \times 0\ 8649 \times 0{\cdot}672 = 0\ 4391$$

$$C' - m = 0\ 8534$$

$$\frac{C' + m}{m} = \frac{0\ 8534}{0\ 4143} = 2{\cdot}059$$

$$T_{mD} = (0\ 4391 + 0\ 8534) \times \frac{(29\ 8 \times 183)^{2\cdot059} - (51\ 6 \times 154)^{2\cdot059}}{154^{2\cdot059} - 183^{2\cdot059}}$$

$$= 19\ 7 \text{ mg diodone-iodine per minute}$$

COMBINATION OF PROCEDURES

It is clear that the determination of the renal clearance of inulin may be combined with the determination either of the renal clearance of diodone or of the maximal excretory capacity for diodone Estimation of both compounds may be made on the same blood or urine sample It is most convenient to combine the procedure for inulin clearance with that of maximal tubular excretory capacity for diodone (for which the former is in any case, required) The injection of diodone may follow immediately upon that of inulin, and both substances may be determined in the samples of blood and urine collected 30 and 120 minutes later Under these circumstances, the determination of the renal clearance of diodone (C_D) may be performed on another occasion or in the hour immediately before the determination of inulin clearance and maximal tubular excretory capacity In the latter event, the plasma diodone iodine level after 60 minutes is small enough to be ignored when the further large dose of diodone for T_{mD} determination is given

DISCUSSION

The procedures described permit estimation of the renal clearance of inulin and diodone, and the maximal tubular excretory capacity for diodone, with very little inconvenience to the patient Their general application would provide more informative data about discrete renal function than the orthodox renal function tests which estimate merely the resultant of several renal activities

Comparing the results obtained employing the formulæ described here, and those obtained employing the single injection technique and the collection of urine over short clearance periods, with direct application of the formulæ

$$\text{Clearance} = UV/P \text{ and } T_{mD} = UV - FWC_{In}P$$

we have found that they correspond well (Robson et al 1949a and b) Correspondence between the results obtained by the single injection method and the more laborious continuous infusion technique has been shown to be good only for measurements of inulin clearance and maximal tubular excretory power for diodone (Ferguson et al 1950)

A systematic error is introduced into the determination of the renal clearance of diodone by any method which involves the single injection technique when venous blood is used for sampling, because of the large arterio-venous difference in diodone iodine concentration which arises from the magnitude of the renal plasma flow relative to the cardiac output (Olbrich et al 1950) It could probably be abolished by the rather drastic procedure of adopting arterial puncture for diodone iodine, when employing the single injection method for diodone clearance This error does not, however, reduce the significance of the fractions which may be derived from the estimation of the renal functions by employing the single injection method, though it alters their magnitude as compared with those obtained by infusion techniques The great ease with which the single-injection method, combined with the formulæ given here, permits the estimation of the discrete renal functions outweighs the modification of the absolute values for derived fractions which becomes necessary

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ACTIONS AND CLINICAL ASSESSMENT OF DRUGS WHICH PRODUCE NEUROMUSCULAR BLOCK

W D M PATON
M A, B M Oxfd
MEMBER OF SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL, AT THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH

ELEANOR J ZAIMIS
M D, B Sc Athens
LECTURER IN DEPARTMENT OF PHARMACOLOGY, SCHOOL OF PHARMACY, UNIVERSITY OF LONDON

THAT decamethonium may be used clinically to produce muscular relaxation in anæsthesia and in convulsion therapy, as suggested by us (Paton and Zaimis 1948a), is now well established (Organe 1949, Davies and Lewis 1949, Hobson and Prescott 1949, Hewer et al 1949, Davies 1950) But it is clear from some reports that the fundamental differences in mechanism of action between decamethonium and drugs resembling *d* tubocurarine are not sufficiently appreciated, and that this lack of understanding may interfere with assessment of the value of such drugs

MODE OF ACTION OF DECAMETHONIUM AND *d* TUBOCURARINE

The fundamental action of decamethonium on skeletal muscle is a specific depolarisation of the muscle membrane at the motor end plate (where the motor nerve fibre ends on the muscle membrane) (Burns and Paton 1950) The first effect of this depolarisation, particularly if the decamethonium is injected rapidly into a muscle by an arterial route, is to excite a brief contraction But the depolarisation then persists and spreads to adjacent regions of the muscle Two further effects follow (1) because the end plate is already partly depolarised, a nerve impulse can no longer evoke so large an "end-plate potential" (the electrical response by which the muscle fibre is excited), and (2) the surrounding depolarised area becomes electrically inexcitable, with the result that there is a zone of inexcitable muscle membrane 2–3 mm in width between the point at which the end plate potential is set up and the nearest normally excitable part of the muscle fibre The net result of the reduction of the end plate potential, and of the inexcitability of the end plate zone, is neuromuscular block

This action of decamethonium is analogous to that exerted by acetylcholine Normally, in mammalian muscle, acetylcholine released at the nerve terminals depolarises the end plate for only a few thousandths of a second, so giving rise to the normal end plate potential, and its liberation and removal are so rapid that only excitation is seen But if acetylcholine is caused to persist either by giving anti cholinesterases or by injecting large doses into a muscle, so that the depolarisation which it causes is prolonged, neuromuscular block follows, with the same characteristics as block due to decamethonium (Zaimis 1949)

In short, it may be said that, so far as skeletal muscle is concerned, decamethonium can be regarded as an acetylcholine that cannot be hydrolysed, and its actions are the same as those of persisting acetylcholine Thus the contractions sometimes evoked by decamethonium are precisely analogous to those of any voluntary movement but are less coördinated Decamethonium does not share the other (muscarine like and ganglion-stimulating) actions of acetylcholine, but its properties are simply those exerted by acetylcholine at the myoneural synapse, displayed in singularly pure form

In contrast with decamethonium, *d* tubocurarine cannot depolarise the muscle, and its actions depend on its ability to prevent other agents, especially acetylcholine, from doing this In this way it makes the end plate potential, evoked by the discharge of acetylcholine at the nerve terminals, too small to excite the muscle fibre, although the muscle fibre is still normally excitable by electrical stimulation

The actions of decamethonium can therefore be regarded as due to an abnormally persistent end plate depolarisation, and those of *d* tubocurarine to the blocking of the *normal* depolarising action of acetylcholine, thus the mechanisms of action are diametrically opposed This is elegantly illustrated by the fact that *d* tubocurarine can antagonise the effects of decamethonium The terms "curarising" or "curariform" are now seen to be words that must be used with care, and are best restricted to those drugs which, like *d* tubocurarine, act simply by *raising the threshold of the motor end plate* to acetylcholine

CONSEQUENCES OF DIFFERENCE IN ACTION

The divergence in the ways by which decamethonium and *d* tubocurarine act inevitably leads to many detailed differences in their behaviour For instance, it follows at once that it is not to be expected that anti-cholinesterases should antagonise decamethonium, since prolongation of the action of acetylcholine in a muscle paralysed with decamethonium can do little more than intensify the block slightly So too there are many other differences in the mode of onset and passing of the paralysis, in the influence of anæsthetics, in the response to repetitive nerve stimulation, to mention only a few

The use of neuromuscular blocking agents has evolved over a period of years, around preparations containing *d* tubocurarine Decamethonium is the first, and so far the only, "depolarising" blocking agent to be used clinically A technique developed with *d* tubocurarine will therefore need adaptation if it is to be used to full advantage with decamethonium Seriously misleading results may be obtained if the differences between the drugs are not borne in mind, and the following examples have been chosen to exemplify this

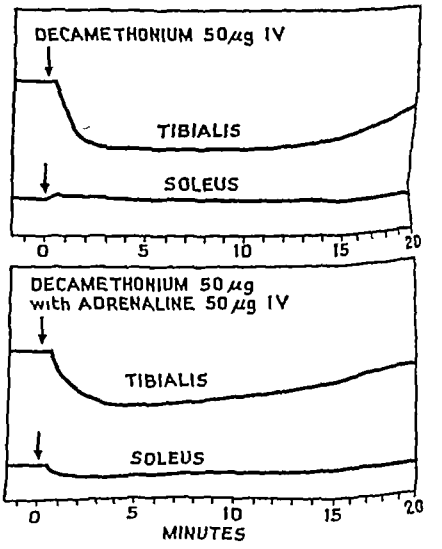

Fig 1—Tracings of maximal twitch tension from records of the contraction of tibialis and of soleus excited by single maximal nerve shocks every 10 sec. in a cat weighing 3 3 kg in chloralose anæsthesia after injections of decamethonium and of decamethonium with adrenaline

Muscle Specificity

It has long been known that muscles vary in their sensitivity to *d* tubocurarine, the muscles of the eyes, pharynx, and larynx being particularly susceptible Hence it is not surprising that decamethonium should also display differences in its effect on different muscles But the significant point is that these differences are not the same as with *d* tubocurarine Figs 1 and 2 illustrate this point on the tibialis anterior and the soleus in the cat, with *d* tubocurarine the soleus is the more easily paralysed (fig 2), whereas with decamethonium the tibialis is paralysed first (fig 1) Similarly, in the cat,

the respiratory muscles are paralysed before the tibialis with *d* tubocurarine and after the tibialis with decamethonium (Paton and Zaimis 1948b)

This varying sensitivity to the two drugs may be seen in another aspect when different species are compared We then find that in the rat, on which *d* tubocurarine is more than usually potent, decamethonium is particularly ineffective, whereas in the cat, on which *d*-tubocurarine is less effective, decamethonium reaches its highest potency

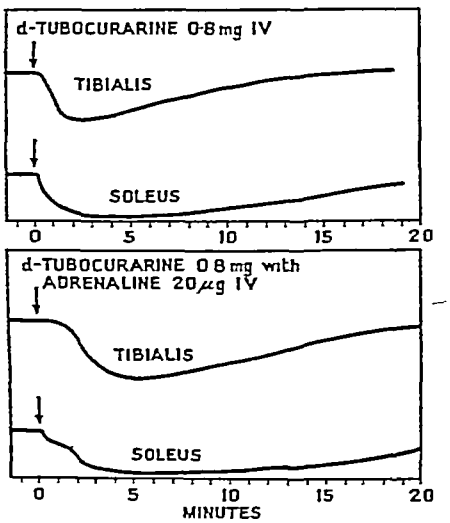

Fig 2—Tracings as fig 1 in a cat weighing 3·5 kg., in chloralose anæsthesia, after injections of *d*-tubocurarine and of *d* tubocurarine with adrenaline.

Yet another difference is that ether anæsthesia slightly potentiates *d* tubocurarine, but slightly antagonises decamethonium (Paton and Zaimis 1949)

In short, one may say that the circumstances in which *d* tubocurarine is particularly effective are likely to be those in which decamethonium is ineffective, and vice versa This inverse relationship between the two drugs springs naturally from the difference in their modes of action, and provided an important clue to that difference But it also has an important bearing on clinical comparisons between the drugs

Effects of Adrenaline

(1) In an anæsthetised animal the stimulant effects of decamethonium on a muscle are usually restricted to a few transient fasciculations, with more or less potentiation of the nerve excited muscle twitch. If a dose of adrenaline is given beforehand, however, this excitatory phase may be distinctly increased and the fasciculations become quite vigorous This effect may be observed whether the adrenaline is given arterially or intravenously, and with noradrenaline

(2) Adrenaline also influences the depth of paralysis of the muscle by decamethonium Fig 1 shows how, with the tibialis muscle of the cat, the injection of adrenaline intravenously lessens the maximum paralysis by decamethonium from 95% to 78% On the other hand, with *d* tubocurarine (fig 2) an intravenous dose of adrenaline just before the injection increases the blocking effect on tibialis from 60% to 75% block and prolongs it

(3) But these changes of potency of decamethonium and *d* tubocurarine do not affect different muscles equally or in the same direction Fig 1 shows, for instance, that with the soleus muscle adrenaline has quite opposite effects to those on tibialis, here it actually augments the action of decamethonium With *d*-tubocurarine, however, adrenaline hardly modifies the action on soleus and increases it on tibialis (fig 2)

The presence of circulating adrenaline therefore, has three effects (1) it increases the stimulant action of decamethonium (2) it changes the potency of *d* tubocurarine and of decamethonium on a given muscle, and (3) it changes the pattern of muscle susceptibility to these two drugs in opposite ways, increasing the proportionate effect of decamethonium on the "red" muscle, soleus, and decreasing that of *d*-tubocurarine on soleus There can be little doubt that tests of these compounds in conscious people will be seriously influenced by the secretion of adrenaline that accompanies trials of this nature

Idiosyncrasy

Among the precautions taken in the administration of *d*-tubocurarine is that of giving an initial small dose, so as to detect those occasional persons who are particularly susceptible to it, and who (it has been suggested) may be regarded as latent or subclinical myasthenics The same technique has been used with decamethonium (Gray 1950) But when we consider the modes of action of the two drugs, and the evidence already cited that conditions favouring the action of *d*-tubocurarine usually oppose that of decamethonium, it seems reasonable to expect that those patients who are susceptible to *d* tubocurarine would be, if anything, resistant to decamethonium Some slight support for this suggestion that there is no idiosyncrasy of this kind to decamethonium comes from the experience of Davies (1950) in which, out of 973 administrations of decamethonium, every patient required 3–5 mg, and none appeared to be particularly sensitive It would be of great interest to know what the sensitivity of a myasthenic is to decamethonium, since it would not only determine whether idiosyncrasy of this kind occurred to decamethonium but would also throw light on the pathogenesis of myasthenia

It therefore seems probable that precautionary small initial doses are unnecessary with decamethonium They may also be somewhat confusing to an inexperienced anæsthetist The effects of a small dose of decamethonium in a conscious patient with (no doubt) a liberal supply of circulating adrenaline due to the approaching operation are likely to be solely those of muscle stimulation These contractions are, as we have said above, perfectly harmless, being analogous to an incoördinated voluntary contraction, they pass off within a minute or two, or with the administration of more decamethonium

CLINICAL ASSESSMENT

The considerations and evidence which we have advanced have one particularly important consequence that, for practical purposes a comparison of the clinical usefulness of such drugs as *d*-tubocurarine and decamethonium can only be made under the conditions of actual use If it is desired to know for instance, whether one or other of such drugs has (say) less effect on the respiration than on the abdominal muscles in an anæsthetised patient, then the comparison must be made on the muscles concerned and in anæsthetised patients It is instructive to compare two attempts at such a comparison, with this requirement in mind.

The first is that of Davies and Lewis (1949) who wished to compare the effects on the respiration of decamethonium and *d*-tubocurarine when given to abate the convulsions of shock therapy The comparison was made directly, in the course of normal treatment By a simple but careful system of scoring the intensity of the convulsions, doses of each drug which were equally active were obtained using these doses, these workers determined the maximum inspiratory capacity of the patients just before the convulsion They found that, for the third and fourth minutes after the injection this was 1160 c cm and 1110 c cm respectively with decamethonium, and 835 c cm and 700 c cm with *d*-tubocurarine (average of six patients) This was not an elaborate study but its findings were clear and directly applicable to practice, they have been borne out by later experience It remains the only satisfactory clinical comparison yet made between two such drugs

ACTIONS AND CLINICAL ASSESSMENT OF DRUGS WHICH PRODUCE NEUROMUSCULAR BLOCK

W D M PATON
M.A, B.M Oxfd
MEMBER OF SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL, AT THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH

ELEANOR J ZAIMIS
M.D, B Sc Athens
LECTURER IN DEPARTMENT OF PHARMACOLOGY, SCHOOL OF PHARMACY, UNIVERSITY OF LONDON

THAT decamethonium may be used clinically to produce muscular relaxation in anæsthesia and in convulsion therapy, as suggested by us (Paton and Zaimis 1948a), is now well established (Organe 1949, Davies and Lewis 1949, Hobson and Prescott 1949, Hewer et al 1949, Davies 1950) But it is clear from some reports that the fundamental differences in mechanism of action between decamethonium and drugs resembling *d* tubocurarine are *not sufficiently appreciated, and that this lack of understanding* may interfere with assessment of the value of such drugs

MODE OF ACTION OF DECAMETHONIUM AND *d* TUBOCURARINE

The fundamental action of decamethonium on skeletal *muscle is a specific depolarisation of the muscle membrane* at the motor end plate (where the motor nerve fibre ends on the muscle membrane) (Burns and Paton 1950) The first effect of this depolarisation, particularly if the decamethonium is injected rapidly into a muscle by an arterial route, is to excite a brief contraction But the depolarisation then persists and spreads to adjacent regions of the muscle Two further effects follow (1) because the end plate is already partly depolarised, a nerve impulse can no longer evoke so large an "end plate potential" (the electrical response by which the muscle fibre is excited), and (2) the surrounding depolarised area becomes electrically inexcitable, with the result that there is a zone of inexcitable muscle membrane 2–3 mm in width between the point at which the end plate potential is set up and the nearest normally excitable part of the muscle fibre The net result of the reduction of the end plate potential, and of the inexcitability of the end plate zone, is neuromuscular block

This action of decamethonium is analogous to that exerted by acetylcholine Normally, in mammalian muscle, acetylcholine released at the nerve terminals depolarises the end plate for only a few thousandths of a second, so giving rise to the normal end plate potential, and its liberation and removal are so rapid that only excitation is seen But if acetylcholine is caused to persist either by giving anti-cholinesterases or by injecting large doses into a muscle, so that the depolarisation which it causes is prolonged, neuromuscular block follows, with the same characteristics as block due to decamethonium (Zaimis 1949)

In short, it may be said that, *so far as skeletal muscle* is concerned, decamethonium can be regarded as an acetylcholine that cannot be hydrolysed, and its actions are the same as those of persisting acetylcholine Thus the contractions sometimes evoked by decamethonium are precisely analogous to those of any voluntary movement but are less coördinated Decamethonium does not share the other (muscarine like and ganglion-stimulating) actions of acetylcholine, but its properties are simply those exerted by acetylcholine at the myoneural synapse, displayed in singularly pure form

In contrast with decamethonium, *d* tubocurarine cannot depolarise the muscle, and its actions depend on its ability to prevent other agents, especially acetylcholine, from doing this In this way it makes the end plate potential, evoked by the discharge of acetylcholine at the nerve terminals, too small to excite the muscle fibre, although the muscle fibre is still normally excitable by electrical stimulation

The actions of decamethonium can therefore be regarded as due to an abnormally persistent end plate depolarisation, and those of *d tubocurarine to the blocking of the normal depolarising action of acetylcholine*, thus the mechanisms of action are diametrically opposed This is elegantly illustrated by the fact that *d* tubocurarine can antagonise the effects of decamethonium The terms "curarising" or "curariform" are now seen to be words that must be used with care, and are best restricted to those drugs which, like *d* tubocurarine, act simply by raising the threshold of the motor end plate to acetylcholine

CONSEQUENCES OF DIFFERENCE IN ACTION

The divergence in the ways by which decamethonium and *d* tubocurarine act inevitably leads to many detailed differences in their behaviour For instance, it follows at once *that it is not to be expected that anti cholin* esterases should antagonise decamethonium, since prolongation of the action of acetylcholine in a muscle paralysed with decamethonium can do little more than intensify the block slightly So too there are many other differences in the mode of onset and passing of the paralysis, in the influence of anæsthetics, in the response to repetitive nerve stimulation, to mention only a few

The use of neuromuscular blocking agents has evolved over a period of years, around preparations containing *d* tubocurarine Decamethonium is the first, and so far the only, "depolarising" blocking agent to be used clinically A technique developed with *d*-tubocurarine will therefore need adaptation if it is to be used to *full advantage* with decamethonium Seriously misleading results may be obtained if the differences between the drugs are *not* borne in mind, and the following examples have been chosen to exemplify this

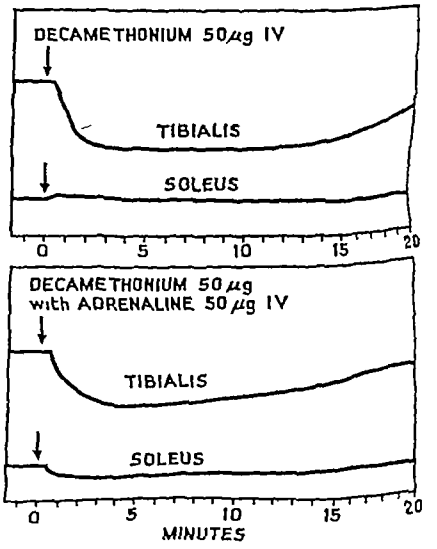

Fig 1—Tracings of maximal twitch tension from records of the contraction of tibialis and of soleus excited by single maximal nerve shocks every 10 sec. in a cat weighing 3 3 kg in chloralose anæsthesia after injections of decamethonium and of decamethonium with adrenaline

Muscle Specificity

It has long been known that muscles vary in their sensitivity to *d* tubocurarine, the muscles of the eyes, pharynx, and larynx being particularly susceptible Hence it is not surprising that decamethonium should also display differences in its effect on different muscles But the significant point is that these differences are not the same as with *d* tubocurarine Figs 1 and 2 illustrate this point on the tibialis anterior and the soleus in the cat, with *d tubocurarine* the soleus is the *more easily* paralysed (fig 2), whereas with decamethonium the tibialis is paralysed first (fig 1) Similarly, in the cat,

The dosage of TBI-69S is small by comparison with that of P.A.S 200 mg of TBI 69S per day (or exceptionally 300 mg) is generally regarded as the maximum The method described here has therefore been designed to record even low blood levels of the drug

METHOD

Solutions—The following are needed

1 Stock solution of TBI-69S A commercial sample of this substance is recrystallised twice from *n* butyl alcohol, and the solution is prepared by dissolving 50 mg of TBI-69S in 100 ml of absolute ethyl alcohol. Since thiosemicarbazones of this type are photolabile the solution should be stored in a dark cupboard.
2 Standard solution of TBI-69S Prepared by diluting 20 ml. of the stock solution to 100 ml. with water Store in the dark.
3 20% trichloracetic acid.
4 0 2 N sulphuric acid
5 0-02% sodium nitrite. Prepared freshly by dilution of a 0 5% solution which is stored in the ice-chest
6 0 5% dimethyl-α naphthylamine Prepared by dissolving 0 5 ml. of the amine in 100 ml of absolute ethyl alcohol

Technique—1 ml. of serum, plasma, or whole blood, is mixed with 3 2 ml of water and 0-8 ml. of 20% trichloracetic acid is added slowly with agitation. The mixture, after standing for a few minutes is centrifuged, or filtered through a small filter paper 2 ml of filtrate is placed in a 10 ml. graduated centrifuge tube or in a test-tube which has been calibrated at 4 ml by means of a diamond pencil. 0-5 ml. of 0-2 N sulphuric acid is added and the tube placed in a boiling water bath for 45 min. The tube is then cooled under the tap and 0-5 ml of 0-02% sodium nitrite solution is added. After standing for 3 min. 1 ml. of 0-5% dimethyl-α naphthylamine is added, and the final volume is adjusted to 4 ml. with distilled water Removal of excess nitrous acid by urea or ammonium sulphamate is unnecessary under these conditions

The colour develops almost at once and is stable for some time if not exposed to direct sunlight. The coloured compound absorbs light maximally at 530 mμ, and a green filter should be used in the colorimeter, a Chance O G 1 filter is suitable A standard is carried through simultaneously by substituting for blood 1 ml. of standard TBI 69S solution. A reagent blank may also be prepared by replacing the blood by 1 ml. of water but the values so obtained have been negligibly small.

With a Hilger 'Biochem' absorptiometer, the method has proved satisfactory down to levels of 0-4 mg per 100 ml. blood. Development of the final colour depends on the concentration of acid present, and hydrolysis of the *p* acetamidobenzaldehyde thiosemicarbazone must be carried out under less strongly acid conditions than are used in the estimation of acetylated sulphonamides (Bratton and Marshall 1939) The colours obtained with TBI 69S are considerably stronger than those for the corresponding concentration of P.A.S

RESULTS

The proportions recovered when TBI 69S was added to 1 ml plasma were as follows

Added (μg)	Recovered μg	Proportion of amount added (%)*
6-0	5-4	90
10-0	8 9	89
12-0	10 2	85
20-0	17-6	88
30-0	26 4	88

* Mean recovery 88%

Since the substance is very sparingly soluble in water it must presumably, like P.A.S , be carried in the blood-stream in association with protein. The efficacy of any method for its estimation will therefore depend on the way in which the protein is precipitated.

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Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

Annual Meeting

THE annual meeting of the association was held in London on Oct 26, 27, and 28, under the presidency of Mr S L HIGGS

Place of Femoral Lengthening in Leg Equalisation—Mr DENYS WAINWRIGHT (Newcastle) discussed the problem of leg equalisation in such conditions as poliomyelitis, congenital short femur, and premature epiphysial fusion *Femoral lengthening had been a controversial subject* but he believed that it had a definite place in treatment Among 25 patients who had been operated on the average gain in length was 2 in. Complications included delayed union 1, stiffness of the knee 2, and temporary nerve paralysis 2 There were no vascular complications Mr F G ALLAN (Birmingham) agreed that knee stiffness presented a real problem

Immobilisation Osteoporosis—Dr HARWOOD STEVENSON (Stanmore) had studied the radiographs of 100 patients submitted to long immobilisation for various diseases, and had found that the process of osteoporosis followed a typical pattern irrespective of the nature of the primary disease Immobilisation osteoporosis developed rapidly and might be obvious within six weeks But if mobility was maintained disease might be present in a limb for many months without leading to marked osteoporosis These observations suggested that osteoporosis was a consequence of immobilisation as such rather than of disease

Osteoporosis and Epiphysial Changes in Diseased and Immobilised Limbs—Dr H A. SISSONS had studied the gross and microscopic structure of bone obtained from osteoporotic limbs and from the site of prematurely fused epiphyses Examination of trabecular structure was aided by radiographs of thin bone sections In areas of bone atrophy osteoclasis and osteoblastic new-bone formation proceeded concurrently Hyperæmia was not evident. In sections from areas of premature epiphysial fusion there was disruption of the epiphysis into the diaphysis and bony bridging of the epiphysial line. The evidence suggested that the process of atrophy during immobilisation was one of osteoporosis in the strict sense of the word, and was not simply a halisteresis The process was not due to hyperæmia alone. Mr H JACKSON BURROWS said that in normal bone there was a continual and balanced process of absorption and laying down of bone. In disuse atrophy there was diminished replacement of bone, and increased absorption. The stimulus responsible for this was unknown Vascularity had little to do with it, and it was noteworthy that a general stimulus might affect only local areas of bone

Curve Patterns in Idiopathic Structural Scoliosis—Mr J I P JAMES recalled that recent work in America had shown that the pattern of the curve in idiopathic scoliosis was the key to the prognosis He reported a study of the typical features and prognosis in two curve patterns—infantile idiopathic scoliosis and primary lumbar idiopathic scoliosis In infantile idiopathic scoliosis the prognosis had been assessed from analysis of 33 cases Exceptionally a curve that was initially slight might disappear a few might remain stationary, but most curves progressed and led to severe deformity Treatment was very unsatisfactory Primary lumbar idiopathic scoliosis had a benign course correction was not required However pain, developing in middle life from osteo-arthritis was much more common in this than in other patterns of scoliosis If not relieved by a suitable corset, fusion (without correction) might be required Mr H OSMOND CLARKE remarked that study of the curve patterns simplified prognosis but not treatment Infantile scoliosis was a ferocious problem to which no solution was known All patients with scoliosis should be segregated in specially equipped clinics

Experimental Causation of Congenital Defects—Dr P K DURAISWAMI (Liverpool) illustrated experiments in which insulin had been injected into the yolk of fertilised hens eggs A high proportion of the chickens developed congenital deformities which often affected

In contrast one may cite the relatively complicated experiments of Unna et al (1950) These workers wished to assess the usefulness in surgical anæsthesia of three blocking agents, paying particular attention to the respiratory effects They were careful to emphasise the danger of arguing from experiments on one species to another, but they underestimated the equally great danger of arguing from one muscle to another So far from studying the abdominal muscles, they chose the muscles of the hand for analysis They obtained, as doses giving 95% paralysis of the grip strength, the following average doses for a man weighing 70 kg *d* tubocurarine chloride 9 4 mg , decamethonium iodide 2 8 mg If these doses are compared with the amounts that have been found to give equivalent maximum relaxations in anæsthesia (*d* tubocurarine chloride 15 mg , decamethonium iodide 3 mg), it is seen at once that the hand must be relatively more sensitive than the abdominal muscles to *d* tubocurarine Roughly speaking, then, the dose of *d* tubocurarine required to paralyse the hand was only 65% of that needed for abdominal relaxation, whereas for decamethonium the dose was 95% of the effective dose for anæsthesia The comparison of the effects on the respiration was therefore between a full anæsthetic dose of decamethonium and a two thirds anæsthetic dose of *d* tubocurarine Such a comparison is obviously irrelevant to the conditions of surgical anæsthesia, although of some interest for manual physiology

Further, instead of using anæsthetised persons, Unna et al used conscious volunteers, in whom adrenaline must have been secreted in appreciable amounts (these workers themselves state that " an increase in pulse rate and blood pressure in the subjects was seen frequently during the first few minutes after the injection of any of the drugs ") We have shown how circulating adrenaline profoundly alters the comparison between decamethonium and *d* tubocurarine, in a way which seems likely to increase the respiration sparing effects of *d* tubocurarine and to decrease those of decamethonium The comparison by Unna et al was made under conditions different from those of anæsthesia and probably those least favourable to decamethonium To the presence of circulating adrenaline may be attributed also the muscular twitches and muscle cramps recorded with decamethonium by these observers We ourselves observed in the first trials of decamethonium (Organe et al 1949) that the incidence of the cramps was in proportion to the rise in blood pressure during the experiment

It is clear, therefore, that the experiments by Unna et al, through an unfortunate chance, were made in such a way that the respiratory depressant effects of decamethonium were likely to be exaggerated, its muscle specificity reduced, and its muscle stimulating action increased It is not surprising that these workers were unable to confirm the finding of Davies and Lewis (1949) that decamethonium has a less depressant action than has *d* tubocurarine on respiration

DISCUSSION

We have emphasised particularly the difficulties in making comparisons between *d* tubocurarine and decamethonium But the difficulties of assessments of this sort are not restricted to these two drugs, they will appear when any two or more drugs that produce neuromuscular block are studied, and will certainly also have to be faced in the clinical evaluation of the dimethyl ether of *d* tubocurarine, and of 'Flaxedil,' not to mention that of the blocking agents still to be discovered Although it is considerably harder to make quantitative comparisons during clinical practice than in the laboratory, there seems no escape from the conclusion that either this task must be undertaken or we must remain in doubt about the relative usefulness of these drugs in practice Such trials, however, have an interest greater than that of simple clinical evaluation of a new medicament, for they reveal differences between the drugs that may be, in time, capable of exploitation in other directions, in particular, it seems possible that the varying muscle specificity may prove useful. Further, there is slowly accumulating a substantial body of information relating the physiology of the human neuromuscular junction—about which we have little detailed knowledge—to the well established and extensive information at our disposal in animals

SUMMARY

Decamethonium and *d* tubocurarine cause neuromuscular block by fundamentally different mechanisms Block by decamethonium is due to a persistent end plate depolarisation, analogous to an exaggeration of the normal excitant action of acetylcholine; block by curare is due to an antagonism to the normal action of acetylcholine

These differences in mode of action reveal themselves in many ways, particularly in differing muscle susceptibility Further, circulating adrenaline modifies the pattern of muscle susceptibility both of *d* tubocurarine and of decamethonium

The relevance of these findings to clinical assessment of such drugs is discussed Such assessment can be valid only if made under the actual conditions in which the drug is to be used

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COLORIMETRIC ESTIMATION OF *p*-ACETAMIDOBENZALDEHYDE THIOSEMICARBAZONE IN BLOOD

D G Moss
M Sc Manc
BIOCHEMIST, WITHINGTON HOSPITAL MANCHESTER

THE German drug, *p* acetamidobenzaldehyde thiosemicarbazone ('TBI 698' or 'Conteben') has given promising results in the treatment of some forms of tuberculosis (Hinshaw and McDermott 1950, *Lancet* 1950, Mertens and Bunge 1950) This substance, which is now manufactured in Great Britain, is potentially highly toxic, and since treatment may be continued for 6–12 months careful supervision is essential

Ultraviolet absorption spectroscopy was used by Spinks (1949) to measure in mice the blood level of substituted benzaldehyde thiosemicarbazones prepared by Hoggarth and his co workers (1949), but comparable figures for TBI 698 in man do not seem to have been published In contrast to many of the thiosemicarbazones whose chemotherapeutic activities were examined by Hoggarth et al, the colorimetric estimation of TBI 698 is comparatively simple, since it can be hydrolysed to the corresponding derivative of *p* aminobenzaldehyde, which is then diazotised and coupled with a suitable aromatic amine This method is not specific for TBI 698, for *p* aminosalicylic acid (P A S) and the sulphonamides will also give colours However, the concurrent administration of sulphathiazole, which was practised in the early German work, has been abandoned because of toxic effects

strated new types of elbow-crutch and walking-stick which have been developed at the Birmingham Accident Hospital

Pigmented Villonodular Synovitis—Mr G R FISK had studied 6 cases of pigmented villonodular synovitis—a condition affecting a single joint, usually the knee It occurred in two forms, generalised and localised The generalised form was often preceded by injury and was characterised by persistent swelling and effusion of the joint, which might resemble a tuberculous infection Pathologically, the synovium was greatly thickened and chocolate-brown in colour In early cases the thickened villi gave a matted seaweed appearance Later there was generalised thickening with formation of nodules Histologically, the main features were proliferation of surface cells, marked vascularity, proliferation of connective tissue, intracellular and extracellular deposits of hæmosiderin and lipoid, and frequent reticulo-endothelial cells Treatment was by synovectomy, and provided removal was complete the prognosis was good The localised form, sometimes termed benign synovioma, occurred as a circumscribed nodule, often near the joint-line. If pedunculated it might cause recurrent locking of the joint suggestive of a cartilage tear Treatment was by excision of the nodule.

Actinomycosis of Bone—Mr V ZACHARY COPE reviewed the characteristic features of actinomycosis with particular reference to bone infection. He emphasised that the actinomyces found so commonly in the soil seldom caused human or animal disease and that the causative organism was almost invariably derived from the human digestive tract The bone most commonly affected was the mandible In the spine, any area of which might be affected, actinomycosis usually attacked the superficial parts of the bone, but unlike tuberculosis it commonly involved the transverse or costal processes as well as the vertebral body Collapse of the body was exceptional and the intervertebral disc was resistant to infection, so deformity was slight Early diagnosis was important, for if left untreated the disease proved fatal within two or three years, whereas if it was treated efficiently by very large doses of penicillin or streptomycin, supplemented by blood-transfusion and general therapy, there was a good prospect of permanent cure

Internal Fixation of the McMurray Osteotomy with a Trifin Nail—Mr ROBERT ROAF (Liverpool) had devised a simple method of internal fixation of the femoral fragments after displacement osteotomy of the McMurray type The method consisted in driving a long trifin nail from the tip of the greater trochanter downwards and medially into the upper part of the shaft fragment

Controlled Pseudarthrosis for Fracture of the Neck of the Femur—Mr E MERVYN EVANS (Swansea) described a method of treating ununited fractures of the neck of the femur which was applicable to very frail patients He recalled that when osteotomy failed to stimulate union of the fracture a relatively painless pseudarthrosis might develop at the site of the fracture and might give reasonable function He had attempted to produce such a pseudarthrosis deliberately by encouraging movement after osteotomy while ensuring fixation and union at the site of osteotomy by internal fixation

Generalised Bone Decalcification—Dr C E DENT gave an account of some of the rarer forms of generalised bone decalcification, and particularly the uncommon cases of rickets or osteomalacia which were resistant to vitamin D He believed that in all these cases the primary cause was impaired reabsorption by the renal tubules In one type there was simply impaired reabsorption of phosphates (low renal threshold for phosphates) with consequently a low level of phosphates in the blood and a high level in the urine In a second type this abnormality was accompanied by a lowered renal threshold for glucose with consequent glycosuria and this merged into a third type in which there was also impaired reabsorption of amino acids, which appeared in the urine (Fanconi type, cystine rickets) These conditions were inherited A further type, distinct from the above and not inherited, was that in which the renal tubules were unable to make ammonia and excrete an acid urine Acidosis occurred, and calcium might be deposited in the kidneys The skeletal changes were the same whatever the nature of the tubular insufficiency

Reviews of Books

Blood Groups in Man

R R RACE, PH.D Camb, M.R.C S, director, Medical Research Council Blood Group Research Unit, London, RUTH SANGER, PH.D Lond, a member of the unit Foreword by Prof R A FISHER F.R S Oxford Blackwell Scientific Publications 1950 Pp 290 30*s*

TO serologists geneticists and medicolegal specialists the blood-groups are a valuable tool, to clinicians and to many pathologists they are a necessary evil. Both categories, however, need to be informed of the great advances of the past ten years, and they will agree in welcoming this up to-date book. On the clinical and anthropological aspects of the subject the publishers promise separate works, but outside these confines it is remarkably comprehensive It includes even the Duffy blood groups, only announced this year, and an account, incorporating work done only a few weeks before the book was published, of a possible deletion in a human Rh chromosome

The general arrangement is historical the blood-group systems are described in the order in which they were discovered and there is a clear account of the discovery of each The authors were themselves personally concerned in the discovery of many blood-group antigens but they discuss their own work as objectively as the rest, indeed if they have a fault it lies in their occasional failure to point out that other workers sometimes base conclusions on criteria less rigid than those they use themselves More than two-fifths of the text is devoted to the Rh factor and methods of Rh testing Direct clinical applications of blood-group investigation are only briefly touched on, but the scientific background of these applications is fully demonstrated Evidence for the mode of inheritance of each blood group antigen is critically assessed, and there is a valuable chapter on medicolegal applications

Ophthalmic Operations

SEYMOUR PHILPS F.R C S, surgeon in-charge of the eye department St Bartholomew s Hospital surgeon to the Moorfields Westminster, and Central Hospitals London Baillière Tindall & Cox 1950 Pp 390 50*s*

NOTHING but the title of the old "Grimsdale and Brewerton" remains here Mr Philps's book is beautifully illustrated by his own drawings and photographs The text as a whole may not please everybody for the style is often colloquial, and there is some unnecessary repetition of the precautions to be observed in intra-ocular surgery The descriptions of many operations are hardly detailed enough for postgraduates, and not every ophthalmic surgeon would agree with all the statements—for instance, that the only contra indication to intracapsular extraction is that the patient is less than 50 years of age—or with all the techniques recommended The account of the pathology and morbid histology of glaucoma and hydrophthalmia is in places confusing, and perhaps too little space is given to reconstructive (plastic) surgery, leading to the omission of points that deserve attention On the other hand, Mr Philps's descriptions of the selection and care of instruments, and the emphasis he gives to the details of strict aseptic care in the preparation and conduct of eye operations, are admirable, and the high quality of the illustrations make this book a valuable guide for ophthalmic surgeons

The Child and the Magistrate

JOHN A F WATSON London Cape 1950 Pp 367 12*s* 6*d*

THE chairman of the South East London Juvenile Court has produced an outstandingly intelligent and well-informed study of his work in dealing with delinquent children. There have been few studies which present in such readable and critical terms the exact problem which such a court, balancing the requirements of law and fair trial and the welfare of the child, has to face Mr Watson is fully aware of the value as well as the limitations of the psychiatrist's report, and moreover he emphasises the importance of the bench's

the skeleton The type of deformity depended on the timing of the injection thus injection during the first two days of incubation caused defects of the vertebral column, on the third day, the feet, on the fourth to fifth day, the limbs and beak Abnormalities that had been produced included spina bifida, scoliosis, club-foot, dislocations of the knees, pseudarthrosis, osteogenesis imperfecta, achondroplasia, and chondro-osteodystrophy It seemed that the injected substance affected organs at the time of their maximal development there was a critical period for each organ In a few instances deformities had recurred in the next generation Once the tendency to deformity had been induced deformity occurred even if subsequent development took place in an environment free from insulin But the development of deformity could be prevented by injection of nicotinamide and riboflavine

Sprung Back—Mr P H NEWMAN described recent investigations into the pathology of a common clinical type of low back pain characterised by onset in young adults, often preceded by injury, increase of pain on flexion and relief with extension, and local midline tenderness and a palpable depression between two adjacent lower lumbar spinous processes without other objective findings He believed that the underlying cause was disruption of the posterior intervertebral structures by a flexion injury Healing by fibrosis occurred, but full stability was not regained Once the back had been sprung painful redisplacement might take place whenever the protective extensor muscles were off their guard

RECONSTRUCTIVE SURGERY

Mr NORMAN CAPENER (Exeter), introducing a symposium on reconstructive surgery in poliomyelitis, recalled that disability might depend on many factors which must all be borne in mind in approaching the problems of reconstruction It was equally important that there should be a full understanding of the applied physiology of muscle and joints if the most effecient use of the remaining muscle power was to be achieved

Soft-tissue Operations in the Lower Limb—Mr J P CAMPBELL (Nottingham) discussed the rôle of soft-tissue reconstructive operations in poliomyelitic paralysis in the foot and calf Tendon transplants alone or as accessories to joint stabilisations were of definite value Prerequisites to successful tendon transplantation were free passive movement in the joint to be activated, adequate power in the muscle to be transplanted, direct attachment of the transplant to bone, and a reasonably direct course of the transplant from origin to insertion

Reconstructive Surgery in Childhood—Miss M FORRESTER-BROWN (Bath) recalled that some years ago she had pleaded for stabilisation of deformed feet early in childhood, but it had been argued against her proposal either that fusion was not obtained or that feet so stabilised did not grow In her experience these criticisms were unfounded for fusion was in fact obtained, and provided only the articular part of the cartilage was removed growth continued

Subtaloid Arthrodeses—Mr T T STAMM reviewed the important part played by tarsal fusion operations in stabilising paralysed and deformed feet Any foot could be stabilised by triple tarsal fusion Because the foot was hinged behind its centre it was usually desirable to displace the foot backwards (as in the Naughton Dunn operation) as part of the triple fusion operation, to prevent the tendency for the forefoot to drop downwards For simple drop foot the Lambrinudi type of tarsal fusion, in which an anterior wedge is removed from the subtaloid joint, was very satisfactory Reversed drop foot or calcaneus deformity was well corrected by a reverse type of Lambrinudi procedure in which most of the bone wedge should be taken from the calcaneus The late results in thirty-two cases of tarsal arthrodesis were presented by Mr A J DREW From the point of view of function the results were highly satisfactory, but the appearance of the foot was often less pleasing There was freedom from pain in 74% of cases

Elmslie's Operation for the Calcaneus Foot—Mr J A. CHOLMELEY (Stanmore) reviewed the important features of Elmslie's operation for calcaneus deformity of the foot The operation was done in two stages At the first stage cavus deformity of the foot was corrected by soft-tissue stripping and talonavicular arthrodesis, and the foot was immobilised in plaster in extreme dorsifl At the second stage the posterior part of the sub joint was arthrodesed through a posterior approac longitudinal strip of the tendo achillis was attached back of the tibia, to give a tenodesis effect with th in 20° of equinus, and the calf muscles were reinf by transfer of tibialis posterior, flexor digitorum lo flexor hallucis longus, and peroneï longus and bre the back of the calcaneus

Discussion—Mr S A S MALKIN (Nottingham) that two of the greatest problems in the reconstru surgery of poliomyelitis were paralysis of the gl medius and paralysis of the quadriceps In gl medius paralysis he had been dissatisfied with the re of the various tendon transfers In quadriceps par the merits of hamstring transfers had been disp but in his opinion they were of definite value He not consider that any reconstructive operation be regarded as entirely satisfactory unless it reduc eliminated the need for appliances

Mr ERIC LLOYD had studied the late results in series of cases operated on many years ago for calca deformity In the first series the Elmslie operation been used, in the second the reverse Lambrinudi o tion There was very little to choose between the re in the two series He suggested that neither opera should be done in children under the age of ten y

Mr H H LANGSTON (Winchester) felt that the be care now being given to patients in the early stage poliomyelitis might reduce the proportion of c requiring reconstructive operations

Mr E S EVANS (Alton) referred to the use of lum ganglionectomy as a means of improving the periph circulation and reducing such troublesome complicat as chilblains He considered that ganglionectomy too often been condemned because too much expected of it It was true that the dramatic im improvement in the circulation was not maintained, the circulation never returned to a state as bad as bef operation His technique had included removal of second, third, and fourth lumbar ganglia After t operation decrease of the relative shortening of the lim had been observed in one patient He proposed to exte the operation to include the removal of the first lumb ganglion Through improving the circulation in th more proximal part of the limb it was possible that greater stimulation of growth might be achieved

OTHER SUBJECTS

Research on the Transport and Multiplication of Virus—Mr KINGSLEY SANDERS (Oxford) had studied t behaviour of a virus causing encephalitis in mice, w particular reference to its transport and multiplicati in the body Since the lesions produced by the vir and certain other features of its behaviour, were clos similar to those of the virus of poliomyelitis, he believ that his researches might have a bearing on the transp and multiplication of the poliomyelitis virus itself

Fracture-dislocation of the Foot—Mr W GISSA (Birmingham) drew attention to the risk of circulatc arrest in the foot after dislocation of the tarsometatar joints with multiple metatarsal fractures—the Lisfra fracture-dislocation He believed that the bone inju was caused by excessive rotational violence rather th by direct violence He advocated immediate operati reduction, the first step in which should be to secu accurate reduction of the medial and middle cuneifor metatarsal joints

Fractures of the Radial Head with Inferior Radio ulna Dislocation—Mr P ESSEX LOPRESTI (Birmingham described an uncommon forearm injury of which he ha observed two cases The injury was a comminuted fra ture of the head of the radius associated with upwar displacement of the radius relative to the ulna, man fested at the wrist by dislocation or subluxation of th inferior radio ulnar joint It was caused by a forc acting longitudinally in the axis of the forearm Althoug this injury was uncommon its recognition was importan because if the head of the radius was excised the radio ulnar subluxation was liable to persist or increase Recon struction of the head of the radius after reduction of th subluxation was probably the treatment of choice

Birmingham Type of Light Metal Elbow crutch and Walking stick—Mr F G BADGER (Birmingham) demon

destroy *Leishmania donovani*, an organism closely resembling toxoplasma in appearance and habits

Few opportunities have arisen in this country for studying a series of cases of toxoplasmosis, and most of the information comes from SABIN and his co workers in America This issue contains a paper on the disease from Scotland and two from north-west England, where some of the first cases were recognised by FARQUHAR and TURNER Dr FARQUHAR now reports the infection in binovular twins, one having overt clinical and radiological signs, whereas the second had serum antibodies in high titre but only minimal clinical signs Congenital defects caused by maternal rubella have also been found in one twin when the other seemed normal We know practically nothing about the transfer of toxoplasma parasites to the fœtus, but if both these infants were exposed to the infection in utero they presumably had equal chances of acquiring frank clinical toxoplasmosis It may be that definite involvement of placental tissue always precedes invasion of the fœtus, or that previous structural damage is essential if the infection is to gain a footing One fœtus might then be infected before the other, and the second would derive greater benefit from the rapidly developing antibodies in the maternal circulation The pathogenesis of the congenital disease is discussed by Dr MACDONALD who attempts to reconcile the widespread subclinical infection in adults with the comparatively rare disease which produces severe destructive lesions in the nervous tissues of the fœtus It seems reasonable to suppose that the fœtus is more likely to acquire toxoplasmosis if the mother is herself infected during pregnancy, but there is no direct proof of this the mothers of infected children often give no history of illness in pregnancy, but it is often difficult to obtain a history of illness from adults who have serological evidence of contact with the parasite If adults carry the toxoplasma for a short time this might explain why usually only one child in a family is affected But most other protozoa tend to persist in the tissues and it seems more likely that in subsequent pregnancies the fœtus is protected by neutralising antibodies in the mother's blood, and thence in the cord blood

Less than a dozen cases of congenital toxoplasmosis have previously been described in the British Isles, though the case reported by Dr RILEY and Dr ARNEIL recalls that the disease is not confined to one area From the serological tests on 100 suspected cases reported by Dr MACDONALD we can gather some thing of the incidence of the disease in north west England Of 12 children with both chorioretinitis and cerebral calcification 10 gave positive serological tests, whereas there were only 4 positives among 88 suspected children who did not have both these signs It is unwise to select patients for laboratory investigation by hard and fast rules, but sign posts are useful in a field where there are many conditions with superficial resemblances Moreover, as SABIN and FELDMAN [4] have pointed out, not all patients with chorioretinitis and cerebral calcification are infected with toxoplasma Nevertheless, this combination of signs is a useful pointer, even though subsequent laboratory confirmation is essential MACDONALD found complement-fixing antibodies in about 5% of normal adults, and the American results with dye and skin tests suggest considerably higher figures for symptomless infection Thus a positive serological test in the mother may not tell us the nature of her infant's infection, and the transfer of maternal antibody to the fœtus makes positive results in the first weeks of life of doubtful significance In seeking laboratory confirmation of a clinical diagnosis, samples of serum from both mother and child should always be examined and if necessary these tests must be repeated when the child is over three months old Manifest toxoplasmosis is uncommon, but as a cause of severe lesions in infants and one of our few indigenous protozoal diseases it should be kept in mind not only by pædiatricians but by all concerned with preventive medicine

4 Sabin A B Feldman H A *J Pediat* 1949 35 296

Annotations

RHEUMATIC CARDITIS

THE pharyngitis which commonly precedes attacks and recurrences of acute rheumatic carditis in children is almost certainly due to infection by β hæmolytic streptococci, and it is highly significant that when the carditis is active the serum contains precipitins to Lance field's M substance—an antigenic protein abundant in the cells of the group A streptococci responsible for most acute pyogenic inflammations in man

The rheumatic child deals with his throat infection in a peculiar way Specific antibody production goes on continuously for months, whereas in uncomplicated streptococcal tonsillitis it ceases in a week or two The streptococci lie deep in the pharyngeal submucosa, and despite innumerable attempts group A streptococci have never been cultivated from the blood Furthermore, the inflammatory reaction in the heart bears no histological resemblance to acute streptococcal inflammation and contains no streptococci We may assume, therefore, that the rheumatic child develops a considerable degree of antibacterial immunity to the antigen locked up in the bodies of pyogenic cocci which remain immured deep in the pharynx, and that the carditis results from liberation into the blood of a soluble streptococcal antigen

Acute rheumatism in children follows a pathogenetic pattern which is becoming increasingly familiar a focal infection, due to a micro organism which never invades the blood stream, and whose chief offensive weapons are soluble endotoxins, is followed by the continuous production of anti endotoxic antibodies and by non bacterial inflammation of the connective tissue of a deeply placed organ or tissue These are precisely the conditions under which such inflammation, sometimes severe, can be produced in animals We now know that the administration of the pituitary adrenocorticotropic hormone influences not only acute rheumatic carditis but several other diseases with a similar pathogenesis, and this hormone also abolishes the tissue hypersensitiveness of the tuberculous animal to tuberculin These facts strengthen the case for regarding acute rheumatic carditis as an example of specific hypersensitiveness of the cardiac connective tissues to an antigen contained in group-A streptococci This hypothesis would be further and greatly strengthened if cardiac inflammation histologically identical with rheumatic carditis in man could be produced in animals by establishing recurrent focal infection with group A streptococci, thereby inducing specific immunity but avoiding bacteræmia In fact, precisely this has now been done by Murphy and Homer Swift,[1] of New York, who have produced wide

1 Murphy G F Swift H F *J exp Med* 1949 89 687 *Ibid*, 1950, 91 485

spread bacterium free inflammation in the cardiac connective tissue of rabbits into which group A streptococci were repeatedly injected intradermally Photomicrographs of lesions from all parts of the hearts of these animals resemble almost uncannily the lesion in man This work will probably stimulate research into the precise streptococcal antigen to which the cardiac tissues of the rheumatic child are hypersensitive We may then hope that permanent desensitisation will prove practicable

TUBERCULOSIS THE SCOTTISH DRIVE

IN England and Wales the initial rise in the death-rate from pulmonary tuberculosis during the war was not maintained, though the incidence rose and remained high In Scotland, however, the death rate not only rose at the start of war but continued to rise fairly steadily, mounting from 52 per 100,000 population in 1938 to 66 per 100,000 in 1948 Signs of a fall appeared last year, when the Scottish rate dropped to 59 per 100,000, and the figures for the first half of this year suggest a further improvement But these rates remain high compared with the 1948 rate of 44 for England and Wales Moreover, the notifications, which have remained stationary or even declined slightly in England and Wales, have risen steadily in Scotland, from 4793 in 1938 to 8427 in 1949 Mr Hector McNeil, the Secretary of State for Scotland, is anxious that the Scottish regional hospital boards should do their utmost to improve the medical and nursing services, the hospital accommodation, and the clinic and domiciliary care offered to the tuberculous. In a memorandum [1] he reminds them that cases cannot be detected early unless hospitals, outpatients, clinics, and general practitioners work together, and that early treatment depends on the provision of enough hospital beds. He does not specify the number required, but it will be remembered that the joint subcommittee [2] of the Scottish Central Consultants and Specialists Committee and the Tuberculosis Society of Scotland which reported last July, suggested that 1350 additional beds are needed The regional boards are already planning to increase as far as staffing will allow the numbers of beds for the treatment of tuberculosis in sanatoria and hospitals for infectious diseases The Minister is also investigating the possibility of sending patients to the Swiss sanatoria as used to be done by local authorities before the National Health Service Act but he thinks that in addition some, at least, of the general hospitals, including the teaching hospitals, should establish tuberculosis units Both student nurses and medical students will thus get some very necessary experience of tuberculosis, though, as the memorandum points out, proper precautions must be taken to protect them against infection The General Nursing Council have agreed to consider any alterations, required by this change, in the student nurse's curriculum

Though this plan will present many difficulties, the Minister is convinced that it will be easier to staff general hospital beds than to establish tuberculosis facilities elsewhere Modern advances in treatment make it important for the chest physician to be closely associated with his colleagues in other specialties, moreover an increasing number of tuberculosis physicians are nowadays treating other diseases of the chest as well Both the patient and his doctor need the resources of a general hospital But the scheme does mean that special arrangements must be made for the disposal of sputum, ventilation, laundry, and X ray screening, and, since there is no extra money to spare, expenses must be covered by cutting down on other services—always a painful process Again, experienced chest physicians are scarce, and the regional boards will have to consider the establishment of training appointments for young men taking up this work In such posts they should be associated not only with the other specialists sharing in the treatment of tuberculosis (for instance, with thoracic, orthopædic, and urogenital surgeons) but with medical officers of health dealing with prevention and aftercare, and with the resettlement services of the Ministry of Labour

A good domiciliary service, supplementing hospital care, can reduce greatly the time patients spend in the wards and this must of course be associated with an effective clinic service The boards are asked to study the present distribution of clinics in their areas, decide where the chief ones should be, and arrange that they should work in association with the appropriate hospitals—not only tuberculosis hospitals but the main general and teaching hospitals Small country clinics should be associated with outlying hospitals The physicians responsible for the clinics should work in the hospital inpatient team and act as consultants in the domiciliary service

These constructive proposals bear out many of those recommended by the joint subcommittee already quoted The Minister intends to ask at intervals, about the progress of the work, and hopes that the boards will use these occasions to keep their tuberculosis services under regular review

1 Circular R.H B (S) (50) 27
2 Tuberculosis Service in Scotland. *Brit. med J* 1950 ii 61

THE PRACTITIONER S REMUNERATION

THE council of the Medical Practitioners' Union has been examining the profession's claim for better remuneration of general practitioners and its views are set out in a persuasively written newsletter [1] The council argues that the case (prepared by the General Medical Services Committee) for a percentage increase of remuneration, calling for another £6–7 million, would fail at arbitration, and it thinks that there would be far more chance of success for a claim limited to £5 million per annum for "removing anomalies and improving the conditions of those doctors at present underpaid." From the central fund, which, with the new £5 million, would amount to about £45 million but would vary with the number of doctors in the service, all practitioners would receive a portion of their remuneration as an 'expenses factor," varying from £600 to £800 a year with the size of the practice, a further sum of up to £200 as a 'length-of service" factor and uniform capitation fees at a rate round about 12*s* 6*d* per patient Mileage allowance, inducement payments, and the existing extra payments for additional services would be undisturbed

Obviously before we can divide extra money we have to conquer the Treasury's reluctance to believe that we have an unanswerable claim to receive it, we have to show that this extra money is needed to fulfil promises made to the practitioners, and to make their remuneration an adequate reward for their training, skill, and load of work and responsibility The G.M.S Committee's case is that at least a further £7 million is essential for remuneration on the scale promised in the Spens report, and it is so sure of the soundness of its case that it does not fear arbitration Incidentally, like the M.P U it believes that the central fund should be increased proportionately with increases in the number of practitioners in the service, and it has repeatedly pressed this view on the Ministry

In resting its case for the extra millions on the present anomalies in distribution, the union overlooks the fact that redistribution is within the power of the profession itself though so far no solution acceptable to doctors

1 *Medical World* Newsletter Nov 10 1950 Published by the Medical Practitioners Union, 55 Russell Square London W C 1

in all parts of the country has been found which does not involve the provision of new money In contrast with the M.P U 's proposals, the Conference of Local Medical Committees agreed that the supplementary millions should be used to increase the capitation fee on the first 1000 patients The sum of nearly £7 million which is being claimed would provide about £250 a year extra for each principal—perhaps a little more for some if fewer fixed annual payments were needed in some areas Admittedly this gives an all round increase not confined to the small list doctor But it is an agreed solution which all doctors are willing to accept, and it is the only plan yet agreed which will at the same time help the doctors in the small list areas and encourage the taking of assistants into partnership in the busier practices, so adjusting two of the most pressing anomalies

Would the M P U council still recommend their new system of remuneration if the Treasury refused to add to the central fund? Before the start of the service the profession rejected the idea of a universally applicable portion of remuneration unrelated to the number of patients Two years' experience may have induced different thoughts, but these two years have also created a situation in which such a reform cannot (in the absence of new money) be achieved without a much greater disturbance of earnings than would have been caused earlier

DAWSON OF PENN

OFFICIAL biographies are usually rather dull, and, because they tend to omit anything not altogether creditable, slightly misleading The new biography of Lord Dawson [1] is much more satisfactory There is a good deal of detail which is not really necessary about the changes in England and in medicine during the eighty years of his life, but many of the character sketches are intensely interesting To many readers the most astonishing thing about Lord Dawson himself will be the amount he achieved If he had shut himself up in his bedroom like Florence Nightingale and attended to nothing but public policy, the record would, perhaps, not have been so surprising, but it is impressive when one remembers that it was all done in addition to a busy private practice and hospital work, teaching, personal attendance on committees, and endless contacts with people

It is always worth considering what made a man great the differences between a great man and the average are, after all, smaller than is often supposed In Lord Dawson the driving force—and without driving force the greatest abilities can, and often do, come to nothing—seems to have been compounded of ambition and a strong religious sense of obligation to other people as individuals The origin of ambition is usually obscure Dawson's sense of obligation derived from the intensely religious, though unsectarian, atmosphere of the period of his development—it was the time of Huxley and the other Bible saturated and agnostic moralists The attention to the individual rather than to the abstract cause was part of the triumphant liberalism of the same historical epoch Another derivation of liberalism was his reiterated insistence on the principle, "never discourage the bad, always encourage the good"

Of the qualities by which Dawson achieved success the first was his conscious application of method He always said that he did one thing at a time, which means that he trained himself to give his whole attention to the matter in hand People who do not do this complain that they have a poor clinical memory, that they can remember faces but not names, and that they have to rely on notes Another feature of Dawson's method was his systematic use of holidays and the equally systematic way in which he distributed his holiday time

The second important quality was his "uncanny capacity for anticipating public or sectional reactions to any proposed measure," "his instinct for striking the right note at the right moment" Possibly related to this was the observation that "he predicted with some precision where shortages would be felt He would have been worth his weight in gold to a black market" It was this understanding of what was practicable and what was not which both made him so successful in his campaigns and led to the misconception that he was not a crusader In fact, as this biography shows, he embarked on many crusades, to some of which he kept recurring and some of which he never brought to a satisfactory conclusion He was always prepared, as in the case of health centres, to await the favourable moment

Another of his qualities was his skill in choosing men This was not a mysterious flair, but the result of careful investigation and thought it was related to his unusual helpfulness to patients in such matters as choosing the best resort for convalescence A useful instance of his capacity for team work and organisation described in this book is his investigations on jaundice in the 1914 war The detail given of this story is justified because detractors used wrongly to say that Dawson had stolen the work of younger men by virtue of his military rank

The last quality which was essential to Dawson's success was his capacity for hard work. This is almost indispensable for success, but as a rule it is the result of brute physical stamina This was not true of Dawson he was often physically below par His hard work was the result of determination combined with a methodical nursing of his own physical resources This nursing extended beyond orthodox methods to include such beliefs as the value of letting his spaniel lie on his feet in the car, on the grounds that "so long as the feet were kept warm one would not have headaches" Little foibles like this in the great physician were endearing

Mr Watson deals at length with the still rather too personal question of Lord Dawson's religion But it was well to stress the fact that he was deeply religious, as it is interesting that he tended, not to the agnostic stoicism of his era, but to definite membership of the Church of England, in the sense of the comprehensive church, rather than the exclusive one of creeds and articles

W H O, F A O AND NUTRITION

Two United Nations agencies, W H O and the Food and Agriculture Organisation (F.A O), both have nutrition sections, and a joint expert committee was set up to coördinate them This met for the first time in Geneva a year ago, and the report of its first meeting has now been published [1] In brief, it recommended the continuance of established policies—notably the coördination of technical knowledge by the organisation of regional nutritional conferences, the publication of technical memoranda, and the promotion of education, primarily by the award of travelling fellowships In these ventures F.A O will lay emphasis on nutrition in relation to the production, distribution, and consumption of food, in W H O emphasis will be on nutrition in relation to the maintenance of health and the prevention of disease In these fields both F.A O and W H O have already proved their ability, and we can look forward to hearing fresh accounts of good work

A new recommendation put forward by the committee was that W H O should itself undertake field research, and endemic goitre and kwashiorkor were considered suitable subjects for investigation This would be an important new departure The question whether U N O

1 Dawson of Penn. By FRANCIS WATSON London Chatto and Windus 1950 Pp 344 - 18s

1 Joint F A O/W H O Expert Committee on Nutrition Report on the First Session W H O Technical Report Series no 16 Geneva June 1950 Obtainable from H.M. Stationery Office Pp 24 1s 3d

is a suitable organisation for initiating and planning new research has already been debated at length[2] Such projects are bound to meet two difficulties The first would be to recruit first class investigators, at a time when almost all countries are short of scientists of the front rank, it would be hard to collect a good international team without seriously weakening national research services Secondly, an international research group would have to be very circumspect if it was to maintain harmonious relations with research workers and officials in the country in which it was operating True, this is no fundamental objection, but it is easy to visualise real difficulties arising in practice Certainly it would not be easy for F.A O and W H O, as discoverers of new knowledge, to repeat the successes which they have already achieved as coördinators of research and as educationists

RUSSIAN IMPRESSIONS

In the years before the war a good many British doctors visited Soviet Russia and found the experience exhilarating The general conclusion drawn from their reports was that in those days the Russians were mostly behind us in medical research and in the higher flights of diagnosis and treatment, but often ahead of us in arranging for the benefits of medicine to reach the people Immense needs, and corresponding scarcities, had obliged the planners of Soviet medicine to create what was primarily a utility service, but they hoped that, as prosperity increased, its quality would steadily rise Whether, despite war and preparations for war, the medical services have in fact improved, we do not know, for unhappily the Russian authorities have discontinued their policy of demonstrating their achievements to all comers Nevertheless it seems that the façade, at least, of Soviet medicine is still as impressive as ever, and it is most interesting to have the comments of a colleague who has just seen it for the first time Dr Nora Johns, who was Labour candidate for Kingston upon Thames at the last General Election, has just spent three weeks in Russia as one of a women's delegation invited by the Anti Fascist Women s Committee of Moscow As well as Moscow, she visited Kiev, Stalingrad, and the Crimea and on Nov 8, five days after her return, she reported her observations to a meeting of the Socialist Medical Association, who had nominated her as their delegate

In the cities, Dr Johns found, general medical services are provided through health centres, open night and day, serving 10 000–50 000 people, according to the density of the population In these centres the family doctor and the specialist work side by side, with equal pay and equal status the former is responsible for his 1200 odd patients at home and in hospital, and the specialist is called in as an adviser when required The centre provides a wide range of diagnostic facilities, as well as physiotherapy, and dental and eye services Attendance is based on an appointment system and the practitioners spent about 2 hours a day in the centre and about 4 hours visiting—at the rate of four visits an hour Tuberculosis and infectious diseases have their own services distinct from the health centres, and tuberculosis is discovered early (Dr Johns was told) by means of the biannual examination, including radiography, of every man, woman and child in the country She was informed that the tuberculous are admitted to a sanatorium, or to special wards in general hospitals, as soon as they are diagnosed

There is, it seems, no staffing problem in the Soviet Union (1) because for 3 years after qualifying, young doctors and nurses can be directed to any place where they are needed, (2) because the 6 hour shift system enables everybody to live out, and (3) because the number trained is based on the number needed Though the average doctor earns less than a shopkeeper ("it was a shock to learn the true status of doctors in society"), there is no shortage of entrants to the profession—perhaps because every doctor has the chance to become a research worker with a high salary and exalted status, such research usually being related to some immediate industrial or social problem The medical services of industry have top priority Each factory, large shop, or plant is responsible for all its own social and medical services, which include a crèche, a kindergarten, a rest home, and a community centre, as well as first aid stations and a complete health centre No child under 16 may enter industry, and overtime is forbidden for those under 18 and for pregnant and nursing women, the latter are allowed time off (with pay) to feed their babies, and so are mothers who have sick children at home or in hospital. There are no proprietary medicines, but the State is building up a pharmaceutical industry which is already exporting some of its products Antibiotics appear now to be plentiful, but Russians speak with appreciation of the drugs received from their Western allies during the war

In reply to questions, Dr Johns said that her medical hosts would not admit the existence of neurosis or delinquency among their people She was unable to present any all Russia statistics (mortality, morbidity doctor patient ratio &c) because they are not published, "for security reasons", and she had learnt nothing about the care of the chronic sick, and of congenitally deformed or defective children She had formed the impression that specialists and research workers were well versed in the latest British and American work, and she pointed out that the English language was taught in all Russian schools It was true that her visit had been in the nature of a conducted tour, but when she fell out of the party and wandered alone her observations only confirmed her previous impressions She had made a particular study of the people's diet, and she produced canteen menus and other data to support her contention that the Russian worker was better fed than his British counterpart All in all, the British delegation left with the conviction that the lives and feelings of the Soviet people were being completely misrepresented by British newspapers and speakers

CYSTS OF THE JAWS

The radiological diagnosis of cysts and cyst like tumours of the jaws is a highly specialised subject to which few radiologists have been prepared to pay much attention Though Worth and some others have established criteria which enable a correct diagnosis to be made in a high proportion of cases the reports returned in other than special departments are often of little value and sometimes surprising

Even those who have made some study of these cysts will find interest in Sonesson s analysis of some two hundred cases verified by pathological examination[1], for he provides a reliable guide to the radiological findings and his illustrations form a good reference collection Perhaps what is chiefly debatable about his work is the validity of the pathological criteria One may, for example question the extent to which the presence of a cyst lined with stratified squamous epithelium in continuity with an adamantinoma proves the origin of the latter from one of the simple odontogenic cysts And the classification and pathological identification of fibro osseous and myxomatous changes in the jaws is so difficult and so little agreed that a discussion of the radiological appearances of different named conditions must at present be somewhat unsatisfactory

2 The Question of Establishing United Nations Research Laboratories U N Dept of Social Affairs Lake Success 1949 Obtainable from H.M. Stationery Office Pp 290 10s

1 Odontogenic Cysts and Cystic Tumours of the Jaws By Anders Sonesson *Acta radiol* Suppl 81 Lund 1950 Sw Kr 20

Special Articles

PHYSICAL AND BIOLOGICAL EFFECTS OF ATOMIC EXPLOSIONS

FROM A CORRESPONDENT

THE most comprehensive and authoritative account of atomic bomb explosions so far released to the public has lately been published in a book, *The Effects of Atomic Weapons*,[1] compiled for the United States Atomic Energy Commission and Department of Defense by the staff of the Commission's Los Alamos Scientific Laboratory, University of California, and an impressive body of other American experts The book is intended to be "a source of scientific information for technical personnel," and it deals mostly with the physics of the explosion of "nominal" atomic bombs—i e, bombs similar to those dropped in Japan and tested at Bikini Much material that has hitherto been "secure" is included No information is given about the hydrogen bomb, but there are extensive though often theoretical calculations of various physical effects, based on the explosion of a bomb equivalent to 20,000 tons of T N T The discussions of physical phenomena include sections on their biological and medical implications, and there is a chapter on the protection of personnel The object of this article is to summarise the descriptions given of various types of atomic explosions and to interpret the biological data in terms of human suffering and medical defence

GENERAL DESCRIPTION OF ATOMIC EXPLOSIONS

Uranium^{235} and plutonium^{239} usually decay slowly, sometimes with the release of particles called neutrons When two masses of fissionable atoms such as these are suddenly brought close together, the neutrons being given off by one mass are augmented by those from the other If the two masses are of critical size, the neutrons reach such an intensity that a chain reaction starts, whereby the neutrons break down uranium or plutonium, with the release of more neutrons, further fission of uranium or plutonium, and so on This chain reaction releases large quantities of energy and leaves smaller atoms (fission products) behind The total mass of the fission products is less than the original mass of uranium or plutonium, the difference having been turned into energy

At the instant of fission a large number of neutrons and large amounts of gamma (electromagnetic) radiation are emitted The latter is called the prompt gamma radiation, because the fission products include radioactive isotopes, the bulk of which break down more slowly over the first minute, also liberating (delayed) gamma radiation as they do so

The energy released by atomic fission, as in atomic bombs, raises the temperature of the bomb casing and the fission products to over 1,000,000°C by 0 000001 sec after the start of the explosion This energy is dispersed in various ways, depending on the medium in which the bomb is exploded Thus the explosions in air, under water, or underground differ in their effects on human beings and material

Bomb Bursting in Air

The results of an air burst nominal atomic bomb can now be described more precisely and in greater detail.

When fission occurred in the air burst atomic bomb at Bikini, most of the prompt gamma radiation released is believed to have been absorbed by the bomb casing.

Immediately (0 000001 sec) after fission there was a small core of intensely hot material less than 30 ft in radius at the site of the explosion At this time the central mass was so hot (1,000,000°C) that it emitted electromagnetic radiations of extremely short wave length which hardly penetrated the air at all Thus the atmosphere prevented the loss of much energy by radiation from the explosion at this stage However, energy was probably lost in the following three ways

(1) The neutrons released by fission passed through the disintegrating bomb casing and through 2000 ft of air in a second, by which time and at which range almost all of them had been absorbed or had lost their energy

(2) The sudden rise of temperature at the bomb caused a rapid expansion of the surrounding atmosphere which was propagated through the elastic air as a shock "front" In the very early stages after the explosion the compression force of this shock front was sufficient to heat the atmosphere to incandescence After 0 0001 sec the air at the shock front had a temperature of about 300,000°C As the shock wave spread outwards its energy per unit area diminished and the temperature to which it heated the air therefore diminished, so after 0 01 sec the air, though still incandescent, had a temperature of some 2000°C

(3) Energy was probably lost in the form of gamma radiation given off by the disintegration of fission products

Meanwhile, behind the expanding incandescent shock front the fireball containing the fission products, which were still releasing gamma radiation, was expanding because of its heating effect on the atmosphere As it did so, the surface temperature of the fireball fell, so the radiations it emitted were of longer wave length which could penetrate the atmosphere more easily, thus the cooling continued more rapidly, not only because the fireball was expanding and so involving more atmospheric molecules but also because of heat losses by radiation The radius of the fireball was about 45 ft at 0 0001 sec, about 100 ft at 0 001 sec, and approached its maximum of 450 ft at 0 01 sec At this time its surface began to take over the role of thermal radiator, for the shock wave was no longer making the surrounding air incandescent The temperature of the radiating surface of the fireball is reputed to have risen to about 7500°C by 0 3 sec from the start of the explosion, after which it began to fall, reaching 5000°C at 1 0 sec

Thus a second after the explosion there was a central fireball about 450 ft in radius, cooling, and rising upwards because of its heat It had already released almost all its ultraviolet light and most of its thermal radiation (white light and infra red radiation), and the fission products had liberated half their total gamma radiation Furthermore, the explosion had propagated neutrons out to 600–700 yards, and by this time these particles could only have any further effects through radioactivity which they had induced Finally, by this time the blast front had reached about 800 yards, and was being followed by a suction wave

This suction wave was responsible for the next dramatic event The expansion of the atmosphere led to condensation of moisture—the "Wilson cloud chamber effect" This cloud seems to have been formed about 1 5 sec after the explosion at Bikini, and at a distance of about 800 yards By absorbing thermal radiation, the cloud would probably have protected persons beyond it from the small residual quantity of thermal radiation which the fireball subsequently emitted

After 10 sec the fireball had risen 1500 ft and had given off 80% of its total gamma radiation Thereafter its contents condensed, forming the famous mushroom

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cloud, which was slowly dispersed by wind The residual radioactive material in this cloud returned to the earth many miles away in rain—the so called "fall out"

Bomb Bursting Under Water

A bomb was detonated below the surface of the Bikini lagoon, which was 200 ft deep

In the very early stages after the underwater explosion at Bikini atomic fission must have formed a fireball of intensely hot material This started a shock wave through the water and forced water upwards as a dome of spray The fireball, which rose through the water, had become a bubble of superheated steam before it reached the surface When this bubble impinged on the atmosphere it initiated an air shock front which travelled outwards and formed a Wilson cloud round the explosion in much the same way as the shock wave from an air burst bomb Within this cloud, water was being thrown upwards by the detonation in the form of a hollow column, called the "plume," surmounted by the rising mushroom cloud of steam and fission products from the original ball of fire The plume probably reached a maximum height of 8000 ft and was about 2000 ft across Its walls were about 300 ft thick and were formed of water droplets After 10 sec the water droplets, containing highly radioactive material, began to fall back towards the lagoon, producing a mist, the "base surge," resembling the one at the foot of Niagara Falls This mist consisted at first of a blanket of fog about 100 ft high at the base of the plume It spread outwards from the plume and moved rapidly over the lagoon, reaching a distance of 8000 ft in about 3 minutes

For a while the mushroom cloud above continued to rise, but then it too fell back towards the lagoon A minute after the detonation the first particles fell into the base surge, and by $2^1/_2$ minutes almost all had fallen back into this fog bank Most of the material from the mushroom cloud was widely scattered by the explosion and fell into a ring with an inner radius of about 2000 ft and an outer radius of about 3000 ft

At 3 minutes after the explosion, therefore, the site was surrounded by a cloudy ring of radioactive water, some 1800 ft high, and with an outside radius of 8000 ft This base surge then began to rise, until at $4^1/_2$ minutes it was 1500 ft above sea level Shortly afterwards radioactive rain began to fall from it and continued to do so for an hour as the cloud moved down wind

This description suggests that, in the initial stages of the explosion, nearly all the energy of the bomb was imparted to the water Thus the neutrons and gamma radiation released at fission were captured by the sea water and formed radioactive substances in it The fission products were dissolved in the steam of the gas bubble The shock wave imparted to the water, and the gases in the bubble, were responsible for pressing up the dome of spray which became the mushroom cloud and also the hollow cylinder of radioactive material called the plume Later the plume and the mushroom cloud fell back towards the lagoon as droplets and formed the dangerous base surge, which spread out over a large area The fission products in the mushroom fell into the base surge, and the whole moved down wind as a cloud, from which radioactive rain fell for nearly an hour

The base surge might have different characteristics from those seen at Bikini in other weather conditions, and detonation at greater depths would alter the effects of the explosion

Bomb Bursting Underground

No observations on actual underground atomic bomb explosions are reported in the book The effects would depend on the soil characteristics and rock formations, but some general predictions can be made Soil and rock would be displaced by the sudden expansion of the fireball, and if the bomb was detonated 50 ft below the surface in ordinary soil, a crater 800 ft in diameter and 100 ft deep would be produced A severe shock wave would be imparted to the surrounding ground and almost all buildings would be destroyed up to 1000 yards from the explosion A good deal of radioactive dust containing dangerous radioactive isotopes would be liberated from the crater This dust would rise from the ground and be disseminated by wind and create a hazard wherever it fell. However, the crater would screen people on the surface from neutrons and much of the gamma and thermal radiations in the same way as the water did in the Bikini lagoon

Conclusions

It will be seen that atomic bombs will have widely different effects according to whether they are detonated in air, in water, or underground, and their effects will also depend on such environmental factors as the weather, the salinity of the water, and the nature of the soil and rocks The energy of the explosion is most rapidly dissipated when the bomb bursts in the air, whereas underwater and underground explosions release dangerous radioactive products which are scattered on water or dust particles and only slowly dispersed, mainly by the wind

DETAILS OF AIR BURST EXPLOSION

The effects of atomic bombs must be studied in greater detail if the medical hazards are to be grasped The book discusses the various effects separately, giving the ranges for each effect, its limits after 1 sec, the changes produced by the weather, and, finally and ominously, the probable increase in ranges with more efficient weapons

Blast Wave

The blast wave from an air burst atomic bomb moves outwards somewhat faster than sound At Bikini the blast front reached 800 yards in 1 sec, 1300 yards in 2 sec, and so on As the blast front moves outwards, the pressure it imparts to the air diminishes This is shown in fig 1, together with the probable effects of the blast front on buildings at the various ranges

From the point of view of human survival the blast wave has one favourable attribute—it takes time to

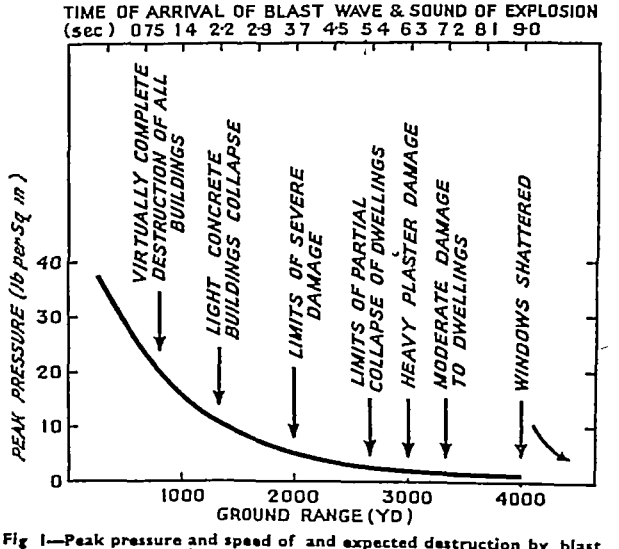

Fig 1—Peak pressure and speed of and expected destruction by blast wave of atomic bomb at various ranges.

Special Articles

PHYSICAL AND BIOLOGICAL EFFECTS OF ATOMIC EXPLOSIONS

FROM A CORRESPONDENT

THE most comprehensive and authoritative account of atomic bomb explosions so far released to the public has lately been published in a book, *The Effects of Atomic Weapons*,[1] compiled for the United States Atomic Energy Commission and Department of Defense by the staff of the Commission's Los Alamos Scientific Laboratory, University of California, and an impressive body of other American experts The book is intended to be "a source of scientific information for technical personnel," and it deals mostly with the physics of the explosion of "nominal" atomic bombs—i e, bombs similar to those dropped in Japan and tested at Bikini Much material that has hitherto been "secure" is included No information is given about the hydrogen bomb, but there are extensive though often theoretical calculations of various physical effects, based on the explosion of a bomb equivalent to 20,000 tons of T N T The discussions of physical phenomena include sections on their biological and medical implications, and there is a chapter on the protection of personnel The object of this article is to summarise the descriptions given of various types of atomic explosions and to interpret the biological data in terms of human suffering and medical defence

GENERAL DESCRIPTION OF ATOMIC EXPLOSIONS

Uranium^{235} and plutonium^{239} usually decay slowly, sometimes with the release of particles called neutrons When two masses of fissionable atoms such as these are suddenly brought close together, the neutrons being given off by one mass are augmented by those from the other If the two masses are of critical size, the neutrons reach such an intensity that a chain reaction starts, whereby the neutrons break down uranium or plutonium, with the release of more neutrons, further fission of uranium or plutonium, and so on This chain reaction releases large quantities of energy and leaves smaller atoms (fission products) behind The total mass of the fission products is less than the original mass of uranium or plutonium, the difference having been turned into energy

At the instant of fission a large number of neutrons and large amounts of gamma (electromagnetic) radiation are emitted The latter is called the prompt gamma radiation, because the fission products include radioactive isotopes, the bulk of which break down more slowly over the first minute, also liberating (delayed) gamma radiation as they do so

The energy released by atomic fission, as in atomic bombs, raises the temperature of the bomb casing and the fission products to over 1,000,000°C by 0 000001 sec after the start of the explosion This energy is dispersed in various ways, depending on the medium in which the bomb is exploded Thus the explosions in air, under water, or underground differ in their effects on human beings and material

Bomb Bursting in Air

The results of an air burst nominal atomic bomb can now be described more precisely and in greater detail.

When fission occurred in the air burst atomic bomb at Bikini, most of the prompt gamma radiation released is believed to have been absorbed by the bomb casing

Immediately (0 000001 sec) after fission there was a small core of intensely hot material less than 30 ft in radius at the site of the explosion At this time the central mass was so hot (1,000,000°C) that it emitted electromagnetic radiations of extremely short wave length which hardly penetrated the air at all Thus the atmosphere prevented the loss of much energy by radiation from the explosion at this stage However, energy was probably lost in the following three ways

(1) The neutrons released by fission passed through the disintegrating bomb casing and through 2000 ft of air in a second, by which time and at which range almost all of them had been absorbed or had lost their energy

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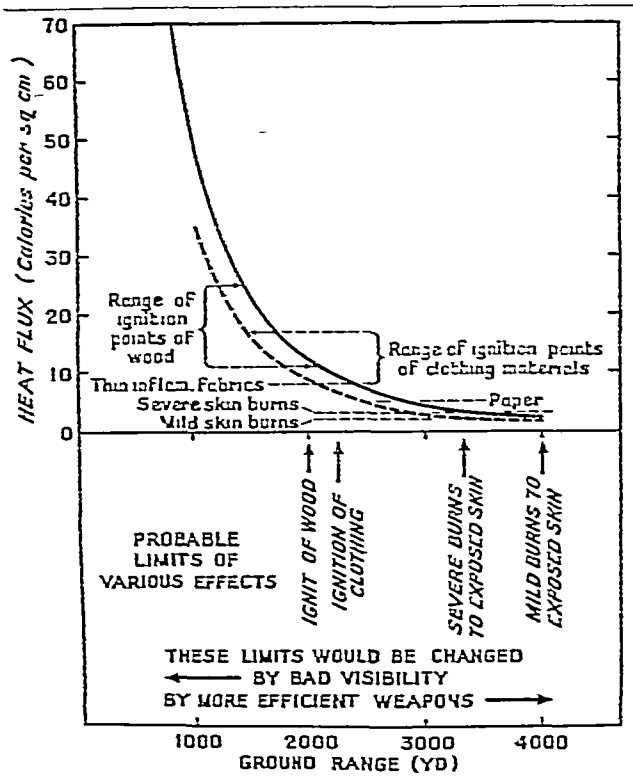

Fig. 3—Total heat flux at various ranges from air-burst atomic bomb. Interrupted line shows doses received in one second

descence by the blast wave in the very early stages, and later from the fireball

About 70% of the total thermal radiation is emitted in the first second (interrupted line in fig 3) When these radiations are absorbed by inanimate or living matter their energy is dissipated as heat Since the total doses received at various ranges may not convey much to the average reader the effects which these doses would have on various types of material are also indicated in fig 3

The propagation of thermal radiation depends on its attenuation by the atmosphere, hence, as the visibility diminishes, less thermal energy passes through the air This is important because it will be seen from fig 3 that thermal injury to the skin has a very long range On a foggy day the range of thermal injury may be reduced by as much as 1500 yards The long ranges of thermal action in clear weather are presumably of more concern in America than in Great Britain

The effects on various types of material shown in fig 3 are based on results obtained at the Brooklyn Navy Yard. The ranges cited fit fairly well with the actual observations in the Japanese attacks, but it is not clear how the laboratory experiments in Brooklyn were conducted and whether the spectrum of the laboratory radiation was the same as that of an atomic bomb, which is fairly difficult to simulate

Protection from thermal radiation is afforded by non-inflammable structures (air-raid shelters or houses) and by non-inflammable thick clothes The ignition ranges for heavy paper and light-weight fabrics given in fig 3 support the view that they are *not* good protection despite the contrary opinions sometimes quoted.[2]

2. The Home Office Manual, in its chapter on Heat Flash (p. 19) says "even clothing though it may itself become ignited, affords some degree of protection for the skin underneath, particularly if not in close contact with the body and especially if of a light rather than a dark colour This colour differentiation only applies, however at distances where the heat intensity has fallen below that which would fire the fabric as a whole." Atomic Warfare Manual of Basic Training Home Office Pamphlet no 6. London, 1950 vol. II p 19

Whatever errors may have arisen in the laboratory observations referred to above, there is no doubt that in Japan clothes caught fire as far as 1600 yards from the explosion, and that skin was burnt at 4000 yards Since clothes caught fire beyond the range of fatal gamma radiation, it is certain that paper would have done so The Japanese were burnt by contact with their clothing heated by the bomb flash at ranges up to 2000 yards, and they would have been burnt through paper at greater ranges

The ranges of thermal injury would be extended by 500–1000 yards if the energy of the bomb were doubled. This would offset the protective action of our damp climate in Britain

The Fall Out

About half the radioactivity in the mushroom cloud is believed to fall back to the ground in the first twenty hours after the explosion The prevailing winds would scatter these particles widely and radiation from this source would probably not be a serious hazard unless heavy rain fell soon after the explosion when the radioactive particles might be washed down in dangerous concentrations.

The remaining half of the radioactivity in the mushroom cloud is contained in particles so small that they remain a very long time in the air If a vast number of bombs were exploded these particles might possibly endanger all forms of life on the earth, but for this to happen something like 755,000 bombs would have to be exploded simultaneously

Summary

An air-burst atomic bomb of the type dropped in Japan will completely devastate a central zone about 1000 yards in radius, and people in this zone will have little chance of survival. In an intermediate zone buildings will suffer moderate devastation and in an outer zone they will be less severely damaged. In both these zones burns will occur in people exposed to thermal irradiation

MEDICAL IMPLICATIONS OF THE DATA ON AIR-BURST BOMBS

The American writers discuss very fully the effects of gamma radiation but they say little about other injuries. An attempt has therefore been made to obtain a more general view of the likely effects on human beings and to determine the value of defensive measures in reducing the number of casualties

What would be the effects of an atomic bomb exploded in the air over a British city without warning as might happen in a sneak raid or if the bomb could be propelled by rockets? The results would be similar to but by no means identical with those seen in the bombing of Japan It is possible to estimate roughly what types of injury would be caused at various distances from the explosion and the number of different sorts of casualties which might be expected.

Flash-burns

Apart from the central zone, 1000 yards in radius, where most people would be killed flash burns of the exposed skin could occur over about 16 sq miles. Towards the periphery of this area the heat would only be sufficient to cause shallow second-degree burns Within about 3500 yards of the explosion third degree burns would occur where the radiation fell fully (normal incidence), whereas radiation falling at a glancing angle would cause shallower burns

In Japan there was nothing mysterious about the flash burns reported. The radiant heat (*not* gamma radiation) falling on the skin heated it very rapidly, and this heating together with any photochemical effects from ultraviolet radiation, probably injured the superficial

spread Hence some evasive action could be taken by people outside the central zone, which is rapidly and completely devastated However, a blast wave may cause injury or burial from falling masonry and laceration from flying glass at very great ranges, and in the central zone it may start fires as a result of the collapse of buildings

Protection may be achieved by strengthening buildings and windows and by building blast screens

The range of blast effects would be much greater if atomic bombs became more efficient Doubling their T N T equivalent might extend the range by 500–1000 yards

Neutrons

Neutrons are particles of energy carrying no electrical charge They are absorbed by light materials, but tend to pass through heavy ones This anomaly is explained as follows When a neutron hits a light atomic nucleus its energy is shared between the two, so the neutron loses energy On the other hand, when a neutron hits a heavy atom it " bounces off " without losing energy

Neutrons injure by inducing radioactivity and by removing electrons in their path, so causing ionisation and chemical disruption in biological systems

As neutrons pass through the relatively light molecules of the air they lose energy, there were about ten times as many slow low energy neutrons (1 M eV) as fast high-energy neutrons (3 M eV) at large distances from the air burst bomb at Bikini Unfortunately, slow neutrons are a more serious biological hazard than fast ones because they are more likely to be trapped in the body

By 1 sec after the explosion of an air burst bomb all its neutrons would be dispersed, so there would be little opportunity for evasive action Protection from neutrons is very difficult Reducing their energy by interposing concrete may convert fast neutrons into slow neutrons and so make them more lethal Concrete containing iron oxide ore would provide better protection It must be remembered that the neutrons reaching any particular point will be moving (bouncing) in every direction, so if a shelter is to be effective it must be completely enveloping

The range of lethality from direct exposure to the neutrons is estimated at about 600–800 yards Doubling the bomb's T N T equivalent would extend this range by some 100 yards

Gamma Radiation

Gamma radiation is an electromagnetic radiation of shorter wave length than light and ultraviolet radiation It is propagated at the speed of light It was emitted by the fission products of the air burst bomb at Bikini, mainly during the first minute after the explosion, 50% being released in the first second The total doses which reached the ground at different ranges are shown in fig 2, in which the interrupted line marks the dose reaching the ground by the end of the first second, and therefore indicates the possibility of evasive action

Gamma radiation injures biological systems by disruptive electrons and so inducing ionisation and chemical dislocation

The probable doses of gamma radiation from an atomic bomb for fatality and illness are shown in fig 2 to indicate the ranges at which death and radiation sickness may be expected in people directly exposed to the bomb The results cited are based on direct experimental measurements of the total dose, but we are not told what are the respective energies (voltages) of the gamma radiation emitted This is important because the ionising effects of these radiations when they impinge on living organisms depend on the energy (penetration) of the radiations

Protection from gamma radiation is afforded by heavy materials Thus 24 in of concrete would protect human beings fairly well to within 1000 yards from the bomb (dose reduced to 100 r), but 36 in would be needed to prevent radiation sickness completely at this range (dose reduced to 25 r) Some contend that even 25 r may have severe genetic effects, and if this is true the long term consequences of atomic warfare may be even more serious than its immediate effects

The transmission of gamma radiation through the atmosphere is unlikely to be much altered by weather conditions It is reassuring to find that its range would not be greatly increased if atomic bombs were more efficient Doubling the energy of the bomb would increase the lethal range by about 100 yards

Ultraviolet Radiation

Ultraviolet radiation (U V R) is electromagnetic radiation with a wave length longer than gamma radiation but shorter than visible light

The question has arisen whether this radiation would be an important cause of injury In the earliest phases of an atomic bomb explosion a good deal of U V R is undoubtedly emitted, but these phases last less than 0 01 sec, and U V R is heavily absorbed by the atmosphere On the other hand, owing to its photochemical action on the skin, U V R can produce burns at very low dosages The American writers find by calculation that U V R from an air burst bomb would not be a serious biological hazard No experimental measurements are given to support these calculations, but it seems probable that the effects of U V R would be swamped by those of thermal radiations which have a much greater range and power of penetrating human skin

Visible and Infra red (Thermal) Radiations

The electromagnetic radiations in the visible and infra red parts of the spectrum are usually referred to together as the thermal radiation from the air burst atomic bomb They are emitted from the air heated to mean

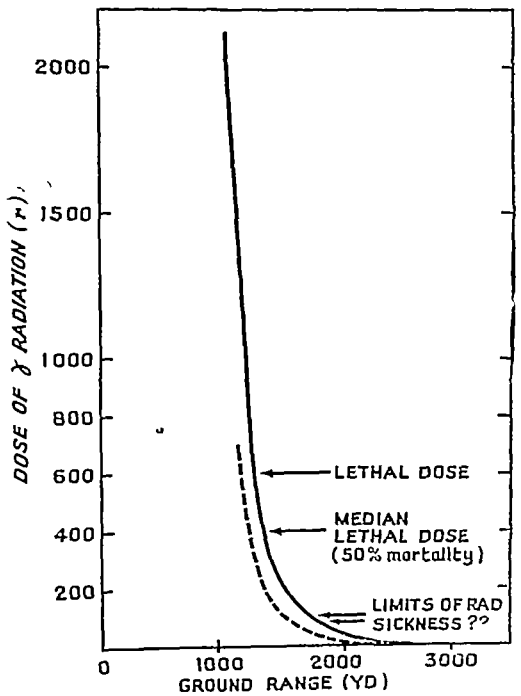

Fig 2—Total doses of gamma radiation at various ranges from air-burst atomic bomb Interrupted line shows doses received in one second

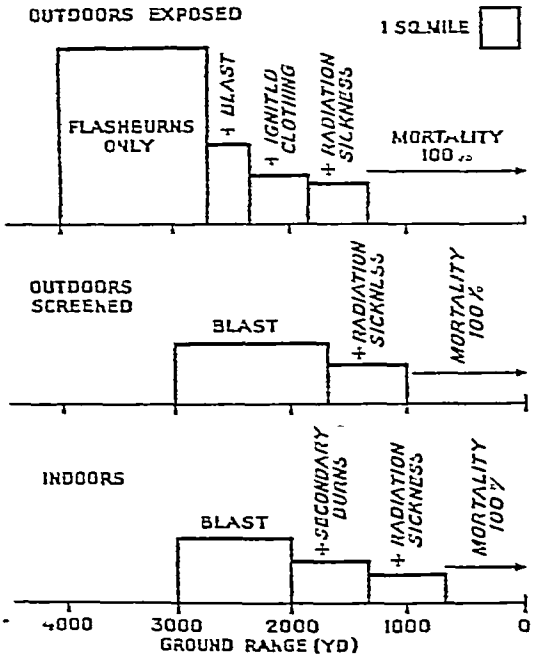

Fig 4—Surviving casualties from air-burst atomic bomb attack on unwarned community Area of each block approximately equals area from which casualties would arise and therefore shows rough proportions of various types of casualty A, injuries to persons out of doors directly exposed to explosion B injuries to persons out of doors but screened by buildings from explosion C, injuries to persons indoors.

British city Thus injuries from gamma radiation are important from the medical point of view for several reasons.

First, it must be clearly grasped that the total number of gamma-radiation casualties would be too large to be ignored, there would probably be several thousands in an attack against an unwarned community However, the onset of radiation illness is more and more delayed as the severity diminishes, hence there would be spacing of cases in time—an advantage to hard-pressed medical services.

Unfortunately, gamma-radiation illness is an unknown clinical entity in this country, which places both physician and patient at considerable disadvantages. A good deal has been written about radiation sickness in Japan[3] A summary of the clinical symptoms of radiation sickness, and a description of its pathology, are given in the book. The authors explain that high doses of gamma radiation (600 r or more) were lethal in Japan The victims vomited after an hour or two, and then had a few days free from symptoms. Before the end of the first week, however their white-cell counts had fallen to below 2000 per c.mm, and they began to get diarrhœa, vomiting, inflammation of the mouth and throat fever, and rapid emaciation, leading to death in the second week or earlier from a disease characterised by overwhelming infection and toxæmia

Victims who received the median lethal dose of 400 r were nauseated and vomited after one or two hours. They then had no definite symptoms for about two weeks. Thereafter they showed epilation, loss of appetite, fever, severe throat infections, anæmia petechiæ, and rapid emaciation during the next two weeks Half the patients receiving this dose of radiation died and the others had a protracted convalescence, with gradual recovery from their blood dyscrasias and infections.

Victims who received much lower doses 100–400 r had a long latent period without symptoms lasting about three weeks. Their course was then similar to, but less heavy than that of those receiving 400 r, and their mortality-rate was much lower

There is as yet no evidence of a specific therapy for radiation illness, and little likelihood of such an advance in the near future Further, when the patients become sick diagnosis and observation of the course of the disease demands a good deal of laboratory work, especially blood-counts Supportive treatment (blood-transfusions for anæmia and leucopenia, antibiotics for infections) is required in very large quantities and is consequently very expensive. There is also the very important point that the physician may have to decide to turn his back on people who have received high doses, leaving them as helpless cases although they may not appear very ill at the time On the other hand, he may be confronted with a large number of people who may believe they have radiation sickness but have not Finally, it is very likely that the course of radiation sickness would be aggravated by other injuries

It will be seen that at very short ranges (less than 600 yards), most persons would probably be killed outright by the blast wave, by neutrons, which also produce radiation sickness, by gamma radiation, by heat, or, if indoors, by collapse of buildings

The numbers of patients that survive the explosion, and the types of casualties seen, are shown in fig 4

PROTECTIVE MEASURES AGAINST AIR-BURST BOMB

In an attack against an unwarned British city, then the casualties would number tens of thousands, and among the survivors there would be very many thousand burns, many thousand wounds, and probably several thousand cases of radiation sickness Since there might well be many atomic bomb attacks, the prospects of a future war are appalling Action can be taken to reduce the human suffering from each attack, but it must not be forgotten that future attacks would probably be made with more powerful weapons than those seen in Japan The defensive measures will now be discussed in order of their probable sparing action

(1) *Warning and Shelters*

If warning of air-raids could be given, and the population outdoors could take cover in suitable shelters casualties would be mainly restricted to the zone of blast, a radius of up to 3000 yards in other words, it is likely that the area from which survivors would emerge could be divided by at least 2 and by up to 16 in the most favourable circumstances, if all were protected But an atomic bomb attack might be made during an air raid with the result that civilian defence workers on duty in the open would be injured even in the outer zones. There would thus be a serious risk of losing vital personnel Some protective action could be taken to shield all these people, as described below

(2) *Individual Evasion and Protection*

The provision of protective clothing against gamma radiation seems impossible it would have to be as heavy as thick concrete Against this may be set the relatively slow emission of gamma radiation after the first second and therefore the possibility of evasion A crouching posture facing away from the flash is suggested by the American writers, for this might reduce the total angle subtended at the source of the bomb However they do not say whether gamma radiation is largely reflected by the earth and buildings If it is, this might invalidate the evasion of gamma radiation by this posture

Some protection against blast might be given by thick clothing to prevent penetration by glass. Further

3. Hersey J Hiroshima. London.

1–3 mm of skin, for these figures correspond well with the penetrating properties of white light and infra red radiations, and our knowledge of heat conduction in the skin suggests that this heating would be very intense near the surface but not great at depths beyond 3 mm

At short ranges the skin surface of the Japanese casualties was charred and third degree burns resulted At long ranges the original heating seems to have released toxic vasodilator substances which permeated down to the capillaries and produced vasodilation after a short time, followed (sometimes several hours later) by the formation of blisters

A bomb exploding over an unwarned city would produce flash burns running into tens of thousands In Japan the total was about 30,000, and because their number was so vast the infection rate among these casualties was almost 100%, and infection was probably responsible for the keloid scarring seen in these burns It follows that, except where flash-burns are so extensive as to demand treatment for shock—i e, involving more than 15% of the body surface—the main aims of treatment must be to prevent infection and dress the burns in such a way that the victim can fend for himself until skin grafting is necessary, which in the case of deep burns will not be for a month or so

Since 70% of the total radiation will reach the victims in the first second, evasive action after the first flash could not greatly reduce ranges of effect of an air burst bomb, the range for third degree burns might perhaps be reduced to 3000 yards

Flash burning mainly affects the exposed skin This means that, in Britain, flash burns of the hands and face, and of the legs also in women and children, would be very numerous unless suitable precautions were taken Burns of the legs are particularly serious because they immobilise the casualty, and burns of the hands because of their economic consequences Thin fabrics and paper cannot be regarded as good protection against flash-burning For at least 3 sq miles around the central zone contact flash burns would occur through clothing heated by the flash and these would make greater demands on the medical organisation, because they may involve any part of the body Then clothing may be ignited by the flash Many modern light weight fabrics are highly inflammable, and these would carry a terrible risk in an atomic bomb attack They would be rapidly ignited as far as 2300 yards from the explosion and would produce very serious and deep burns to large areas of the body

Since many patients with contact flash burns and flash burns from clothing ignited by the flash would need immediate admission to hospital and treatment for shock, these types of casualties would be a serious and heavy immediate medical burden

Other Burns

Besides the flash burns there will be other burns among people surviving immediate death but burned during their escape from fires started in the central zone These casualties, known as secondary burns, would be of all depths and various extents Their total number is open to considerable speculation, there were undoubtedly many thousands of such cases in Japan In a British population wearing its usual clothing, the face and hands would be most liable to secondary burns, the legs also being highly vulnerable in women wearing skirts In planning protective measures, the similar distribution of flash and secondary burns simplifies the planners' task (see below)

Injuries from Blast

Blast from an air burst atomic bomb could shatter windows many miles from the explosion However, it is unlikely that all human beings would be injured up to the extreme ranges, because they would have a few seconds' warning of the impending disaster from the flash in the sky It is therefore impossible to define the exact limits of lacerations, contusions, or fractures. Further, if the attack were against an unwarned community, it is conceivable that a person at long range might receive a mild flash burn and then try to take cover, only to be injured by glass or falling masonry, unless he were aware that the blast wave was approaching Most probably, if a city were attacked without warning —probably without any declaration of war—the populace would instinctively take cover from flying glass If there was a war on, evasive action might be taken almost instinctively by those outside the central zone Though such action might not be successful in every case, it suggests that the "effective" area for injuries from blast would be roughly that at which plaster would fall—i e, out to 3000 yards, or an area of 8 sq miles outside the central zone of devastation

Strong buildings would protect their inmates in the central zone Some people in buildings survived direct blast, neutrons, heat, and gamma radiation in the central zone in Japan, and the same would be true for some people in a British city However, many of these would be injured by glass and falling masonry and, if rescued, would form a serious medical burden of traumatic and orthopædic cases These would be similar to the secondary burns referred to above, in that they represent the casualties who "emerge from the depths" of the central zone of devastation, where the risks of serious injury are highest

Blast casualties would therefore come back for medical attention from a large fringe area and from the basements and lower storeys of buildings in the central zone In an air-burst bomb attack against an unwarned community they would number many thousands They would be "cut, bruised, crushed, and fractured," probably in that order of frequency They would be similar to the air raid casualties of the 1939–45 war, but in far greater numbers, and their treatment would require the same skill, cost, and man power, if it were forthcoming

Gamma Radiation

When the first atomic attacks were made against Japan, gamma radiation became, in the public mind, the main terror of the atomic bomb More recently it has been relegated and seems to be appreciated now as a minor effect This is mainly because it has been stated that if one were in the central zone one would be "dead anyway," whereas if one were outside a radius of 1800 yards one would not suffer very serious injury from gamma radiation On the other hand, flash burns have a much longer range Therefore gamma radiation would not produce so great a number of casualties as would thermal radiation in an attack against an unwarned community There is now a growing tendency to discount gamma radiation casualties altogether and instead to concentrate on burns It will be shown, in considering attacks against a warned and indoctrinated city, that the number of burns could be reduced, so that gamma radiation could become a relatively frequent cause of injury It is also important to remember that some people in the central zone might be spared immediate death but have inadequate screening to prevent gamma radiation illness Once again, therefore, some people would emerge from the depths of the central zone with severe illness This point is laboured here because there is a growing tendency to consider the central zone as being so completely devastated that everyone there would be killed outright Even in the attacks made on the unwarned Japanese communities this was not true, and it would certainly not be true in an unwarned

Reconstruction

THE QUALITY OF MEDICAL CARE

An American Report

FROM A CORRESPONDENT

THERE are two ways of starting a national health service The first is to set an appointed day and drive on regardless of difficulties The second is to examine the subject from every conceivable angle and try to define the detailed pattern in advance Both have their drawbacks The first method may mean improvisation, and retaining practices of doubtful value Costs may prove to be unexpectedly high, and some group or other is bound to be dissatisfied Above all, extensive remodelling of the scheme in the light of experience is almost impossible With the second method much time may be wasted in theoretical discussion, and, at the worst, the service never gets launched at all, but, given good will, the difference between the first project and the final one may be as great as the difference between a racing yacht and a converted trawler The ideal would, of course, be to combine the best of both methods and, from carefully prepared blue prints, to undertake limited trials with full operation to come later in orderly sequence

The Americans are entering the blue print stage, and a stream of reports by experts is appearing One of these, produced for the American Public Health Association by a committee headed by Dr Dean A Clark, is of unusual interest [1]

ESSENTIALS

It begins by saying that a national health programme must assure full freedom of experiment and change in both the science and organisation of health services It recognises that most measures for the promotion of health are social or educational, and that medical care must be planned with the whole picture in mind

The standards laid down for medical care are quantitative and qualitative The former are those with which we are already familiar but include also the education of the public as to the best use of the services The requirements as to quality are

1 Able well trained, and efficiently functioning personnel
2 Facilities and equipment which meet high technical standards
3 Health services which encompass the best knowledge of modern medical science, and which ensure availability and continuity of care
4 Adequate financial arrangements, making possible the timely provision of all indicated services without economic deterrents for patients or practitioners
5 Sound administrative organisation and operation designed to promote efficiency and economy of service

The first component of good quality to be discussed is the selection and education of doctors, and emphasis is laid on the need for pre professional education in the humanities and social sciences The need to keep the medical curriculum constantly under review is emphasised, and the comment is made that no medical student should be graduated without study of the psychological, social, economic, occupational, and other aspects of "total" patient care This is to be achieved by active participation of the medical school in organised community programmes of health and medical care and by ensuring that all graduates are experienced in outpatient service, home care social service, public health practice, rehabilitation, and work in rural and small community hospitals Postgraduate education should, it is said, include visits by consultants and teachers travelling out from the teaching centre to local meetings, clinics, and ward rounds The unusual suggestion is made that qualifications of licensed practitioners might be reviewed periodically so as to safeguard the quality of care provided

GENERAL PRACTICE

Practitioners here in England will agree that the greatest single deterrent to good service is the isolation of the individual practitioner from his colleagues, and that doctors should be free from the burden of non professional chores, with enough time and incentive to read, attend lectures, and otherwise improve their knowledge and skill. Another point of particular importance in the light of the controversy centring round the Collings report is that the general practitioner, if given complete consultant reports, "can usually continue with the management of all but the most specialised therapeutic procedures" Efforts to enhance the prestige of the general practitioner in the United States have included the establishment of general practice sections in hospitals and medical societies A "specialty board" in general practice is under discussion The report tilts at the inefficiencies of unsupervised medical "shopping"

Stress is laid on group practice as the mainstay of quality, but the authors of this report mean far more by this term than we do They are thinking of a community health and medical centre supplying the fully coordinated and balanced health service needed by a local population This involves not only joint housing of hospitals and health departments but the establishment of offices for private practitioners and medical groups within the hospital In 1948 the A.P H.A and the American Hospital Association issued a joint statement emphasising the advantages of hospitals and health departments working together This need to integrate preventive and clinical medicine by the use of buildings in common, by making hospital and health areas coterminous, and by functional links with group and rural practitioners, pervades the whole of the present report Thus the definition of "prevention" is extended to include the prevention of continuance or progress of a disease which has already begun "In other words, effective preventive services requires prompt, comprehensive, and continued personal care as well as community service of the kind traditionally associated with public health activity"

ADMINISTRATION

On economic and administrative control the report is uncertain and sometimes almost contradictory This is implicit in any report which sets out to describe the ideal and has at the same time to admit that some limitations will be necessary, at least initially, until the medical and administrative resources of the nation are better developed and organised The administrative safeguards of procedure manuals (even if liberally interpreted and frequently reviewed), statistical audits, and prior administrative authorisation for selected services have an ominous ring On the other hand, everyone will agree that rates of payment should be flexible, adequate, and proportionately related to skill experience, and responsibility, and that they should be determined in advance by competent experts in the particular field Capitation or salary payment is preferred to fee for service—provided group medical practice is adopted "In a group, the compensation of each physician depends not only upon his own efforts, but also upon the success of the group as a whole, and the judgment of his fellows regarding his contribution to the group's success The reputation of the entire group is at stake in the satisfaction of patients with the services of all physicians in the group"

On the subject of hospital administration the authors are on sure ground when they say that those in charge

1 The Quality of Medical Care in a National Health Program a statement by the Subcommittee on Medical Care American Public Health Association Reprinted from *Amer J publ Hlth* 1949 39 898

people outside the central zone would have two or more seconds' warning of the approach of the blast wave (it should be borne in mind that they have not yet heard the noise of the explosion but would only have seen the flash) They might well be able to adopt a suitable posture if out in the open, or gain some sort of cover from glass and falling masonry in doorways if they were in a city street

Once the bomb has exploded, the chances of greatly reducing the dose of radiant heat are low Extremely swift action would be needed to avoid flash burns Protection against the radiant heat would mainly consist in also covering the exposed parts of the body The hands and faces in men, and the legs also in women and children, could be protected by gloves, wide brimmed hats, and trousers for the female and child population This simple "protective" clothing, especially for the hands and face, would also reduce the number of secondary burns, for in escaping from a house or street fire exposed skin would be subject to a greater risk of burning than skin covered with thick non inflammable clothing In this way the number of minor burns could be greatly reduced As regards the serious burns from inflammable clothing, common sense dictates that the wearing of such fabrics in war, when incendiary or atomic attacks might be made, would be the utmost folly The population should be warned strongly of the extra risk of flimsy combustible materials By not wearing such fabrics the number of major burns could be reduced The ideal protective uniform for those whose duties exposed them to a high risk of burning would be non inflammable, and of high reflectivity through being light in colour or having a metallised surface, and would be a very poor conductor of heat It should cover as much of the body as possible

These measures might well reduce the casualties of various types to a quarter, or less, of those seen in Japan If atomic bombs become more powerful, such preventive measures will be even more necessary

Planned Care for Casualties

Despite all actions, warnings, shelters, evasion, and protective garments, and even the common sense measures described above against burns, it is impossible to release the energies of an atomic weapon over a city and not inflict thousands of casualties The fundamental problem of medical treatment would be to prevent economic loss from long convalescence from unhealed burns, septic lacerations, ununited fractures, and gamma radiation The task would be unique in two important aspects the large number of civilian casualties and the suddenness thereof At every turn the planner of medical defence against an atomic weapon finds himself confronted with the sudden appearance of very large numbers of very many sorts of casualties Unless the doctors knew what types of injury to expect, and unless there were some sort of scheme behind the medical activities after an explosion, chaos of the scale seen in Japan would certainly ensue

UNDERWATER AND UNDERGROUND ATOMIC EXPLOSIONS

It is much more difficult to predict the results of underwater and underground atomic explosions than of those in the air From the medical point of view such explosions would produce immediate casualties from blast, and delayed casualties from radiation illness

Underground Explosion

In the case of a shallow (50 ft) underground atomic explosion the areas affected by blast would be between a quarter and half the size of the areas for corresponding damage by blast from an air burst atomic bomb Thus the blast casualties would be far fewer Further, there would be fewer flash burns However, gamma radiation sickness might be more widespread ; for, although the immediate radiations emitted from the bomb would be blocked by the ground, there would be a large amount of radioactive dust which would fall near the crater No estimates are given for its limits of dissemination This radioactive dust would be a biological hazard where it fell, for the radiations emitted during radioactive decay might not only fall as external radiation directly on to people but also enter the body by inhalation or by ingestion in contaminated water and so produce internal radiation Internal radiation casualties would be comparable to radium poisoning These serious risks could be greatly reduced by competent monitoring for dangerous radiations, and by suitable washing and chemical decontamination, all of which processes are primarily civilian defence responsibilities The American book gives a good deal of information about apparatus and methods for these procedures

Underwater Explosion

Rather more information is given in the book about underwater explosions, based on the Bikini underwater test From the medical point of view blast casualties would come from areas just over a quarter of the size of those for comparable damage from an air burst bomb With a wind blowing at 5 m p h , radioactive water droplets could be a lethal hazard to exposed human beings over an area of 4 or 5 sq miles However, as with underground explosions, there would be no flash burns, far fewer (roughly a quarter) secondary burns, and far fewer blast casualties (again roughly a quarter), compared with an air burst atomic bomb

Because of the difficulties of prediction with these two types of atomic weapons, and the vagaries of the British climate, it seems prudent to postpone any attempt to assess the medical problems involved until we have more information Some evasion might be achieved by taking shelter in the interval of several minutes between the explosion and the settling of the dust or water droplets, and by wearing respirators and by suitable monitoring thereafter However, decontamination and the subsequent rescue of those sheltering would certainly be a very difficult operation, requiring heavily protected vehicles (? tanks) and excellent civilian morale and discipline

CONCLUSIONS

A great deal can and is being done to shield the population from injury in this terrible form of warfare But even so, there would be many casualties, especially if there were multiple attacks with more efficient bombs The first aid posts would be overrun at first with ambulant minor casualties from the fringe of the attack, and these people might well interfere with the handling of more serious cases arriving later Amid all this turmoil there would be serious problems of morale and other difficulties, including feeding and housing refugees, working without main services, and tracing missing persons, down to the keeping of proper medical records and so on

It is usual to end articles on this subject in an optimistic vein, calling for organisation to meet the peril and for general preparedness No attempt has been made here to assess the medical burden of atomic warfare in terms of hospital beds, miles of bandages, bottles of plasma, and the number of doctors required Those interested in such statistics can make their own computations from the data given Those who do so will find it difficult to remain optimistic when their calculations are finished

For the next three weeks I went back to the lab once a week, my wife going with me, but though we took the bus, I gradually found myself feeling weaker, and my pallor was returning Nor could I manage to do anything at home; I usually had my breakfast in bed and managed to get up for my dinner, but then I only sat about in the garden or indoors I noticed that the lack of blood even seemed to affect my brain, I was slower to grasp anything, and I could not concentrate enough to read We occasionally enjoyed a game of cards with our friends, but even at this I used to feel myself getting easily excited, whereas before my illness nothing ever ruffled me By the end of the third week at home I was feeling pretty low again, and the doctors asked me to go back into hospital on the following Monday I had a bad day on the Sunday—in fact I was so weak I almost fainted over my dinner, and had to get to the window for air I felt stifled as though I could not breathe, and could hardly drag myself upstairs I had to do the trip down to the city on the Monday in a taxi

I had a transfusion of three pints of concentrated cells on the Tuesday and again on the Thursday, by which time I looked like a farmer's boy (so my visitors told me) and felt uncomfortably full I was allowed home again after a week, and the doctor decided to keep my blood count up to a decent level by giving me weekly transfusions in the lab Friday was now set aside in my life as transfusion day, and it was the only day of the week when I now set my alarm clock, for work was still out of the question I used to go up by bus, taking coffee and sandwiches with me A heavy meal on this day was more than I could manage, though I always enjoyed my meal when I got home This was usually wholesome but light—perhaps steamed fish, or something like that I arrived at the lab about 11 o'clock, had my blood count done, and was settled on the "drip" by about 12 30 After taking about a quarter of the blood, I could feel a marvellous sense of smoothness surging over me, my head stopped buzzing, my heart quietened down, and above all the pressure seemed to lift from my eyes—they seemed to open wider I could then settle down to a quiet smoke, and perhaps read the magazine or book I had brought with me I had my lunch about 1 30, and got used to managing with one hand only, as the other was being used for the transfusion My average "drip" was 32 to the minute, I know—I often counted them

My wife could join me after lunch I usually finished about 5 o'clock, and then we went home by bus I think I was pretty fortunate in not having many rigors or reactions to the transfusions though there were odd times when things were not so good one day, on getting off the bed I suddenly developed nettlerash, but this was short lived once the doctor had given me an injection It would be untrue to say I never had a rigor, I have known what it is to feel very bad pains in my legs, groins, and back, and find myself shivering and shaking all over with a temperature of 101°F On such occasions I used to sit by the fire in the lab and take things easy until I had got back to normal, before going for my bus After my evening meal I used to go straight to bed with a hot water bottle, and sleep until lunch time next day

This went on for two years, during which I was always looking forward to a time when the period between transfusions could be lengthened This never seemed to come and sometimes the future seemed hopeless I think the first twelve months were the most trying, because I could not concentrate and everything was a trouble But I rather looked forward to my weekly visit to hospital, for otherwise I could not get about much, and I knew the doctors were doing their utmost In the second year I seemed to regain some of my former energy and concentration, and was able to knock about a little more, pottering about the garden, and even playing bowls in the park and visiting the open air baths. I did not feel any after effects from these strenuous pastimes, and I could even take short rides on my bicycle I had gradually become used to the changed ways which my illness had thrust upon me, and was determined that if I was not for this world for long, at least I would enjoy myself in a quiet way with my wife and friends for as long as possible We managed to be content and keep cheerful, and even spent a day at Old Trafford watching England and the Australians, including the famous Don Bradman But it was a typical wet Manchester "Test" day, and I caught a bad cold, which developed into bronchitis By the next transfusion day my blood count had fallen more than usual I had to go down to the hospital for an extra pint on a second day that week Through it all my wife helped me tremendously, she never complained and was always cheerful

The amazing thing is that my recovery was not gradual, as I had always expected, but just as sudden as my illness One night, at the end of March, 1949, I had very bad pains in my groins and upper portions of my legs They often used to come on at bed time, but this time, though my wife massaged me and gave me a hot water bottle, the pain became so acute I simply had to get out of bed and walk about to try and get a little relief After about an hour or so, it subsided, leaving me perspiring and weak It seemed to me very similar to a reaction after a transfusion, though I had had no reaction at the time of the transfusion that week For about a month I really suffered, so much so that I began to think I was at last breaking up Then, as suddenly, these attacks ceased, and never occurred again, and the curious thing is that I started producing my own blood from about then

On May 27, 1949, my hæmoglobin had bumped up in a week from around the 70s to 96%, and the thing I had so long been hoping for happened at last—I actually missed a transfusion My wife would not believe me, she thought I was joking, and we didn't dare to mention it to anyone in case it was a fluke I still had to go down prepared for a transfusion each Friday, and could not believe my ears when each time the news was good So it went on through the summer, and what a glorious summer it was—not only because of the weather, though even this excelled itself, but because after 83 transfusions I had at long last begun to make my own blood again

I have thanked God for the people in this troubled world today who give so freely of their blood, but all the same I felt a free man when I was no longer depending on them for life We went away for a few weeks to the seaside, where I swam and knocked about as in the times before my illness I never felt tired or languid, in fact I had untold energy, and on my return in September the doctors advised me to try a spot of work, as I was in such rude health

Now came my reablement at my old job I had to go before the Railway Company's doctor, who told me what a lucky man I was—as if I didn't know!—and so I began working for a living again Those early turns, which mean rising at 5 o'clock in the morning, those night duties and late turns! Still, I shall never grumble again, I am too thankful to be able to work at all I have now been back at work for six months, and it is surprising to find how quickly and easily I have slipped back into line I feel and look very fit, and never cease to marvel at my wonderful recovery To any fellow sufferer my advice is keep your chin up, put your faith in the doctors' skill, and—to use my favourite expression—relax

of administration should be experts in this field, specially trained, properly paid, and chosen on a merit system The use of expert consultants is advised, and by hospital consultant is meant a man in active practice and not one who has made an armchair study of the subject Methods of payment to hospitals are discussed in detail, and the best approach is thought to be to pay hospitals on a cost basis with different ceilings for hospitals providing services of differing scope and standards The authors emphasise that no system of paying hospitals is workable in the absence of good cost accounting on a uniform basis Incentives to encourage doctors to settle in rural areas should include specially provided equipment and facilities, loans or grants for expenses while the new practice is being set up, assurance of sufficient income, and functional affiliation with urban resources

After reviewing the circumstances which underlie the existence of chiropractors, faith healers, naturopaths, and the like, the report recommends the elimination of untrained practitioners from participation in payment under the programme, and the elevation of educational standards of those groups now close to the concept of scientific medicine, "as are certain groups of osteopaths," through financial and technical assistance to approved schools "This could make possible eventual incorporation of such personnel and their teaching institutions and hospitals into the regular ranks of medical personnel serving the public"

On hospital staffing the report remarks that good medical care is impossible to provide in isolation and that it seems desirable to reverse the accustomed "closed staff" arrangements and to allow all licensed practitioners to utilise the hospital provided that they are restricted to activities within their scope and supervised and aided in their work by the whole professional staff of the institution

THE MEDICAL AUDIT

The words "self appraisal" come more naturally to American than British lips, but the sincerity of their use is unquestionable, and we might with benefit study the system of medical audit which has been used for many years by a few leading hospitals in the United States and is now said to be coming into more general favour This is a periodical audit by the entire medical staff of the work performed in the hospital On the basis of comprehensive and uniform record keeping, analyses are compiled which show the morbidity and mortality experience of each service and each individual staff member over a period Initial diagnosis and prognosis are compared with the results of hospital treatment, and the results become the basis for self-education and improvement, for evaluation of new procedures, and for the discovery of sources of poor work in the institution

Everyone will agree with the authors of this report that the quality of medical care neither deteriorates nor improves automatically with the mere establishment of a national programme, and that in the modern technical maze the tendency to lose sight of the individual patient is very strong No service can afford to neglect quality in favour of quantity

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" For many years the physician rigidly restricted the fluid intake of edematous persons, with no voice, but the patient's raised in protest Surgical and obstetric patients were likewise kept at prolonged postoperative or post partum bed rest until critical thought and perhaps the shortage of beds, stimulated the re examination of the evidence There is no statistical evidence that bed rest, or even markedly restricted activity over a prolonged period, advantageously affects either the course or the later sequelæ of myocardial infarction No controlled series of cases has been reported Yet bed rest has long been the *sine qua non* in the treatment of myocardial infarction —Dr C WARREN IRVIN, jun, and Dr ALEXANDER M BURGESS, jun *New Engl J Med* 1950 243, 486

Disabilities

52 APLASTIC ANÆMIA

IT was in June, 1947, that I was stricken with aplastic anæmia Before then I had always had good health and had not needed any time off work at all for sickness during 21 years on the railway I am a relief signalman, special class, which entails working at the largest boxes, the work is heavy and responsible, so it was rather surprising that, though I was beginning to look pretty ghastly even at the start of my illness, I could still cycle to work and manage my shifts without exhaustion

My wife had been urging me to see a doctor, because she had noticed that I was losing my colour in lips, gums, and ears, in fact she said I looked as pale as a corpse I kept answering, "I'm all right—it's only my early turn" (which meant getting up at 5 A M each morning), "I'm probably tired" Anyhow, on the second Sunday in June we were going to see some friends We had a short walk uphill to their house, and half way up I realised there was something really wrong, for my legs just stopped and refused to move, my heart was pounding in my chest, and I could hardly breathe I was carrying a mac over my arm at the time, and my wife had to take it off me—it felt like a ton weight After a rest we continued to the top of the hill, and there and then I agreed to go to the doctor on the Monday, and so I did He said I must see a specialist immediately—he himself could do nothing for me, and could not say what was the matter When I saw the specialist he wanted me to go into the wards for observation I did not relish the idea, but in I went

It was the first time I had been in hospital as a patient, and after the first few days I was confined to bed, which made me realise how ill I was After about 10 days I was given my first transfusion Since I had read that these were only given in emergencies, and since I had already failed to respond to liver injections, I thought I must be in a sorry plight I went through all manner of examinations, and though I didn't like them I was able to take them as a matter of course, for I know well enough that if a machine breaks down it is necessary to examine the workings to find the fault One day I was sent by ambulance to see a doctor at a hospital which has a special department for blood diseases This seemed to show I was suffering from a very obscure disease, and secretly I felt rather pleased that I was getting someone important to delve further into things When you've been lying in bed for three weeks such small things as this seem to relieve the monotony, and I quite enjoyed my day out with my wife, even if it was only a trip from one hospital to another in an ambulance And this was the first time I had seen the inside of a lab The doctor there wanted me transferred to his care, and a week later my wife escorted me there I once more had to undergo many tests and X ray examinations, but I was in good hands, and the quiet efficiency of the department of hæmatology inspired me with new hope

My first blood transfusion had not been a very pleasant experience, but after about half a dozen I began to take them as a matter of course, my biggest worry being my apparent lack of veins One day, one of the doctors said he would like to try a marrow transfusion, to see if it would help my marrow to start its own blood production once more, and he very kindly gave me some of his own marrow So far as I know, no material value resulted from this experiment, apart from showing that my marrow was only dormant and not dead, but I shall always be grateful to the doctor After about six weeks, when they had built my strength up with blood transfusions, I was allowed to go home

Parliament

Dangerous Drugs (Amendment) Bill

IN the House of Commons on Nov 9, this Bill was introduced and read a first time It removes limitations on the extension to Northern Ireland of Acts amending the Dangerous Drugs Act, 1920 It also makes other amendments of law made necessary by the supersession of the League of Nations by the United Nations

QUESTION TIME

Kingston Victoria Hospital

Mr J A BOYD CARPENTER asked the Minister of Health what decision he had taken as to the future of this hospital and what steps he was taking to ensure that facilities for treatment of the patients in the hospital would continue to be available to general medical practitioners in this district —Mr ANEURIN BEVAN replied This hospital is to be used as a gynæcological unit The Surbiton annexe hospital is to be converted to give alternative facilities to general practitioners

Mr BOYD CARPENTER When is the Surbiton annexe to be converted and what is to happen to the patients during the interval before the conversion is completed ?—Mr BEVAN Arrangements are being made for the other patients, and the Surbiton annexe will be furnished and refurbished as soon as we are aware that the general practitioners are prepared to make use of it Mr BOYD CARPENTER Is the Minister aware that there are at the moment 37 patients in this hospital who are seriously ill, that the regional board is making every effort to close it and that no alternative exists at present ?—Mr BEVAN The hon member must take it for granted that whenever a hospital is changed from one specialty to another arrangements are invariably made for the care of the patients Mr BOYD CARPENTER gave notice that he would raise the matter again at the earliest opportunity

Advertised to the Public

Mr GEORGE JEGER asked the Minister, in view of the difficulties of National Health Service doctors in resisting the demands of patients for prescriptions for medicinal preparations advertised direct to the public, what steps he proposed to take to deal with this matter —Mr BEVAN replied Responsibility for prescribing should rest solely on the judgment of the doctor Sir Henry Cohen's committee on prescribing therefore recommended that publicly advertised preparations should not be prescribed under the National Health Service This recommendation has been sent to all doctors, who have been asked to observe it, and any doctor who refuses importunate demands has my full support

Mr JEGER Is the Minister aware that there is a section of the medical profession that has been organised to collect funds to resist the health service, and would he appeal to them to divert these funds towards the education of the medical profession in the direction which he has just outlined ? —Mr BEVAN From the preliminary information at our disposal, I believe that the recommendation of Sir Henry Cohen s committee is being carried out generally I would not like to believe that the doctors require any further education, but if they do require it we shall, of course consider what we have to do

Mrs JEAN MANN Is the Minister aware that many doctors are greatly perturbed at the wide latitude allowed to them for over prescribing and that many are protesting and asking that the old procedure, whereby prescriptions were properly scrutinised, should be reintroduced ?—Mr BEVAN Yes I believe that is so, but that is a different question

Hearing-aids Bone-conduction Types

Mr A J CHAMPION asked the Minister of Health if he would extend the provision of hearing aids to include bone conduction types —Mr BEVAN replied Yes, but I can do so only after the necessary technical investigations are complete and as soon thereafter as production can be organised

Priority Food Rations for Tuberculous Patients

Miss M P HORNSBY SMITH asked the Minister of Food what priority food rations were granted to people suffering from tuberculosis, and what alterations in such priorities had been made this year —Mr MAURICE WEBB replied three eggs a week, and a double ration of butter or margarine which at present gives an extra 4 oz Before June this year the weekly allowances were three eggs, an extra 3 oz of butter or margarine and an extra ounce each of cooking fat and bacon When milk was controlled the priority supply was 14 pints a week

Transferred Patients

In answer to an inquiry why the names of 5 people, all of whom had been his patients for over twenty years, had been removed from the list of Dr A Green, 385, Erith Road, Erith, Mr BEVAN replied that Dr Green had a list of 520 patients, the normal agreed maximum being 4000 As Dr Green would do nothing to help the executive council to meet this situation, they had to take whatever steps seemed best to them On the whole, Mr Bevan thought, they had acted reasonably, in difficult circumstances

Pay of Medical Personnel in the Services

Replying to a question by Wing Commander N J [illegible] who asked the Minister of Defence if he would make a statement in regard to the pay increases for the medical branches of the Services, Mr EMANUEL SHINWELL said this matter had been very complicated but he hoped to make an announcement shortly

Corporal Punishment for Crimes of Violence

Replying to questions, Mr CHUTER EDE *Home Secretary* said he was satisfied that the penalties prescribed by law for crimes of violence were adequate The Government had no intention of reintroducing corporal punishment, which after full discussion was abolished as a judicial penalty by section 2 of the Criminal Justice Act, 1948 That Act marked a notable advance in the treatment of offenders, and it would be premature to consider further changes in the law until more experience had been gained by its working The curious thing was that the offences not previously punishable by flogging had increased 25 76%, while those punishable by flogging had increased by only 1 93% since the repeal of the power to flog

Currency for Tuberculosis Treatment Abroad

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Letters to the Editor

REGISTRARS

SIR,—Mr Bevan's solution of the excess registrar problem will rate him with George Washington as an axe wielder Having spent sixteen years since leaving school growing big enough to be worth chopping down, I can provide a better solution It is simply to make eight hundred senior registrars into consultants without more ado This, at one blow, will restore a favourable balance and relieve the alleged shortage of consultants both in the Services and the National Health Service It will also have the merit of pleasing the registrars, which cannot be said for Mr Bevan's plan It may not, of course, please the present consultants

Royal Infirmary
Bradford

J C ANGELL
Senior Surgical Registrar

SIR,—There is a difficulty in arriving at a satisfactory registrar establishment which is only touched on in your last issue but is more fully discussed in the *Times* of Nov 10 This is that the number of consultant posts available is very small, while many hospitals urgently require a larger number of senior registrars to get the work done

There is a very simple solution for this problem which nobody seems to mention It is to prolong the period of tenure of the senior posts If these were tenable for a total of six years, for instance, hospitals could employ double the number of registrars for the same number of trained men produced since the frequency of vacancies for registrars would be reduced by half

With present salaries this would be no hardship to the registrars and can one maintain seriously that a senior registrar after three years is a fully trained consultant at, possibly, the age of 29 ?

SENIOR REGISTRAR

NUTRITION AND ANTIBODIES

SIR,—In your leading article of Oct 28 you say that "the importance of the lymphocyte in antibody production is now well established," and refer to three reports

McMaster and Hudack[1] and Oakley et al[2] made fundamentally the same experimental approach—i e, estimation of antibody ratios within regional and contra lateral lymph glands after antigen injections No histological descriptions are given and the particular cell responsible for antibody production remains a matter for conjecture Ehrich and Harris[3] carried out antibody extraction studies on rabbits, using the popliteal gland after subcutaneous injection of antigen into the feet and these experiments warrant the conclusion that under these conditions antibody was being manufactured or stored in this lymph gland These workers examined histologically the lymphoid tissues involved, and they also examined the cells within the efferent lymph during the period of antibody production They concluded "The fact that the tissue response accompanying the formation of antibodies was chiefly a lymphocytic one, points to the lymphocyte as a factor in the formation of antibodies" However, Ehrich et al.[4] later came to a quite different conclusion, they found from a study of the lymphoid tissues during the initial period of antibody production, that the cellular response was chiefly one of plasma cells Furthermore "The present study of sections through efferent lymph vessels suggests that some of the lymphoid cells that leave the lymph node during the period of antibody production are plasmoblasts and plasma cells" And "these results are interpreted as indicating that the plasma cell and not the lymphocyte is responsible for antibody production"

In view of these facts, the interpretation of the results of Stoerk et al[5] (impairment of antibody response in the pyridoxine deficient rat) in terms of the cytology of the lymphoid tissues, must await clearer elucidation of the status of the lymphocyte as an antibody producing cell

London Hospital E 1

R G WHITE
A H E MARSHALL

1 McMaster P D Hudack S S *J exp Med* 1935 61 783
2 Oakley C L Warrack C H Batty I *J Path Bact* 1949 61 179
3 Ehrich W F Harris T N *J exp Med* 1942 76 335
4 Ehrich W F Drabkin D L Forman C *Ibid* 1949 90 157
5 Stoerk H C Flinn H N *Proc Soc exp Biol N Y* 1946 62 88 Stoerk H C Flinn H N John H M *J exp Med* 1947 85 36

THE KEMPNER RICE DIET

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London W C 1

E F MEYER

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No educational body expects to recover its costs from students' fees alone, and these and the grant received from the Ministry of Education are quite inadequate to meet the pressure on the college's resources and the rising expenses of lectures and tutorial fees equipment, laboratory material, and building maintenance Up to now the nurses themselves have made good the deficit, but they cannot continue to foot the bill Is this valuable work to be restricted for lack of funds ?

If what the medical profession required of our nurses today were a blind unthinking obedience, such an eventuality might be of no great consequence But the advances of medicine, and the obligations of the Health Service, make this out of the question Today the doctor needs a colleague who will follow his line of reasoning, will realise the whys and wherefores of his treatment, and note the significance of untoward symptoms He needs, besides, someone who can inspire her own subordinates and infuse them with the team spirit and her own keen sense of loyalty A nurse's working life is not as long as it should be, but how much she can do, if properly prepared for her task, to fashion the generation who will come after For this reason we cannot ignore the importance of further training for posts of leadership in nursing

Here is something which is not paid for by the National Health Service The educational work of the Royal College of Nursing was founded and developed by nurses, who treasure its creative independence, and we are appealing for £500,000 to put this work on a firm financial basis The nurses themselves have undertaken to raise half the sum and everywhere—in Scotland, in Northern Ireland in England and Wales—they are

Letters to the Editor

REGISTRARS

SIR,—Mr Bevan's solution of the excess registrar problem will rate him with George Washington as an axe wielder Having spent sixteen years since leaving school growing big enough to be worth chopping down, I can provide a better solution It is simply to make eight hundred senior registrars into consultants without more ado This, at one blow, will restore a favourable balance and relieve the alleged shortage of consultants both in the Services and the National Health Service It will also have the merit of pleasing the registrars, which cannot be said for Mr Bevan's plan It may not, of course, please the present consultants

Royal Infirmary
Bradford

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Senior Surgical Registrar

SIR,—There is a difficulty in arriving at a satisfactory registrar establishment which is only touched on in your last issue but is more fully discussed in the *Times* of Nov 10 This is that the number of consultant posts available is very small, while many hospitals urgently require a larger number of senior registrars to get the work done

There is a very simple solution for this problem which nobody seems to mention It is to prolong the period of tenure of the senior posts If these were tenable for a total of six years, for instance, hospitals could employ double the number of registrars for the same number of trained men produced, since the frequency of vacancies for registrars would be reduced by half

With present salaries this would be no hardship to the registrars, and can one maintain seriously that a senior registrar after three years is a fully trained consultant at, possibly, the age of 29 ?

SENIOR REGISTRAR

NUTRITION AND ANTIBODIES

SIR,—In your leading article of Oct 28 you say that "the importance of the lymphocyte in antibody production is now well established," and refer to three reports

McMaster and Hudack[1] and Oakley et al[2] made fundamentally the same experimental approach—i e, estimation of antibody ratios within regional and contra lateral lymph glands after antigen injections No histo logical descriptions are given and the particular cell responsible for antibody production remains a matter for conjecture Ehrich and Harris[3] carried out antibody extraction studies on rabbits, using the popliteal gland after subcutaneous injection of antigen into the feet, and these experiments warrant the conclusion that under these conditions antibody was being manufactured or stored in this lymph gland These workers examined histologically the lymphoid tissues involved, and they also examined the cells within the efferent lymph during the period of antibody production They concluded "The fact that the tissue response accompanying the formation of antibodies was chiefly a lymphocytic one, points to the lymphocyte as a factor in the formation of antibodies" However, Ehrich et al[4] later came to a quite different conclusion, they found, from a study of the lymphoid tissues during the initial period of antibody production, that the cellular response was chiefly one of plasma cells Furthermore "The present study of sections through efferent lymph vessels suggests that some of the lymphoid cells that leave the lymph node during the period of antibody production are plasmoblasts and plasma cells" And "these results are interpreted as indicating that the plasma cell and not the lymphocyte is responsible for antibody production"

In view of these facts, the interpretation of the results of Stoerk et al[5] (impairment of antibody response in the pyridoxine deficient rat) in terms of the cytology of the lymphoid tissues, must await clearer elucidation of the status of the lymphocyte as an antibody producing cell

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1 McMaster P D Hudack S S *J exp Med* 1935 61 783
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at work We are asking the general public to raise the other half

Doctors will, we think, wish to associate themselves with an appeal which so intimately concerns their work and their patients' welfare Any donation from them, however small, will be gratefully acknowledged by the undersigned.

EDWINA MOUNTBATTEN OF BURMA
President,
Educational Appeal Fund

Royal College of Nursing
Henrietta Place
Cavendish Square
London W 1

HORDER
Vice President.

SIGNIFICANCE OF COLOURED LINEÆ DISTENSÆ

SIR,—On reading Dr Simpson's letter (Sept 23) it occurred to us that these lineæ developed without clinical evidence of endocrine imbalance We therefore investigated all the patients in the pleural effusion unit of this hospital—56 men and 37 women—who are suffering from tuberculous pleural effusions, minimal pulmonary tuberculous lesions, or tuberculous ascites Their ages range from 14 to 43 years

Of these 93 patients, 39 (23 men and 16 women) bear red or purple lineæ—an incidence of 41 8% (men 41%, women 43%) The average gain in weight of the group with lineæ was 4 7 lb per month (men 4 3 lb, women 5 25 lb), while that of the group without lineæ was 2 2 lb (men and women 2 2 lb) Further, the smallest average gain per month in the group with lineæ was 1 5 lb, and none of the 18 patients gaining at less than this rate developed lineæ The distribution of the lineæ is usually over the loins, hips, sacrum, and lateral aspects of the upper thighs, the lineæ usually lie horizontally

We have also recently seen patients suffering from conditions other than tuberculosis who had developed coloured lineæ during a period of rapid gain of weight None of these patients showed clinical evidence of endocrine imbalance Could not the lineæ be caused by rapid increase in weight combined with local trauma from pressure and stretching of the skin? Does Dr Simpson consider that hypersecretion of adrenal cortex hormones is responsible for this high incidence of red lineæ distensæ in our patients?

Queen Mary's Hospital
Sidcup Kent

N F CROFTS
N K MACRAE GIBSON

*** This letter has been shown to Dr S L Simpson, who replies as follows

Similar findings have been reported from Colindale Hospital by Hurford and Snell [1] who established that in a group of male patients with pulmonary tuberculosis, aged 12–26 the incidence of coloured lineæ distensæ was 45% They noted, as I had with adipose gynandrism, that after months or years the red lineæ became white, and they referred to previous accounts of which three are particularly relevant Allesandri [2] in 1931 described such striæ with pulmonary tuberculosis and believed that they appeared in young patients because of their more active endocrine glands and that they developed during exacerbation of the disease with increasing toxæmia Robertson and Goodall [3] described such striæ occurring in the course of typhoid, dysentery, rheumatic fever, septic wounds and lymphadenoma (to which Hurford and Snell add 1 pneumonia 1 asthma 2 dysentery 1 tonsilitis, and 1 appendicitis) In 1928 Parkes Weber [4] postulated as possible causes such factors as stretching of the skin rapid growth at puberty, and disturbed pituitary function during toxæmia

Now what does all this evidence mean? It is clear that red or purple lineæ distensæ may appear in the course of a variety of infections, with a high incidence among tuberculous adolescents and young adults, and that during the development of the lineæ increase of weight is common though not necessarily present We know too, that red lineæ distensæ are very often found in Cushing's syndrome, a disorder associated with hypersecretion of 'Cortisone' or a cortisone like substance [5], in pregnancy where a similar hypersecretion has been proved [6]; in adipose gynandrism and gynism, syndromes whose nature is still in doubt, and during puberty in certain constitutional endocrine types accepted by many as normal On the experimental side we have the classical adaptation syndrome experiments of Selye, and the work of Dougherty and his colleagues,[7] indicating the importance of the adrenal cortex in the production or augmentation of immune processes On the therapeutic side we have the work of Sprague and his associates previously referred to (Sept 23, p 415), which appears to exclude the post-propter argument, and accumulating exploratory knowledge of the usefulness of cortisone or ACTH in some infections

Surely all this indicates that coloured lineæ distensæ can be interpreted fairly confidently as a manifestation of the hypersecretion of cortisone and cortisone like substances by the adrenal cortex The valuable additional evidence published in your columns seems to me to strengthen this view Incidentally, the high incidence of such lineæ in young patients suffering from various forms of tuberculosis would appear to raise the question of the place of cortisone or ACTH as an adjuvant to therapy, and it is fortunate that the adverse effect of cortisone on experimental tuberculosis, recorded by Dr D'Arcy Hart and Dr Rees (Sept 23), appears at this moment"

1 Hurford J V Snell W E *Tubercle* 1943 24 16
2 Allesandri C *Riv Pat Clin Tuberc* 1931 5 635
3 Robertson J D Goodall E W *Proc R Soc Med* 1931–32 25 213 803
4 Weber F P *Brit med J* 1928 1 255 *Urol cutan Rev* 1932 36 731
5 Forbes A P Griswold G C Albright F *J clin Endocrinol* 1950 10 230
6 Venning E H *Endocrinology* 1946 39 205
7 Dougherty T F Chase J H White A *Proc Soc exp Biol N Y* 1948–58 135

MASS MINIATURE RADIOGRAPHY

SIR,—I found Dr Beynon's letter last week most interesting Both mass radiography units in the Oxford region have been using this no undressing technique, exactly as described by him for just over twelve months following on trials of the method in June 1949

The trials were carried out by Dr W T Bermingham then director of the Northampton unit, and by myself, being both concerned to enhance the appeal of mass radiography and aware that similar techniques had been in successful use in other countries for some years The films showed no falling off in quality compared with those previously produced by orthodox methods, and the technique was adopted, with confidence, for routine use

When the results of "repeat" surveys conducted in the past year are to hand, a better assessment of the method will be possible It is still regarded as subject to review, though from the viewpoint of appeal it has already proved of great value, and in several other ways has contributed towards simplifying the present somewhat cumbersome methods of mass radiography

R T JAMES
Medical Director
Mass Radiography Units
Oxford Region
Reading

THE "UNESTABLISHED" PRACTITIONER

SIR,—Principals with inadequate lists, assistants without a view to partnership and other unestablished general practitioners comprise a section of our profession for which too little is being done It is widely recognised that the arrangements for entry into general practice as a principal are at present grossly unsatisfactory It is extremely difficult to obtain an assistantship with a view, there are insufficient executive council vacancies to satisfy the demand, and in most parts of the country, the outlook for the "squatter" is bleak Many assistants face poor prospects and undesirable conditions of employment, while the entrants into general practice who have achieved the status of principal, but who have

only small lists of patients, are commonly finding that they have little hope of significantly increasing the size of their practices within a reasonable time

Little is being achieved by the numerous individual complaints which are being expressed both in private and in the medical press A growing number of "unestablished" general practitioners who have been discussing the state of affairs outlined above have come to the obvious conclusion that doctors who are placed in the unfortunate circumstances to which I have referred should get together in order to present their case for a "square deal" An open meeting has therefore been arranged and will be held at the Russell Hotel, W C 1, on Wednesday, Nov 29, at 8 15 P M It is hoped that doctors concerned will endeavour to attend this meeting, as it is clearly important that the views of as many as possible should be heard and discussed

A statement on the professional problems of assistants and other "unestablished" (or inadequately established) general practitioners has been prepared This statement also contains suggestions by which improvements for this section of our profession could be effected I should be pleased to send a copy to anyone interested

145 Upper Clapton Road
London E 5 H REZLER

CARE AND MANAGEMENT OF LABORATORY ANIMALS

SIR,—In 1947 we issued the UFAW Handbook on the Care and Management of Laboratory Animals, edited by Prof A N Worden, M R C V S May we again appeal to all persons interested in laboratory animals to send us suggestions for the improvement of the handbook and any additional information which has come to their notice? The subjects on which information is required are

The training of animal technicians, animal houses and animal rooms, rabbits, guineapigs, rats, mice, voles, hamsters, hedgehogs ferrets, frogs and other amphibians, fish, anthropoids, dogs, cats, goats, poultry, canaries, pigeons, or any other species of animals used for scientific purposes

Subject matter can be conveniently forwarded to us grouped under the headings of anæsthesia, euthanasia, supply and breeding, feeding and watering, general management and hygiene, transport by sea, land, and air, and animal behaviour and psychology

Universities Federation for Animal Welfare
284, Regent s Park Road London, N 3
F JEAN VINTER
Technical Secretary

POSTURE

SIR,—In his letter of Sept 30, Dr Barlow quotes from an article by Prof Raymond Dart [1] in which he discusses "the muscles which look after the relationship of the head with the vertebral column in man" Dr Barlow may not be aware that Professor Dart has acknowledged indebtedness in this connection to a pamphlet which I published in 1937 At that time I wrote

"An examination of a schema of the base of the skull showing the plotting of all muscles therein inserted will show that, while there is a preponderant mass of muscles inserted posterior to the foramen magnum, there is, anterior to the foramen magnum, a very feeble grouping of muscles Observations of the living subject will at once reveal that the common misuse of the semispinalis capitis, the splenius capitis, the sterno mastoid, and the trapezius muscles leads to a retraction and depression of the back of the head and an overbalancing of the primary group of muscles whose function is to maintain the relation of the head to the cervical spine"

The group of muscles which I named primary, inasmuch as I claimed that their action determined all further relationships in living man, comprised the atlas occipital, axis occipital, and atlas axis muscles, all taken together

I am not interested in claiming any credit for myself in having made this observation, but I am most anxious that credit should be given to Mr F Matthias Alexander, whose teaching showed me that experience in the employment of his technique enabled an investigator to obtain the advantage described in the title of my pamphlet—namely, a "Reorientation of the View Point upon the Study of Anatomy"—and thus the attainment of means whereby a person might make constructive observations on the fundamentals of human physiology

Bolton MUNGO DOUGLAS

1 Dart R *S Afr med J* 1947 21 74

THEORY OF BARBITURATE ACTION

SIR,—I thank Mr Crossland (Oct 21) for his interest in the theory I put forward in your issue of Oct 7 His method [1] is to estimate the acetylcholine (ACh) protein complex in the brain, which he states has no physiological ACh action It seems that it may be formed by resynthesis of the ACh previously hydrolysed by cholinesterase [2] This complex might thus be a depot for ACh, and, in the presence of thiamine, might be made available as required by the central nervous system Therefore, one might expect the "store" of ACh complex in the brain to be increased whenever the ACh content of the cerebrospinal fluid (C S F) is decreased by any interference with its metabolism—e g, by narcotics or general anæsthetics

Whatever the accuracy of this theory, certain facts need to be explained (1) the diminished production of ACh in the stomach and intestine perfused with a barbiturate solution, especially on stimulation of the vagus nerve [3], (2) in man, the neutralisation by barbiturate of the diuretic action of thiamine [4], and (3) the inhibition by barbiturate of the growth of staphylococci (which need pre formed thiamine) in broth—an inhibition that can be reversed by the addition of thiamine to the medium [5] (This observation was made since I last wrote)

I think all these constitute good evidence that barbiturates and thiamine are antagonists The increase of ACh in the C S F after epileptic attacks, mentioned by Mr Crossland, might well be due to decreased production of cholinesterase

Dublin H W DALTON

1 Richter D Crossland J *Amer J Physiol* 1949 159 247
2 Nachmansohn D *Fol Horm* 1945 3 337
3 Trethewie E R *Aust J exp Biol med Sci* 1942 20 9
4 Floro C *Klin Wschr* 1938 17 1001
5 Dalton H W Unpublished work

THE R M B F

SIR,—Again I appeal to members of the medical profession, whether subscribers to the Royal Medical Benevolent Fund or not, to send a donation for Christmas gifts for beneficiaries of the fund, all of whom are facing a time of special difficulty owing to the high cost of living

Last year it was decided to send each beneficiary a gift of £10, but the donations to the Christmas gifts fund were not enough to meet the cost, and half of this sorely needed help had to be taken from general funds This cannot be done this year owing to the present heavy calls on the fund

I hope that there will be a generous response to this special appeal for Christmas gifts, which are not only desirable but necessary and are most deeply appreciated Let us warm the hearts of the beneficiaries of the fund by showing them that they are not forgotten by their more fortunate colleagues

Royal Medical Benevolent Fund
1, Balliol House Manor Fields
London S W 5
WEBB JOHNSON,
President

Obituary

JOHN HUBBACK ANDERSON

C.M.G., C.B.E., M.D. MELB., F.R.A.C.P.

Colonel Anderson, physician to Ruthin Castle, died on Nov. 4 at the age of 67.

He was born in Urana, New South Wales, and educated at Longford Grammar School in Tasmania. For a time he worked in a lawyer's office in Launceston, so he entered Osmond College, Melbourne University, in 1904 rather older than the average medical student. He won the respect of his younger fellow students by his high moral and spiritual standards; he took part in all the college activities and rowed bow for the college eight. After qualifying in 1908 he continued at the university as senior demonstrator of anatomy, taking the M.D. degree in 1911. After a period as assistant physician at St. Vincent's Hospital, Melbourne, he settled in practice at Benalla, in Victoria, but he enlisted in the Australian Imperial Force at the beginning of the 1914 war. From Gallipoli he was invalided with severe dysentery; but after a time in Egypt he accompanied the Australian Forces to France as D.A.D.M.S. Later he was transferred to Australian headquarters in London, where he became the right-hand man of Major-General Sir Neville Howse, V.C. Thus another generation of Australian doctors came under the influence of his just and upright honesty in dealing with difficult situations and men. For his overseas service he was twice mentioned in despatches and he was appointed C.M.G. and C.B.E.

After three years in his old post in the Melbourne anatomy school, where he also acted as professor in the absence of Prof. R. J. A. Berry, Anderson returned to England with his wife and two children. In 1924 he joined Ruthin Castle Clinic as assistant physician.

He served the clinic and the local community until his death, except for the years of the late war when he was called back to act as liaison officer in London between the Australian Commonwealth Medical Forces and the War Office. This work was a great strain on a man of his years and conscientiousness. He had to attend innumerable committees and conferences and twice during the war he flew to Australia. His war-time association with Australia continued afterwards and he acted as London correspondent of the *Medical Journal of Australia*. He felt greatly honoured by his election to the fellowship of the Royal Australasian College of Physicians in 1947. His honesty, frankness, and good humour made him an excellent chairman and interpreter of the sense of meetings, and he had a fine record of service in North Wales. Besides his work for the British Medical Association he served as district commissioner for Boy Scouts and was largely instrumental in raising funds for building the local scout hall; he was president of the local branch of the British Legion, and as a justice of the peace he became chairman of the Ruthin children's court.

S. W. P. writes: "Anderson came of a robust North of Ireland stock. He learned many sound views from his father, the late Dr. J. F. Anderson, of Woodend, Victoria, and he used to say he learned much from his patients while in private practice before the first world war. His training made him a clear and accurate thinker, and a kind good doctor. Tributes from former patients all express a sense of personal loss at his passing. Nothing was too much trouble for him; the smallest detail of treatment, the little more that made for his patients' comfort and security, all received his closest attention. Another group of men scattered throughout the world will mourn the death of Jock Anderson: students he taught to think clearly and accurately, fellow workers impressed by his shining example of honesty and hard work, and friends who trusted his straightness and loyalty."

Anderson married Ruby Clare Moffatt in 1919. She died in 1937, and he is survived by a son and a daughter. His younger brother practises ophthalmology in Melbourne.

SAMUEL THOMPSON ROWLING

M.D. LEEDS, F.F.A.R.C.S.

Dr. S. Thompson Rowling, visiting anæsthetist to the Leeds General Infirmary, who died on Oct. 12, at the age of 76, was a pioneer in his specialty and one of the city's foremost general practitioners. He also held the appointment of lecturer in anæsthesia in the University of Leeds.

The son of Samuel Rowling, he was born at Headingley and educated at Leeds Grammar School, Yorkshire College, and Manchester University. In 1896 he graduated at the old Victoria University, and after holding house-appointments at the Leeds General Infirmary he settled in practice in the city. He was appointed anæsthetist to the Infirmary in 1910. In 1920 he took his M.D. and in 1935 his D.A. He was elected to the fellowship of the Faculty of Anæsthetists in 1948.

R. C. L. writes: "Besides his medical work Rowling found time to interest himself in the Church Army and the St. John Ambulance Brigade. A non-smoker and total abstainer, he was one of the most highly valued lay preachers in the diocese. His inventions included the well-known Rowling chloroform bottle, and more recently he was concerned in the production of the Ringrose-Rowling-Harbord carbon dioxide indicator. In the most serious anæsthetic emergencies he was always level-headed and courteous, and his services were valued by the surgeons with whom he worked."

He leaves a widow and three children, two of whom are doctors.

FREDERICK HENRY DODD

M.R.C.S.

Dr. F. H. Dodd, who died at his home on Aug. 17, was known for his outstanding work in the residential care of children with psychological problems.

Qualifying from Guy's Hospital in 1914 he became interested in psychiatry, and especially child psychiatry. After holding a resident post at the Evelina Hospital, London, he became an assistant physician to the Queen's Hospital for Children, and later first assistant in the children's department at Guy's Hospital under Dr. Charles Cameron. He was also on the staff of the Tavistock Clinic.

During the 1914–18 war he served as a captain in the R.A.M.C., and he continued to serve on medical boards as a heart specialist. His was therefore no narrow specialisation: throughout his career he retained his interest in general medicine, and he always worked with both adults and children.

After his marriage he and his wife for 25 years ran a private residential school for children who had failed to make progress in a larger school. In 1940 when the school was moved to Dorset, he also served as psychiatrist to hostels for evacuee children throughout North Dorset. After the war he resumed a consulting practice in Sherborne, and only retired from running his school in 1949. He then went to Oxford, where he and his wife, a daughter of the late Professor Lodge, had many friends, and here he had hoped to continue his consultant practice.

E. M. C. writes: "Dr. Dodd believed that in all work for children with difficulties it was important to re-create the family setting and feeling. His was not a free school in the sense of no discipline and regulations but it was headed by Dodd, who with his wife shared their family life closely with all the children. They relied far more on a broad basis of cultural living and education than on specific methods or on clinical psychotherapy. His book *Common-sense Psychology and the Home* in which his wife collaborated, expresses much of his personal philosophy. Here he succeeded in giving a sense of direction to parenthood. He always worked with the child as a whole body, mind, and spirit and in close contact with the parents. Some children placed in his care with misgivings because they had always been ill were never ill with him. This was not the work of a magnetic personality but of a dedicated life, deeply rooted in spiritual faith."

His widow survives him, with three sons and one daughter.

DR FLORENCE LOUIS

"EARLY in the war Dr Louis began to undertake work for London coroners," writes W B P "In my court and that of Neville Stafford she found as colleagues Spilsbury, Donald Teare, and Francis Camps, and she was at once accepted as one of them To this work she brought an original talent, for she never ceased from being a physician When she described the conditions that she had found after death, whether the death was simple and natural or was a violent one, she was describing a patient rather than an inanimate object upon which she had made an examination in the post-mortem room This quality eased the minds of relatives who heard her give evidence, to some of her colleagues in coroners' courts, it was a new approach to the matter Among the members of the team of pathologists who meet each other frequently in the courts of two coroners in London she is missed not only as a friend and a most charming person, who always remained a woman, but as a source of up-to-date information upon any clinical problem with which they were faced As a witness before the coroner or at the Central Criminal Court, she was clear in her language and unshakable in cross examination because of her honesty of expression She never trimmed her evidence to fit what might appear to others as being the most likely combination of facts that would make a consistent whole In my experience, on two occasions after she had held to her opinion, she turned out to have been right, on no occasion was her conclusion found to be wrong"

Births, Marriages, and Deaths

BIRTHS

BARRETT —On Nov 1 in Edinburgh the wife of Dr J S Barrett —a son

BEAUCHAMP —On Nov 9 at Fulmer the wife of Dr Guy Beauchamp—a daughter

BECKETT —On Nov 1 at Ipswich the wife of Dr F H E Beckett —a son

CARR —On Nov 5, in London the wife of Dr R U Carr, M B E —a daughter

EARLE —On Nov 3 at Dereham Norfolk the wife of Dr J E G Earle—a daughter

HUTTON —On Nov 8 in London, the wife of Dr Michael Hutton —a son

MACKENZIE —On Nov 7 at Kelvedon Essex the wife of Dr A G Mackenzie—a son

MAITLAND —On Oct 31 in London the wife of Dr F G Maitland —a daughter

MOORE —On Oct 31 the wife of Dr T S Moore—a daughter

ORMEROD —On Nov 3 in London W 1 the wife of Dr I M Ormerod—a son

OSTROWSKI —On Nov 3 in Edinburgh the wife of Dr T M Ostrowski—a daughter

PUGH —On Nov 10 at Hartfield Sussex the wife of Dr R J Pugh—a daughter

RUSSELL.—On Nov 5 at Haywards Heath the wife of Dr A J Russell—a daughter

SMYTHE WOOD —On Nov 6 the wife of Dr P Smythe Wood—twin daughters

SWEET —On Nov 3, the wife of Dr H S Sweet—a son

THURSTON —On Nov 4 at Gloucester the wife of Mr J C Thurston M R C O G —a daughter

WHEELER.—On Nov 3 at Sutton the wife of Dr R H Wheeler —a son

YOUNG —On Nov 4 in Ontario the wife of Mr Stuart Young F R C S E —a son

MARRIAGES

EMANUEL—HOFFMANN —On Nov 2 in Birmingham Richard Wolff Emanuel B M to Lavinia Hoffmann

DEATHS

ANDERSON —On Nov 4 at Ruthin Denbighshire, John Hubback Anderson C M G C B E E D M D Melb F R A C P

BLAIR —On Nov 10 in Edinburgh David Blair M A M D Glasg

BRIGGS —On Nov 2 at Auckland New Zealand Isaac George Briggs M R C S aged 58

DANIEL.—On Nov 7 in London Augustus Moore Daniel K B E M A M B Camb aged 83

FLETCHER —On Nov 4 at Rustington Henry James Fletcher M B Edin lieut-colonel R A M C retd aged 90

GROVES —On Nov 8 in London Charles Nixon Groves C B I M A D M Oxfd

HILL.—On Nov 2 at St Margarets at Cliffe Kent Susie Eleanor Hill M D Lond

HUGHES —On Nov 5 Ernest Ethelbert Hughes C B E M Manc F R C S

JAMESON —On Oct 31 in Kenya Ernest Tooke Jameson M D Dubl

KILNER.—On Nov 5 at Fayid Egypt Hugh Pomfret Kilner M B Camb aged 26

O RYAN —On Oct 19 Jeremiah Francis O Ryan M B N U I

SIMMONS —On Oct 8 at Monxton Andover Hants Stewart Septimus Simmons M R C S aged 80

Diary of the Week

NOV 19 TO 25

Monday, 20th

INSTITUTE OF PSYCHIATRY Maudsley Hospital Denmark Hill S E 5
5 30 P M Dr E Stengel Lecture demonstration

HUNTERIAN SOCIETY
8 30 P M (Apothecaries' Hall Blackfriars Lane, E C 4) Mr J H Doggart and Mr J F Eastwood K C Dr J A Fraser Roberts and Prof J B S Haldane F R S That Heredity is More Fateful than is Environment

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
5 P M (Y W C A Shakespear Street Nottingham) Dr C A Boucher Accident Prevention in the Home

Tuesday, 21st

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M (London School of Hygiene, Keppel Street, W C 1) Dr R R Race Blood groups

INSTITUTE OF DERMATOLOGY St. John s Hospital Lisle Street, W C 2
5 P M Dr G B Dowling Cutaneous Tuberculosis

INSTITUTE OF OPHTHALMOLOGY Judd Street W C 1
5 30 P M Mr A G Leigh Diseases of the Uveal Tract

INSTITUTE OF UROLOGY St Paul s Hospital, Henrietta Street W C 2
11 A M Dr S R N Bushby Cultivation and Identification of Pleuropneumonia like Organisms

Wednesday 22nd

KETTLE LECTURE
5 P M (St. Bartholomew s Hospital E C 1) Prof L P Garrod Reactions of Bacteria to Chemotherapeutic Agents

RESEARCH DEFENCE SOCIETY
5 30 P M (University College Gower Street W C 1) Prof E D Adrian O M F R S Experiments on the Nervous System (Stephen Paget lecture)

INSTITUTE OF DERMATOLOGY
5 P M Dr R W Riddell Medical Mycology

INSTITUTE OF UROLOGY
11 A M Dr A H Harkness Local Diseases of the Penis

SOCIETY OF CHEMICAL INDUSTRY
6 15 P M (National Institute for Medical Research The Ridgeway Mill Hill N W 7) Sir Alexander Fleming F R S Mr W J Elford PH.D Mr D A Tanfield Dr W H Hughes Recent Aids to the Study of Microbiology

Thursday, 23rd

ROYAL ARMY MEDICAL COLLEGE Millbank S W 1
5 P M Prof G A Ransome Clinical Experiences During the Burma Campaign

ST GEORGE S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner S W 1
4 30 P M Dr Desmond Curran Psychiatry lecture demonstration

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M Dr J V Dacie Blood Formation

INSTITUTE OF DERMATOLOGY
5 P M Dr I Muende Pigmentary Conditions of the Skin

INSTITUTE OF OPHTHALMOLOGY
5 30 P M. Dr F Stansfield Anatomy of the Ocular Muscles

INSTITUTE OF PSYCHIATRY
3 P M Prof F Goldby The Rhinencephalon

INSTITUTE OF UROLOGY
11 A M Dr W N Mascall Chancroid

LONDON JEWISH HOSPITAL MEDICAL SOCIETY
3 P M (11 Chandos Street, W 1) Mr Maurice Lee Thrombosis and Embolism (Film)

MEDICO LEGAL SOCIETY 26 Portland Place W 1
8 15 P M Dr F E Camps The Case of Stanley Setty

HONYMAN GILLESPIE LECTURE
5 P M (Edinburgh University Anatomy Theatre) Dr R M Marquis Differential Diagnosis in Acyanotic Congenital Heart-disease

TORQUAY AND DISTRICT MEDICAL SOCIETY
8 30 P M (Torbay Hospital Torquay) Dr E C Warner Medical Aspects of Hypertension

Friday 24th

MAIDA VALE HOSPITAL MEDICAL SCHOOL Maida Vale W 9
5 P M Dr Marion Greaves Clinical neurological demonstration

BRITISH TUBERCULOSIS ASSOCIATION 26 Portland Place W 1
3 15 P M Dr Peter Kerley Dr Norman Smith Dr Owen Clarke Mass Radiography

MEDICO CHIRURGICAL SOCIETIES OF EDINBURGH AND GLASGOW
8 30 P M. (Royal Faculty of Physicians and Surgeons 242 St Vincent Street Glasgow) Sir James Learmonth Pathological Physiology of Peripheral Vascular Disease

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES
11 Chandos Street W 1
8 P M Dr T Guthe World Health and Treponematoses

The *Scottish Chemists Index of Modern Remedies* (fifth series) is designed like its predecessors, to provide in compact form 'a guide to the prescriber and a ready reckoner to the pharmacist' Into its 86 pages is compressed a remarkable amount of up to-date information concerning not only proprietary preparations but also the new *British Pharmacopœia B.P C* and *National Formulary* The index price 5s, is obtainable from the *Scottish Chemist* 210, Albert Drive, Pollokshields Glasgow S 1

Notes and News

MANX CRISIS

THE withdrawal from the health service of 33 of the 40 chemists on the Isle of Man marks the climax of a long dispute with the Manx Health Services Board The quarrel began when the board decided to effect an economy by levying a 6d charge on all prescriptions, and a fee on containers an order to this effect was passed by the Manx parliament, and came into force on Oct 1 The money was to be collected by the doctor or chemist who dispensed the medicine, but the Medical Society and the Chemists' Association strongly opposed it and instructed their members to disregard it they say that it is impracticable, and that the Advisory Council should have been consulted before it was introduced The latest development—withdrawal of the chemists from the service—was precipitated by the alleged refusal of the Lieut Governor to receive a chemists' deputation, or to allow the matter to be referred to arbitration. It is noteworthy that it was the doctors support which decided the chemists attitude six weeks ago when they were preparing to yield to the board "under protest"

SUBJECTIVE JUDGMENTS

THE use of man as a meter to measure his surroundings was the subject of a Conference on Subjective Judgments held at University College, London, on Oct 14 Nearly 200 physicists, engineers, and psychologists discussed experimental techniques using the taste, touch, sight, smell, and hearing of human 'subjects' The conference divided itself into two opposing points of view—the can ts,' who maintained that measurement of sensations was impossible and pointed out fallacies in experimental methods, and the "musts' who insisted that however philosophically unsound their techniques might be considered they served their purpose if they gave data of precise operational value

A topic which raised much discussion was the use of "trained observers,' who are intelligent people capable of understanding the nature of the observations required of them Such observers can give assessments readily and can report their readings with reliability Their observations can be shown to agree at selected points with those of a random selection of the general public Many speakers thought that this was a dangerous theory and there were quips from the "can ts, that the observers were trained to give the required answers The 'musts,' however, pointed out that if they had to employ, say 500 observers for every experiment, little or no progress would be made in the work

The conference was arranged as a private venture largely on the initiative of Mr R G Hopkinson, PH.D, (Building Research Station, D S.I R), and was designed to bring together workers from different fields who do not normally meet but who are concerned with subjective judgments The proceedings will not be published, but the main speakers have papers describing their techniques which may be available on request Further information may be had from Dr Hopkinson, Building Research Station, Bucknalls Lane, Garston, nr Watford, Herts

NEED

THE activities of the National Assistance Board are remarkable in their scope Its latest report[1] shows that at the end of last year no fewer than one in thirty of the total population were wholly or partly dependent on it for regular financial assistance four fifths of the recipients being old, infirm, or sick Supplementary allowances were paid to 90 000 of the 850 000 persons receiving sickness benefit under National Insurance at the end of the year, and a further 100 000 allowances were paid to sick persons not entitled to benefit 9000 unmarried mothers and 34,000 deserted or separated wives were supported or assisted and pocket-money at the rate of 5s weekly was paid to about 10 000 hospital patients without other resources During the year the board made 1,660,000 single payments to meet urgent but temporary requirements of the most varied kind and £363 000 was spent on exceptional need grants' mainly for clothing and bedding The board s officers did not confine themselves, however, to providing funds but were able to bring their influence and experience to bear upon innumerable domestic problems A landlord was prompted to repair a dilapidated kitchen, a gas meter was moved at the board s instigation to a position where it was more accessible to an elderly rheumatic lady, a solicitor was found willing to article a blind laws graduate, and Mr Sandy Macpherson was asked to play a request item for a couple of blind octogenarians These and many other similar episodes quoted in the report suggest that the board may frequently be able to cope with situations which baffle the general practitioner

1 Report of the National Assistance Board for the year ended Dec. 31 1949 Cmd 8030 H.M. Stationery Office Pp 68 1s 9d

STUDENTS IN ACTION

THE political bias of the International Union of Students has at last exhausted the patience of the British Medical Students' Association, which decided at its annual general meeting in Manchester last week to set up a non political international medical bureau open to all medical student bodies The executive of the B.M S.A was able to report on a very successful year, and to obtain the delegates' approval of the plans made, in conjunction with the National Union of Students, for the creation of a residential reablement centre for university workers and students with tuberculosis The meeting also discussed the compulsory house appointments, and asked that the "appointed day" be deferred until Oct 1, 1954, that the housemen should have at least 20 beds in teaching and 30 in non teaching hospitals, and that Colonial hospitals be recognised for the purpose of these posts, to enable Colonial students to complete their training in their own countries It was decided to appoint a permanent subcommittee on medical education, and to issue a handbook for medical students

Prof Geoffrey Jefferson, F.R.S, was invited to become honorary president for the coming year, and Mr Robin Coppock, of Cardiff, succeeded Dr Peter Diggory as student president

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University of Oxford

Dr Alice Stewart, acting director of the Institute of Social Medicine, is carrying on the duties of the professorship of social medicine during the Michaelmas term

University of Edinburgh

Prof Ian Aird is to deliver a Macarthur postgraduate lecture on Friday Dec 15 at 2 30 P M, in the surgery lecture theatre Professor Aird will speak on the Surgical Exposure of the Pancreas

Royal College of Surgeons of England

At a meeting of the council on Nov 9, with Sir Cecil Wakeley the president, in the chair, Mr W Kelsey Fry was admitted as a coöpted member of the council Mr K W Starr was elected and admitted as a member of the court of examiners for one year and Mr Ralph Marnham and Prof F A R Stammers were elected members of the court of examiners Prof John Kirk was elected an examiner in the forthcoming primary fellowship examination to be held in Cairo in January, 1951

The appointment of Dr Howard K Gray, of the Mayo Clinic, as a Moynihan lecturer was reported Prof Francis E Stock, of Hong Kong, was elected a Hunterian professor The re-election of Mr F Masina as Prophit student was reported The council received from Dr G M Vevers a gift of a cast of the Cheselden medal

Diplomas of membership were conferred on those whose names were published last week (p 546) as recipients of the L.R C.P

The following hospitals were recognised under paragraph 23 of the fellowship regulations

The Waikato Hospital Hamilton New Zealand Birmingham and Midland Ear and Throat Hospital junior registrar Royal Victoria Hospital Bournemouth 4 house surgeons all orthopædic house surgeons (for 6 months) Archway Group London registrar 2 junior registrars 3 house surgeons 1 orthopædic house surgeon E N T registrar Hackney Hospital London registrar 2 house surgeons (for 6 months).

Royal Faculty of Physicians and Surgeons of Glasgow

At the annual meeting of the faculty, on Nov 6, the following office bearers were elected for the ensuing year president Mr W W Galbraith, visitor, Mr Andrew Allison hon treasurer, Mr Matthew White, hon librarian Dr A L Goodall representative on the General Medical Council, Mr Andrew Allison

International Hæmophilia Society

This society is to hold an open meeting at 2 30 P M on Sunday, Nov 26, at 34, Eccleston Square, London, S W 1

Royal College of Physicians of Edinburgh

At a quarterly meeting of the college on Nov 7, with Sir David Henderson, the president, in the chair, the following were elected fellows I C Macdonald and R B McMillan. The following were elected members

B W Anderson, A A H Gailey S A Mannan Mir Mousiquddin, P R Mohan A W Lees W L H Jackson, S A K Karagulla E D Levittan J F McHarg, A B Da Costa, D L Murti Rao, R F Brooks, A A A El Sherif S E Large, R J C Southern, R D Young J B Clark N K Smith, M F G Buchanan J A McConachie R L Richards I S Collins, T L Henderson, N H Dalal

The Hill Pattison Struthers bursary was awarded to A F Bushby A presentation was made to Mr T H Graham, on his retirement after forty years' service as librarian

Royal College of Obstetricians and Gynæcologists

The following have been granted the diploma in obstetrics

G H I Anderson, W J R Anderson, Beryl G Bailey, R J Balfe, A W Banks W W Bardiger P J H Barron, Luise Beer, W G M Bell Stephen Blaxland S W Bowden, J R Bowker, R M. Boyce, Marjorie C Bremner, J H Brenner, A T Bromley Kathleen A S Brosnan, M L Bynoe Irene F Callender, K. A A Campbell, G A Carnachan M L Cattell, N P Chalifa Helen Li Chu Chang, David Charles, C R Cheadle, C C Clapham, Gwen S Clark, Helen A Clark, Jean Cockburn, Mary P Cole, R N O G Colley, M B Comerford J M. Crossley C A Cussen, C N D Arcy Sheila P Davidson, W M Davies, T R Davison, L K Dawson, Elizabeth A De Costres Mary Dixon D J Dooley, E R Dunn, W E B Edge Maurice Ellul R G Emerson Margaret T England, K A Exley Mary A Foley, Joan Ford, T A Frewin Kathleen M Frith Margaret Garnett, Marianne T Gaston, J M Gate B A Gavourin K K Ghosal Gladys M B Gill, N G Glen, Wendy E Greengross, Samuel Hamilton, J A R Hanna L M. Harrison, Geraldine Hector, Agnes B Johnstone G F Jolly, D A L Jones, Shireen Kazi Gwenyth H Kendrick, Sylvia Kershaw, Marjorie A C Kuck Margaret A Lakeman, Tamsin M. R Lee Margaret B Lees, Norman Lees, D G A Leggett, G A Lewis, J W Lewis, Lilias H Liston S E Lyle, Bernard Lytton Laurence McEntee, M B McEvedy Mary L Macfarlane, W J McKimmon, Ian Macpherson, J M S Manson D N Menzies John Meyrick M W Mills, R G Milne, Shafkat Munir, T J M Myles, S K. Nag P D Nathan Prakashvati Nayar, R G Nell Pushpa Nirula, A M. O Driscoll J J Owles, T C L Parry, S M. Phadke W R Plews Rosabelle J B Purves W L G Quinlivan, R J Rabett David Razzak N A Regan Frances M Richards Joan A Robertson Douglas Rossdale R K Rowntree M H Russell, T J Ryan M S Sanders, D E Sargent, Ramasamy Sathiah, Dawoud Scander J S Scott, G M. F Seelig S K Sharma, Esme J Simpson, P S Sinclair J A Smith Jean P Spalding, A. D Stewart Mary L Stokes, P K Storah J M Stuart, W H Tandy Joyce K Tate N A Thomas W M. Thomas, C H Thomson, J V Thurston, Rita D C Tozer J H S Wakelin Ellen Watkinson D J White, P P Wium, Wanda H Wodzinska G E Wolfe D J Woolford Ma Hnin Yi

Medical Practices Compensation

Claims for compensation for the loss of the right to sell the goodwill of practices should be submitted by the end of this year Claims submitted in the first two months of next year will be accepted only if the Minister of Health is satisfied that the delay was due to special circumstances No claim will be accepted after Feb 28

N A P T Prize

The National Association for the Prevention of Tuberculosis is offering a 100 guinea prize for an essay embodying the author s ideas and proposals for the improvement of the control of tuberculosis throughout Britain The competition is open to doctors of ten years standing who are working as tuberculosis officers, chest physicians, or sanatorium medical superintendents in the United Kingdom Further details can be had from the secretary general, N A P T, Tavistock House North, Tavistock Square, London, W C 1, to whom essays should be sent by March 1

Conference of Assistant Nurses

At the third winter conference of the National Association of State Enrolled Assistant Nurses, held in London on Nov 8, criticisms were expressed at the continued use of the term "assistant" Mr A Blenkinsop, parliamentary secretary to the Ministry of Health, said that the percentage of passes in the 195 assistant-nurse training schools with their 2000 students was high Definition of the status and scope of State enrolled assistant nurses is one of the matters which the association is taking up with the Ministry The association is also anxious that S.E.A.N s should have opportunity for promotion and it has protested against the General Nursing Council's recommendation that S.E.A.N s should be senior to student nurses only until the latter have passed their preliminary examination, which many S.E.A.N s have them selves passed Dr C H C Toussaint spoke to the conference on the domiciliary management of tuberculosis cases At the conference dinner, Dr Marjory Warren, president of the association was in the chair

Society of Apothecaries of London

A course of ten postgraduate lectures on modern methods of diagnosis and treatment is to be held on Dec 4–8

Art Therapy in Clinics and Hospitals

A conference of art therapists in clinics and hospitals will be held on Dec 2, at 2 P M, at 39, Queen Anne Street, London, W 1 It will be mainly concerned with plans for future coöperation, and training standards The size of the meeting is limited to 50, and applications should be sent to the conference secretary at 39, Queen Anne Street

More Hospital Beds

In the two years from July, 1948, to the end of last June the number of staffed hospital beds in England and Wales increased by nearly 15,000 Of a total of about 514,000 beds, 470,000 were staffed at the end of this period This is announced by the Ministry of Health, which states that hospital nursing and midwifery staff has increased by 24,000 (16,000 full time, 8000 part-time) to a total of nearly 160,000 (135,000 full time 25,000 part-time) Increases have taken place among all grades, including student nurses, midwives, and pupil midwives There are now 7000 more student nurses, the total being 49,000, this is a new record

British Medical Association

The association is offering the following scholarships for "research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease" Ernest Hart scholarship (£200), Walter Dixon scholarship (£200), and four other scholarships (each of £150) In addition, the Insole scholarship (£250) is offered for research into the cause and cure of venereal disease

Each scholarship is tenable for one year from Oct 1 1951, a scholar may be reappointed for not more than two additional terms Scholars may be members of the Armed Forces or may hold a junior appointment at a university, medical school, or hospital provided that this does not interfere with the research. Applications should be submitted by March 31 1951 to the secretary of the association, B.M.A. House Tavistock Square, London W C 1

Appointments

BATES T J N M B Dubl, D P M non resident psychiatrist, Winwick Hospital Lancs

BREARLEY, B F M.A, M B Camb M R C P consultant general physician, Preston Royal Infirmary Sharoe Green Hospital and Chorley hospitals

COLLINS M J, M B N U I D P H joint M O and asst county M O, Hucknall Notts

CRESSWELL, G D M B Glasg appointed factory doctor, Rugby district

CUBIE, G M. M B Glasg D P H M O H, divisional school M O and area executive M O Wallsend

CULBERT T D M B Edin D A senior consultant anæsthetist Manchester babies and children's hospitals group with duties in Manchester Northern hospital group

HILL I M. M B M.S Lond., F.R C S asst thoracic surgeon, St Bartholomew's Hospital London

HUTCHISON, ALEXANDER M D Glasg, F R F I S, D P H M O H and school M O Bolton Lancs

KENDALL A C M B Birm M R C P D C H pædiatrician Coventry group of hospitals

LORANT STEPHEN M D Budapest consultant group pathologist at Rochdale Infirmary and Birch Hill Hospital Lancs

MACDONALD G A M B Glasg D.M R D radiologist, Coventry group of hospitals

MATHERS J R, M B St And, D P M deputy medical superin tendent Hollymoor Hospital Birmingham

ROBINSON MARGARET M D Belf, D P H asst M O Derby

ROBSON T W M B Edin D P H M O H and school M O Dewsbury

SCOTT D G M B Glasg D P.H. D OBST asst. county M O.H, Warwickshire

SHAW, C H M D Lond, D P H deputy M O H, deputy school M O and deputy port M O Ipswich

TIMOTHY, J I M B Lond D P.M. asst psychiatrist Cefn-Coed Hospital Swansea

TURNER A F M B Belf D P H deputy county M O H Dorset.

TYSON W J B M Oxfd, D T M & H D A anæsthetist, West Bromwich and Walsall groups of hospitals

WHITTICK J W M B Edin director pathology department Royal Cancer Hospital London

Hospital for Sick Children Great Ormond Street London

CADE IRENE, M B Lond house-surgeon (junior registrar grade)

CLARKE J A, M B junior resident anæsthetic registrar

SUTCLIFFE JOHN M B Camb M R C P asst radiologist

TRYTHALL, D A H, M D Lond M R C I house physician (junior registrar grade)

Local Treasury Medical Officers

ARGO, J K M.R.C.S Inverurie and Kintore, Aberdeenshire

DOWNES E A L.R.C.P E. Southampton West area

GILBERTSON H M. M R C.S Stevenage Herts

HAMBLY TREVAN M R C.S Ryde I.O W

MASON R W T M B Manc Carnforth Lancs

PRITCHARD WYNNE M B Lpool Blaenau Festiniog Merioneth

SMITH A S L.R.C P E Whitehaven Cumberland

STUDY OF DELINQUENCY *

D H STOTT
M.A. Camb, Ph.D Lond.

I SHALL take as my theme What contribution has contemporary psychology to make to the prevention of delinquency and the cure of delinquents ?

It is well to review first how much the psychologist and the knowledge at his disposal is used As regards prevention the answer is quite simply Hardly at all Neither the public nor the State have yet begun seriously to deal with the child in his pre delinquent phases Public concern is limited to punishing him when he dares to force his unhappiness upon us

Quite unnecessarily we allow unhappy children to remain unhappy, either because we are insensitive to the signs, or regard them as mere naughtiness or as just part of a child's nature At present the school-teacher, for instance, who is in the best possible position to spot the unhappy child and potential delinquent, receives no training in how to do so

Quite unnecessarily also we allow children to remain, year in year out, in human situations so deleterious that their only defence against insanity is to eschew all sentiment and all affection, and to develop that lack of finer feeling and loyalty which is misnamed "moral defect" When such types become delinquent society is up against a tough problem

What is worse, through ignorance and our own insensitivity we are manufacturing criminals, *putting* children in situations where there is a reasonable prospect of their developing into immoral types Our knowledge about how criminals are made has only been available in recent years, and for the most part has not yet got through to the administrator, the social worker, the magistrate or the legislator For example, in allowing the parent to bring his child to court as "beyond control" we provide the machinery for the child's being rejected, and lend substance to the anxiety-creating threat of "putting away"

SHORTCOMINGS OF THE ADMINISTRATOR

My observation of the large number of adolescent delinquents who had passed their childhoods in institutions has made me spend some time recently in examining what happens to them there.[1] I found that, for administrative convenience, it is quite a general practice for parentless children to be raised in a residential nursery until they are three, and in a toddler's home until five, at which age they are transferred to a home for children of school age The five year-old, in so far as it has had mother figures at all, has had at least three different ones It has been taught by bitter experience never to attach itself deeply to anyone This is what the matron of a toddlers' home said to me

> "Nursery children are altogether different from other children, they are always on the defensive they never give, they take It is a long time before they will play properly with other children, they are more self-contained. It takes a long time to get underneath a nursery child they don t trust you.'

I have heard a very sincere Children's Officer suggest that a difficult child should be placed with a good foster-mother, for *a few* months only until he settled down, and then be removed from her—as if his difficult behaviour was merely a question of getting him accustomed to a regular daily routine Again, it is current practice, owing to the shortage of space in Children's Homes and owing to legalistic ideas as to the parent's primary responsibility irrespective of the good of the child, to try to force unsuitable and unwilling mothers to have their children back again

Let me quote no very extraordinary example of a problem which all housing authorities have to face. It is of a family of bad rentpayers who had been twice evicted, and refused further council accommodation on that account Man, wife, and four children were forced to live in one small room which had been allowed them by a charitable acquaintance No attempt to rehabilitate the family was made Authority took the view that it was their fault, they were made to stew in their own juice, and the result was that one of these children and two others of the family who were forced to live elsewhere became delinquent

SHORTCOMINGS OF THE PSYCHOLOGIST

I do not want to lay the blame for the manufacturing of criminals upon our public administrators They have no doctrine to work upon, and so the good and the evil that they do is a matter of chance—the chance that any particular officer is a humanly feeling person in a human mood, who is not overwhelmed by other administrative pressures It is rather the fault of the psychologist that he has not yet properly expounded or popularised recent knowledge about the effect of the human environment upon character, nor have we embodied it in a procedure which the administrator and social practitioner can utilise We must evolve procedures which are just as much an inescapable routine as a medical examination, and which would make the failure to consider the emotional situation of a child just as reprehensible a dereliction of duty as subjecting a child to physical hardship I shall therefore lay my chief emphasis upon this subject of procedures for studying human beings and human relations

In the main, these techniques are not yet in existence The traditional psychiatric examination, at the best discovers nothing that the most ordinary inquiry into the behaviour of the patient would not reveal, and at the worst is the subject of justifiable ridicule by those who have to read, and are expected to act, upon its findings I have in mind a case where a Children's Department is nonplussed by the report of two clinicians upon a boy, one of whom described him, correctly, as highly disturbed, the other as perfectly normal The point about a consulting room interview is that whereas it *might* be revealing, there is no guarantee that it will be so The child is seen in only one mood, and in only one situation Nor do I believe that any projection-technique, however valuable for giving hints as to essential attitudes, can ever be a substitute for the direct study of actual behaviour And the more remote any specimen, consulting-room behaviour is from the usual range of a person's activities, the bigger the chance that it will be unrepresentative, and the greater the need to prove that the test means what it is meant to mean The procedure of direct observation has these drawbacks to a greatly lesser degree as I hope to show later it is easier to interpret behaviour in real life than in artificial situations

Since therefore, it is likely that a lot of work will be done in the next few years on techniques of observation, and, as I hear, similar work is being started in America, I should like to say something about the principles governing such techniques

CHARACTER TRAIT OR SITUATION-ATTITUDE ?

The first thing to be clearly recognised is that the concept of the character trait does not correspond with reality The old schedules asked the observer to state whether a child was "coöperative or uncoöperative," "cheerful or depressed," "lazy or hardworking," as if

* An address to the British Psychological Society on July 8.

1 Stott D H Delinquency and Human Nature Obtainable from the Carnegie United Kingdom Trust Dunfermline Fife 5s or $1 post free

he was one or the other of such alternatives at all times to all people In the course of my study of boys in approved schools I did draw up such a schedule of traits so that I could discuss each boy with his housemaster and instructors I was astonished to find what different opinions were forthcoming To one man a boy was endowed with all the virtues, to another with all the vices This was not in the main due to the well known halo phenomenon of personal judgments—the tendency to paint people we like white and those we dislike black, these lads did behave differently to different people, they did act as the saints or the sinners that they were painted

In the end I had to scrap the whole schedule of trait assessments, instead I began to study variations in behaviour according to the type of situation "A," I noticed, was a delightful personality so long as he did not have to obey an order "B" was a fine craftsman, except that when in a bad mood he could not make the simplest measurement One might say in general that *the response varied according as any given situation did or did not offer the prospect of satisfying a basic psychic need* And the quality of the reaction depends upon the expectation of fulfilment which the person has come to have as a result of his experience of previous, somewhat similar situations This may sound rather theoretical, but rather more simply, one might say that people develop habits of reaction, or attitudes to situations of a certain type People with largely unhappy human experiences tend to assume that everyone will betray, cheat, desert or rebuff them—hence a pervasive attitude of misanthropy which looks like a trait of character But some of my boys would mistrust women more than men, and vice versa, some would mistrust all adults but display a desperate loyalty to their fellows These complications can be embraced by the concept of the situation-attitude but not by that of the trait, the bankruptcy of the latter concept, incidentally, being no better seen than in Allport's refinements which postulate the capacity of traits to die, to be born again, to metamorphose themselves or to come into activity or not for reasons of their own—the which acts as a warning not in our turn to elevate the situation attitude into a kind of little internal bogy man It is merely a conative habit, and, I believe, obeys the laws of habits

This view of the situation attitude as a habit has important bearings, which I shall mention later, upon treatment Also, if one has studied the way a person tends to act in various types of situation, one is in a position to help him choose those situations which bring out the better side of his nature, or advise those who have the care of him in arranging for his future, shall we say, upon his licence from an approved school And when it is realised how much a person's emotional health depends on the situations he meets, one sees how dangerous it is to make a prognosis in the abstract This type of prognosis, which incidentally often does tremendous harm by discouraging people from persevering with a disturbed child, is seen, like most of the current notions about so called mental disease, as a concept recklessly borrowed from physical medicine

For observational purposes I think the best way of preventing the concept of the situation attitude from developing into another mystical and ultimate thing in itself is to regard it merely as the summation of a number of bits of behaviour—bits of behaviour, however, which are classified according to a theory, that is to say, which have been selected in the light of what we know about the general potentiality for feeling and reacting that human beings possess It is a question, then, of collecting the samples of behaviour which will enable us to make these inferences of situation attitude The blind recording of behaviour, it cannot be too plainly stated, without any theory as a guide to significance, is likely to result in triviality and to be of little use for diagnostic purposes

By way of illustrating what I mean by this inference of situation attitude, or in other words the interpretation of behaviour, may I take the case of a five year old institution reared girl who was described by the staff as "aggressive"—a beloved word of child welfare people which can mean practically anything This is how the house mother described her tempers "She will go up into the bathroom and throw things out of the door one by one, slamming the door in between each article and saying 'I don't like nobody here' She is better than she was She used to say, 'I don't like nobody in this home I only like myself'" The aggressiveness, thus seen in terms of actual events, reveals itself as an attitude of violent rejection When I inquired about the same child's reaction to endearments the house mother said "She likes to be kissed when she goes to bed You can't kiss her at any odd time She wouldn't *come* for a kiss or a hug, but when in a *good mood* she will make no objection, in a bad mood she will shake herself free" One sees another aspect of the rejection and affection shyness How pervasive this attitude was becoming, even in a child of five, is revealed in what would once have been described as a trait of contrariness and obstinacy She would not only reject affection in itself, but the kindly ministrations of adults in all forms "At one time—to quote the house mother again—if we were to ask her if she liked a certain thing, she would say 'No' as a matter of policy" Although a child of good appetite, she made a gesture of pushing away food, saying "Take it away, I hate that stuff" And (quoting again) "Sometimes you will find her stark naked by her bed saying 'I don't know what to put on' and tossing her clothes about If we say 'Put your vest on,' she replies 'I don't know what my vest is'"

My point, in summary, is that these samples of behaviour tend to interpret each other Viewed together, they enable the clinician not only to diagnose an attitude, but to estimate its strength, its consistency, and the degree of its spread or projection over a range of situations—to what extent, in short, it becomes a dominant pattern of reaction And above all, the clinician has an objective measure of the child's progress Much of the behaviour just quoted belonged to the first few months of the child's stay in the institution The fact that the gestures of rejection were gradually being discontinued meant that she was learning to accept the affection of the house mother and her staff, in other words the treatment was being successful

A GUIDE TO OBSERVATION

It is now time to refer to the "Guide to Child Observation" which I have prepared Its full title is "Guide to Child Observation (Children in Institutions, 5–15 years)" and the following is an extract, taken from the part of the section "Attitudes to Staff" which is most relevant to the behaviour of the five year old girl quoted above

Affection—Accepts and gives affection freely/always "*coming for love*"/demonstrative ("all over" people)/pretends indifference or independence/refuses affection avoids any intimacy

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This guide was evolved from a series of discussions which I held with house mothers and house fathers and their assistants—taking 20 children, spending an afternoon on each, and making notes upon the kind of things each child did, upon the way it behaved to the staff

and to other children, how it played games, treated its possessions, and so on The schedule gradually took on its present shape as a result of successive draftings, but it has yet to be seen how the staff of a home can use it independently You will notice that general "blanket" descriptions are avoided as far as possible Phrases like "Tempers, bullying, nervousness" are used by people to describe astonishingly different kinds of behaviour Tempers may refer to explosive inferiority-reactions, or to gestures of rejection, bullying can be more domineering and assertiveness, or a real desire to hurt, nervousness a tendency to compulsive movements, or high fears While avoiding these popular clichés the schedule must be framed in language that the non technician can follow, it is a question of selecting such expressions as will conjure up the image of a child *actually behaving in a certain way*

It may be thought that for the use of institution staff this schedule is too complicated But a picture of a personality, to be of value, must be a comprehensive one And if all these queries are not laid out in black and white, the clinician would have to waste time and energy to putting them all by word of mouth, with the additional risk of leaving something out and so of not eliciting certain crucial facts Also, once a member of a staff gets used to the schedule, he or she should be able to run through it quickly in respect of a particular child Most important of all, familiarity with a guide such as this acts as a training in observation On many occasions a house mother or house father has said, even as regards nail biting "He may do, I couldn't be sure I must watch him"

For each category of person and situation separate guides would have to be drawn up by the study of sample groups. For instance it would be of tremendous interest to have one for children up to three years old We would want another for children of five to fifteen living in their own homes (such, in a rough and ready way, as I developed for the systematisation of the home information in my study of boys in approved schools), and yet others for the study of parents and prospective foster parents

Only by taking separate schedules for each category of person can one go into the kind of detail that will begin to yield really significant results For example, my factors[2] J 3 and J 4, "Father or Mother lacking in, or inconsistent in, Affection" are obviously inadequate to embrace all the inconsistencies, conflicts of attitude, guilty displays of over affection, insincere mouthings of fondness, deep affection which cannot express itself, and so on, that one finds in real live parents My difficulty was, of course, to keep the whole life history of the boy, his present array of situation attitudes, and the characters of his parents within manageable proportions in one statistical summary The original sheets actually had 256 factors, or over half as many again Nevertheless, despite its inadequacy, it occurred to me that other clinicians might like to work on a similar schedule, both with delinquent and non delinquent cases It would also be extremely interesting to see to what extent a random sample of ordinary youths tend to conform to the same reaction patterns or, alternatively, fail to score Consequently I have had a number of blanks prepared, which I shall be pleased to supply to anyone who thinks of doing similar experimental work

DATA FOR STATISTICAL ANALYSIS

I have so far stressed the practical need for these systematised observations—their use, that is to say, for diagnosis and for counsel Their theoretical utility must be even plainer Some acts and utterances lend themselves to easy interpretation, as instance the so called aggressiveness of the five year old girl which I took as an example But the inner or unconscious purpose of some behaviour is not at all obvious Is bedwetting a symptom of a general anxiety, as sometimes assumed, or is it associated with a particular kind of unsatisfactory mother relationship? Is a lack of care for his appearance in a boy more often associated with nervous exhaustion, an indifference for the regard of others, a mood of going to the dogs, or an unconscious desire to annoy his parents? These questions can only be answered by the application of statistical techniques—which means that the variables must be defined with a reasonable objectivity Once we can reduce our study of personality to quantitative terms, we should be able, if we can keep the mastery of our statistical steed, to advance to new certainties about human nature

THE PSYCHOLOGIST'S TASK

Perhaps it is time I returned to my subject To summarise the psychologist's rôle in the prevention of delinquency, it is to provide a routine for deciding what a child is like, and what kind of things he may be expected to do next, further, to sharpen the observation of those who have to do with children, so that the unhappy ones, the potential delinquents, can be spotted at an early stage, and finally to make the public, and parents in particular, and our administrators more particularly still, sensitive to the emotional needs of children

The other side of the psychologist's work is the treatment, both of the pre delinquent and of the already delinquent Here our record is anything but a bright one, and it will not be letting the side down to be frank about the present state of things It is better that criticism should be voiced by psychologists among psychologists, than by those who doubt the value of psychology And whether it be Sir Leo Page[3] or I who draws attention to our weaknesses, it matters little, because all those who use our existing psychological services are only too well aware of them

Just a week or two back a club leader told me how he had for some two years been taking a personal interest in an artistically gifted club member of his, who was very unsettled The probation officer advised him to seek the advice of a well known clinic After a single interview with the lad the clinician refused to see him again it was too bad a case! In another case recently reported to me, the clinician, a supposed specialist in delinquency, rejected a delinquent boy, again after one interview, because he was uncooperative These instances reveal a fundamentally wrong view of treatment One cannot expect every young delinquent to lie on a couch and spew up his innermost thoughts We must recognise the fact that some delinquents are awkward people Imagine what would be said of a family doctor who refused to treat a patient because he did not respond to his one and only prescription A refusal to treat, or a picking and choosing of our patients, will only damage our reputation among the magistrates, the club leaders, or school teachers who are enlightened and humanitarian enough to refer a child for psychological advice

Our essential error is that treatment is too clinic centred there is a danger of developing a cult around the mystic belief that by some process of turning the patient emotionally inside out he will receive an inner cleaning—a process which, apart from its very dubious value, needs so many scores or even hundreds of interviews as to be quite irrelevant for our present delinquency problem There is of course a place for the giving of insight by some outsider who stands apart from the world with which the lad has embroiled himself It was

2 In the statistical summary attached to Delinquency and Human Nature (ref. 1)

3 Page L The Young Lag London 1950 See *Lancet*, 1950, i 1080

he was one or the other of such alternatives at all times to all people In the course of my study of boys in approved schools I did draw up such a schedule of traits so that I could discuss each boy with his housemaster and instructors I was astonished to find what different opinions were forthcoming . To one man a boy was endowed with all the virtues, to another with all the vices This was not in the main due to the well known halo phenomenon of personal judgments—the tendency to paint people we like white and those we dislike black , these lads did behave differently to different people, they did act as the saints or the sinners that they were painted

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SUPPURATIVE PNEUMONIA *

HOWARD NICHOLSON
M.D Lond , F.R C.P
ASSISTANT PHYSICIAN, UNIVERSITY COLLEGE HOSPITAL, CHIEF MEDICAL ASSISTANT, BROMPTON HOSPITAL, LONDON

With illustrations on plate

(Concluded from p 554)

Non-specific Suppurative Pneumonia

In this lecture I wish to give an account of chronic non specific suppurative pneumonia In describing the development of non specific suppurative pneumonia I have put forward the view that there is a whole range of aspiration pneumonias of varying severity in which suppuration occurs One type when first observed presents as a solitary abscess cavity with little surrounding pneumonia , another as a predominantly pneumonic process in which large or small abscesses may develop The importance of recognising the type which begins as a solitary abscess is that as long as it remains solitary and is not complicated by surrounding suppurative changes in the lung, it may sometimes be treated successfully by surgical drainage Once it has become complicated and the disease consists no longer of a solitary abscess, then its progression cannot be distinguished clinically from that of the type which is mainly pneumonic from the beginning What is more, their prognosis and treatment are the same, and I do not believe that it is useful to attempt their separation

To this chronic phase of pulmonary suppuration many names have been applied—among others, aputrid abscess, necrosuppurative pneumonia, and spreading suppurative pneumonitis It may simply and correctly be called chronic lung abscess , but this has the disadvantage that not all cases which may legitimately be included in the group have begun as abscesses, and in some cases abscesses may never have been recognised clinically or radiologically at any time This, I am sure, leads in practice to confusion of thought rather than clarity, because when such cases are seen the observer frequently fails to regard them as examples of pulmonary suppuration , and he tends to place them in, and to think of them as, some quite separate disease entity, not amenable to the same lines of treatment

Because of this, I think the term chronic non specific suppurative pneumonia is a useful one The condition as it presents itself to the physician is characterised by the long standing production of purulent sputum which has a mixed and often varying flora , and in the lungs areas of pneumonic consolidation are found, often associated with abscess cavities In fact, the name is simply a description of the disease as seen , and, as long as the user is clear that it is a comprehensive term and in no way separate from chronic lung abscess, it is a satisfactory one in practice

INCIDENCE

Some idea of the incidence of chronic non specific suppurative pneumonia may be gathered from the numbers treated as inpatients at the Brompton Hospital In 1946 there were 23 out of a total of nearly 1400 inpatients It is perhaps easier to appreciate that 23 cases is quite an important group when it is made clear that the total number of non tuberculous cases treated in the same year was approximately 600 For the years 1947 and 1948 similar figures obtain , approximately 1 in 30 of patients in this hospital suffering from non tuberculous disease have chronic pulmonary suppuration of this type

The sex distribution shows a considerable preponderance of males over females The number of patients of both sexes treated in the Brompton Hospital in three years is given in table I, which also shows the patients' age distribution The disease is seen at all ages throughout adult life , but there is, in this group at any rate, a somewhat larger incidence in the fifth decade of life

From this group of 57 cases, I selected 28 in which the course of the disease had been followed long enough to make possible a study of the clinical features of the disease I propose also to compare certain of the clinical data of these 28 cases with those of a further 25 under the care of Mr Andrew Logan and myself in a military thoracic unit in the Middle East in 1941–45 (Logan and Nicholson 1949)

TABLE I —SEX DISTRIBUTION AND AGE INCIDENCE OF CHRONIC NON-SPECIFIC SUPPURATIVE PNEUMONIA AT THE BROMPTON HOSPITAL DURING 1946–48

Sex-distribution

Year	No of cases	
	Men	Women
1946	18	5
1947	10	3
1948	16	5

Age incidence

—	Age (years)				
	20–30	30–40	40–50	50–60	60–
No of patients	10	12	22	8	5

ÆTIOLOGY

In 19 of the 28 cases treated in the Brompton Hospital, it was possible to find a cause for the pulmonary suppuration

Factors	*No of cases*
Dental sepsis	7
Extraction of teeth	2
Operation under general anæsthesia	2
Chronic bronchitis	5
Others	3
None found	9
	28

Of the 7 patients with dental sepsis, 5 had gingivitis and 2 necrotic stumps Of the 2 patients with a history of operation under general anæsthesia before the onset, 1 had been operated on for perforated gastric ulcer and the other had undergone thyroidectomy , in each case the patient had dental sepsis In 1 patient the pulmonary suppuration followed the giving of thiopentone for a psychological investigation , in another it followed prolonged sea bathing , and in a third, who came from Poland after the war, it was perhaps related to poor nutrition There was also a group of 5 cases in which the suppuration followed long standing bronchitis in which there was cough and the expectoration of small amounts of mucoid sputum In the remaining 9 cases no ætiological factor was found

ONSET

The great majority of the patients seen at the Brompton Hospital were not sent there until the disease had been present for some time, and it was seldom possible to get any clear idea of the mode of onset All the Middle East group were in some form of military service and were accordingly sent to hospital early in the illness Of the total of 25, all except 3 had radiographs taken early enough to demonstrate the original distribution of the lesions In 5 of these patients the radiographs showed a cavity within three weeks of the onset , and in these patients the illness began acutely with cough, profuse

* The Goulstonian lectures for 1950 delivered at the Royal College of Physicians on Jan 10 and 12

suggested above that bad human attitudes are by their nature habits of reaction, and the cure of a bad habit depends upon two things, insight into the habit and the wish to be cured But the delinquent's bad attitudes are false attempts at adjustment, his way of mitigating his inner distress He fears to face life and emotion in a normal way, because the pain of renewed failure would be more than he can bear And so he clings to his antagonisms, his immorality, his cynicism and his attention filling diversions Mere reason or mere insight will not avail against the bitterness of his life experiences

The first task of the psychotherapist is to give him a new confidence in human relationships Good human experiences must be provided which will counteract the previous bad ones Of course the patient will resist, and distrust and test to the uttermost the sincerity of the friendship which is offered him If furthermore it is offered carelessly, with too many blandishments, he will flee from it like a terrified animal The drawing of a deeply withdrawn person into a fellowship group must be a carefully supervised process, and carried out by people who are aware of what they are doing It is the psychologist's job to direct this process of recall to normal human feeling Without this every other device of therapy is useless No one would think of trying to revive a drowning man with his face still in the water

It is apparent, also, that this approach to treatment pre supposes an accurate diagnostic technique, not only to gauge the depth of the delinquent's false adjustment, but for the appraisal of his contemporary human situation For example the therapist will have to judge whether his family life can be improved by the sympathetic intervention of an outsider, or whether it is emotionally so impossible that the patient must be transferred to an entirely new human environment In any case, it is a question of tactics—a mutual improving of people's attitudes to each other, the removing of the barriers of pride which uphold antagonisms, the giving of insight and education in human relations in doses that can be absorbed This is quite another thing from the mechanical weekly clinical interview which is sometimes called treatment None of the clinicians to whom I have known approved school boys referred have ever asked for consultations with the staff as to the boys' person attitudes, nor, astonishingly enough, have they thought of seeking information as to their family situation The treatment was an isolated weekly occurrence, to be weighed against the occurrences of every other hour of the week which the clinician ignored The influence of that one hour, in terms of happy human experience, is of particularly little consequence with the type of delinquent who has a knack of creating bad situations against himself

A NEW TYPE OF SOCIAL PRACTITIONER ?

There is a further consideration regarding our psychological services the kind of treatment which our new emphasis upon human relations involves makes one wonder if the present division of labour between psychiatric social worker, educational psychologist, and psychiatrist is a fruitful one Can a written or even a verbal report of any reasonable length communicate from the one to the other the detailed evidence of what is wrong with a human situation ? At any rate, to be adequate it must involve an enormous amount of time and drudgery, and a second hand report lacks the vividness of personal and sometimes incommunicable experience I feel that a new type of social practitioner must be developed, with the individual responsibility for a case like that of the general medical practitioner, who sees what is wrong and acts upon it himself

One of the defects of our present clinical service is that there is no responsibility for success or failure No one seems to mind if the treatment fails, perhaps no one expects it to succeed It is well for us that no modern Molière is at hand The present tendency to flee competition and the test of results is a neurotic one If the medical practitioner is not afraid to let his reputation hang upon his devotion to his work and upon his successes, why should not his brother the psycho therapist accept a similar challenge ?

Finally, it is apparent that case investigation of the type outlined is patient, time consuming work, to be carried out by specially trained people The evidence of emotional ill health is perhaps more elusive than that of physical disease, and so the investigation and treatment of each case will on the average be more expensive Can society afford it ? Let us review the debit and credit items on the balance sheet On the one side there may be, say, a whole month of a professional person's time, on the other the expense of a whole delinquent, neurotic, or psychotic lifetime on public charge Say £60 against many thousands It seems a fairly safe investment In physical medicine no one queries the necessary expense of a long case, we recognise, at least in principle, that physical suffering and human life are above mere financial considerations Why should we then begrudge the expense when a lifetime's happiness, and perhaps the happiness of succeeding generations, is at stake ? But before we press these points we must convince the public that the psychologist can deliver the goods It is no use, for example, asking the school to spot the unsettled child at an early stage unless there exist the competent family advisers to deal with the case effectively

CONCLUSION

It may be felt that I have not spoken as specifically about the study of delinquency as I might have done But persistent delinquency in its irrational, undeterrable, breakdown stage can be defined as a neurosis of a type which gives some point to lawbreaking Essentially the same types of reaction are, I believe, to be found in not formally delinquent neurosis The study of the one is largely the study of the other, and the same exact methods of observation are needed for both

To many psychologists my remarks will sound too sweeping What can happen in one clinic would be impossible in another It is no new doctrine, in the progressive clinic, that therapy must be directed not only upon the difficult child but upon his family And I am but one of a number of psychologists who are trying to think things out afresh in terms of human relations It is owing to the youth of our science that it still suffers from ideas and methods which have been borrowed from physical medicine In dragging the inadequacies of our old fashioned brethren into the limelight my intention has been mainly to show to what extent this new approach requires an overhauling of psychological practice and different types of professional training

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" Benefits in the form of a service have this further characteristic that the rights of the citizen cannot be precisely defined The qualitative element is too great A modicum of legally enforceable rights may be granted, but what matters to the citizen is the superstructure of legitimate expectations It may be fairly easy to enable every child below a certain age to spend the required number of hours in school It is much harder to satisfy the legitimate expectation that the education should be given by trained teachers in classes of moderate size It may be possible for every citizen who wishes it to be registered with a doctor It is much harder to ensure that his ailments will be properly cared for And so we find that legislation, instead of being the decisive step that puts policy into immediate effect acquires more and more the character of a declaration of policy that it is hoped to put into effect some day "—Prof T H MARSHALL, Citizenship & Social Class Cambridge, 1950, p 58

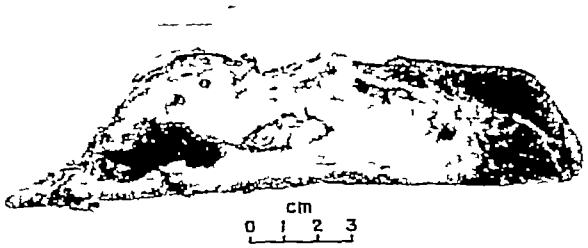


Fig 22—Photograph of cut surface of left upper lobe showing extensive consolidation and cavitation

this extension was not hindered by the interlobar septa Besides this method of spread, there were a number of instances—7 in each of the series I have studied—where spread occurred to parts of the same lobe or lung which were not contiguous In these circumstances it is, I think, reasonable to assume that the spread took place by aspiration of material from the affected part of the lung into the bronchi of fresh segments In addition, there was 1 example in the military hospital group, and 2 in the Brompton Hospital series, of spread to the other side

Cavitation may take place at any stage of the disease, it may develop early or late in the original lesion, and may sometimes disappear The freshly invaded parts frequently cavitate, and it is not uncommon to have multiple cavities of varying size in the same lobe or lung In the series studied the radiological appearance often remained stationary for two to three months, and this was commonly associated with clinical improvement. Sooner or later there was usually recrudescence of the symptoms, associated with radiological evidence of further spread of the disease

In most cases there was at some time evidence of at any rate partial clearing of the pneumonic process Where this happened, the lung showed radiological evidence of fibrosis In the military hospital group there were 2, and in the Brompton Hospital series 7, cases in which the radiographs, after recurrent episodes of consolidation and cavitation, showed only evidence of fibrosis and distortion of the lung This is a stage to which the term "burnt-out" is sometimes applied, the implication being that the danger is over I am sure that this is not so, it is not uncommon to see the disease light up again in these cases with recrudescence of the inflammatory process in the fibrotic area and spread to previously unaffected parts When bronchograms are done in this stage of fibrosis they show distortion of the bronchial tree and bronchiectasis, which may be of any type Bronchograms are of no value in the active phases of the disease because the iodised oil rarely enters the affected parts of the lung, the associated bronchi being then occluded by pus and pulmonary debris Such importance as they have is in relation to the more quiet phases of the condition when the pulmonary changes are principally those of fibrosis, and then their main use is in deciding on treatment I shall, therefore, refer to bronchography again when I come to treatment

Fig 23—Photomicrograph of part of wall of central cavity of specimen shown in fig 22; its partial covering of epithelium can be seen

EMPYEMA

In one of the military hospital cases, and also in one of the Brompton Hospital group, empyema developed In both instances this happened quite late in the course of the disease—namely, one year and four years after the onset of the pulmonary suppuration In both these cases the empyema occurred in a part of the pleural cavity remote from the original site of the disease The development of the empyema was related to the spread of infection to a fresh area of the lung, where presumably the pleural layers had not previously been inflamed and were not adherent In one there was a bronchial fistula into the empyema, but in the other no fistula was evident Both cases were treated by drainage and they healed, the progress of the pulmonary suppuration was not affected.

Fig 24—Photomicrograph of part of consolidated lung shown in fig 22. Fibrous tissue, collections of inflammatory cells and alveolar areas lined with cubical cells can be seen In upper part of photograph two groups of lipoid filled macrophages are shown

PATHOLOGICAL CHANGES

In 12 of the military hospital cases and in 13 of those treated at the Brompton Hospital, the diseased lung tissue was examined either post mortem or after its surgical resection The naked eye and microscopic features were the same in all cases, and were the same as those described in chronic lung abscess The pleura covering the affected lung was thick and widely adherent to the wall of the thoracic cavity The interlobar fissures were obliterated The lung itself was mostly airless, but there were areas of emphysema. Abscess cavities of various sizes, often multiple, were seen in most of the specimens Not uncommonly the cavities apparently extended across segmental boundaries In some specimens dilated and distorted bronchi ringed with fibrous tissue were visible

On histological examination the tissue showed a variety of appearances The cavities were lined with granulation tissue, showing more or less advanced fibrosis and infiltration with plasma cells and lymphocytes In some there was a partial lining of columnar or squamous epithelium The alveoli surrounding these abscess cavities were filled with exudate, which in some places was undergoing organisation and fibrosis Groups of alveoli lined with cubical cells were seen, and there were

sputum, and pain in the chest—the onset typical of an acute solitary lung abscess There were 10 further cases in which the onset was acute with similar symptoms, but in which the lesion seemed to be pulmonary consolidation, and cavitation was not seen in the first three weeks In the remaining 7 cases the onset was more gradual, consisting usually of cough and increasing fever, and evidence of pulmonary consolidation was found radiologically

In all cases there was an initial febrile period which did not usually persist for more than a few weeks Purulent sputum was coughed up from the onset in all cases in this group except 1, in which for the first four months only traces of mucopus were expectorated In 13 instances in this group the sputum was described as offensive or fœtid at the onset

CLINICAL COURSE

Clinically, the progress of the disease was similar in the two groups of cases The fever at the onset settled, but was followed by repeated febrile periods, lasting usually a week or two, and often associated with a reduction in sputum, in these episodes the temperature would reach 101°F or, rather infrequently, higher levels Then, often after sudden expectoration of profuse sputum, or more gradual increase in its amount, the temperature would fall to normal Between these attacks most patients in both groups were able to be up and about and often felt very well In this connection it is interesting that of the 28 patients treated in the Brompton Hospital, no fewer than 12 had been ill for more than twelve months before being sent to the hospital There is no doubt that the periods of relative well being are dangerous to the patient, obscuring the fact that he still suffers from a serious disease

In all cases, throughout the course of the disease cough was present and produced purulent sputum in amounts commonly between 2 oz and 7 oz daily The amount of sputum brought up each day was in some cases very large One of those seen in the Brompton Hospital had 30 oz of sputum a day, and one of the Middle East patients brought up almost 2 pints of foul-smelling pus each day for four or five weeks Fœtor of the sputum may come and go during the illness In only 4 of the Middle East cases was the sputum non fœtid throughout the period of observation, which ranged from three to twenty one months, with an average of ten months Of the Brompton Hospital group, 11 had non fœtid sputum during their stay in hospital, which averaged just over three months With longer observation the number might well have been smaller

Hæmoptysis was observed quite often in both groups of patients It was noted at the onset by 9 of the Brompton Hospital patients and by 3 of the other group as streaking of the sputum In the majority, blood streaked sputum was expectorated occasionally during the illness, and 4 patients had more substantial and repeated hæmoptyses, of which the largest seen amounted to 1 pint

Clubbing of the fingers was seen in a very high proportion, but not in all There were 2 patients in the military hospital group and 4 in the Brompton Hospital series who were not thought to have clubbing Of the 23 patients in the military hospital group who showed finger clubbing, 1 also had hypertrophic pulmonary osteo arthropathy

On physical examination of the chest, signs of pulmonary consolidation were present at some time in most of the cases, but these were seldom as gross as might have been expected from the radiological appearances, and they varied considerably during the disease

White-cell counts were carried out frequently in both series of patients It was unusual for these to be much raised Counts of 10,000–12,000 per c mm were commonly seen, on only three occasions were counts of more than 20,000 per c mm recorded In all cases the differential count showed approximately normal percentages.

Examination of the sputum was repeated many times in all these cases In each, at least twelve sputum specimens were examined for tubercle bacilli and found to be negative Also, at least one specimen was cultured for tubercle bacilli, and in no case was the bacillus grown There is undoubtedly, however, an association between chronic non specific suppurative pneumonia and pulmonary tuberculosis, which I shall discuss later In each case examination for other organisms showed a mixed flora I have already referred to the difficulty of establishing exact bacteriological diagnosis in these cases, and during the period over which they were observed the flora was found not only to be mixed but to vary from one week to the next The organisms most commonly found were of the following types *Streptococcus viridans*, hæmolytic streptococcus, non hæmolytic streptococcus, pharyngeal neisseria, *Staphylococcus aureus*, pneumococcus, organisms of the hæmophilus group, occasionally diphtheroids, and occasionally Friedländer's bacillus (*Bacterium pneumoniæ*) It was never possible to relate the organisms found to the severity or course of the infective process

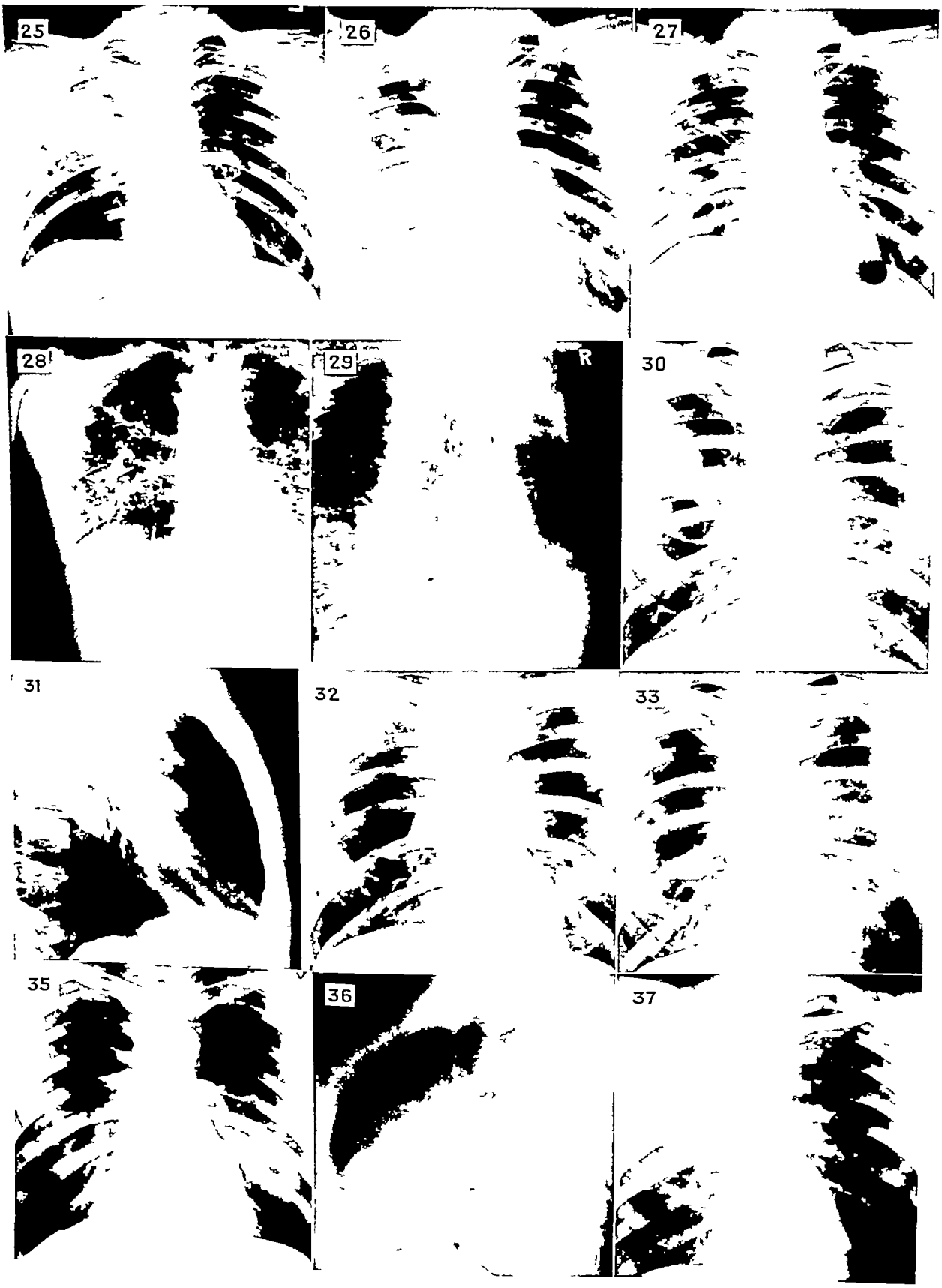
Bronchoscopic examination of these patients under local anæsthesia is of great value, and in the two groups of patients which I am describing this was only rarely omitted—either because the patient was regarded as too ill, or because he was incapable of adequate coöperation The information obtained was, first of all, of the absence of obstruction of the major bronchi, to the importance of which I shall refer again in discussing differential diagnosis, and, secondly, of the presence of redness and œdema of the mucous membrane of the bronchi associated with the affected areas, thus assisting in defining the position, and often the extent, of the affected part of the lung Further, it was often possible to aspirate for examination some of the pus welling out of the affected bronchi The advantage of examining this material for tubercle bacilli and other organisms before it is contaminated in the mouth is considerable, and more exact bacteriological information may eventually be obtained in this way

RADIOLOGICAL FINDINGS

It is possible to follow the course of this disease only by repeated radiographs From a study of those taken in the two series of cases from which I am drawing my data, I shall try to describe the more common ways in which the radiological appearances develop and progress I have previously, in describing the onset of this condition, pointed out that 5 of the military hospital cases were characterised by the early formation of an abscess cavity and were at this stage undoubtedly examples of typical solitary abscess Beginning in this way, the abscesses tend to occur most frequently in the posterior and axillary parts of the posterolateral segments of the upper lobes A large proportion of these cases do not, however, show cavitation at the onset, but consolidation only This is often segmental, but is not always confined to a single bronchopulmonary segment Thus, in 22 cases in the military hospital group there was radiological evidence of the early distribution of the lesions Of these, 7 showed involvement of a whole lobe and 1 of the whole of one lung, and in 2 there were pneumonic areas scattered throughout a lobe However, in the remaining 12 cases the lesion was clearly segmental at the onset, whether or not the consolidation broke down early to form an abscess

The subsequent radiological appearances were varied The course most usually followed was that the disease spread apparently directly into the surrounding lung,

DR NICHOLSON SUPPURATIVE PNEUMONIA



occasional abscess like masses of polymorphs Groups of fat containing cells filling alveolar spaces were common, and presented an appearance like that seen in lipoid pneumonia The bronchi were frequently distorted and dilated, and in some instances were distended and formed the walls of cavities The walls of the bronchi in the affected parts of the specimens showed at some points complete necrosis, at others inflammatory infiltration, and at others fibrosis Some of the features described in this section are shown in figs 22–24

ILLUSTRATIVE CASES

Before going on to consider the differential diagnosis and treatment, I should like to describe three cases by way of illustration

The first example (case 2 of Logan and Nicholson (1949)) shows the effect of long continued suppuration in the lung

Case 9 —A Libyan Arab, aged 26, was admitted to hospital in June, 1942 Five months before, he had become ill with fever, cough, and sputum

On admission, his general condition was fairly good, he was febrile to 101°F, and was coughing up 10 oz of fœtid purulent sputum each day His fingers were clubbed *Radiographic examination (fig 25) showed a cavity in the* right upper lobe, surrounded by consolidation and fibrosis, the transverse fissure being displaced upwards Sputum examination showed the presence of a mixed flora with pneumococci predominating Bronchoscopy, carried out shortly after his admission, showed the right main bronchus to be œdematous, with pus exuding from the upper lobe bronchus

For a month the patient improved clinically and his sputum diminished Then he had an exacerbation, and sulphapyridine, 1 g every four hours, was begun. He suffered no ill effects, and the chemotherapy was kept up for eighteen days At the end of this long course he was greatly improved and had only 3 oz of sputum each day The clinical improvement was maintained, but radiographs six months after admission (fig 26) showed that although the upper lobe changes were mainly of fibrosis, there was a large pneumonic area in the right lower lobe Two months after this the patient developed a right basal empyema At this time the lower lobe contained a cavity with a fluid level and much surrounding consolidation The empyema was drained and healed

After this the patient steadily improved The radiographic appearance of his chest a year after admission is shown in fig 27, there is considerable fibrosis throughout the right lung He was then well and free from cough and sputum Bronchograms (figs 28 and 29) showed a distorted right bronchial tree with irregular cavities in communication with the bronchi of all lobes

The second example is of less extensive disease without definite abscess formation and with a fairly satisfactory result after treatment

Case 10 —A carpenter, aged 43, was admitted to the Brompton Hospital in September, 1946 For twenty years he had had a cough with a little mucoid sputum, and had been regarded as having chronic bronchitis About three months before admission he had been taken ill with a pain in the right side of the chest, fever, and increased cough After eight or nine days, his sputum had increased, and had become purulent and streaked with blood

When admitted to hospital, he was febrile to 99°F and was coughing up 3–4 oz of purulent, non fœtid sputum His fingers were clubbed, but abnormal physical signs were not detected on examination of his chest The radiographs (figs 30 and 31) showed consolidation, mainly in the posterolateral segment of the right upper lobe Sputum examination showed a mixed flora, and *Strep viridans*, micrococci, and a few colonies of hæmolytic streptococci were grown Bronchoscopy revealed nothing abnormal apart from mild inflammatory changes at the right upper lobe orifice He was treated with postural coughing, and penicillin by intramuscular injection, clinically his condition improved, with reduction of sputum to less than $^1/_2$ oz each day The radiographic shadow diminished, but did not clear up completely

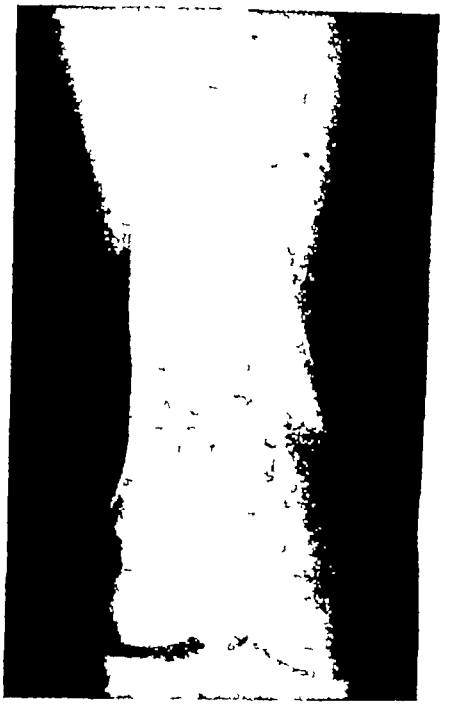


Fig 34—(Case 11) Anteroposterior radiograph of right knee showing subperiosteal new bone

He left hospital after a little more than a month, and in the next six months he had two exacerbations, with increase in sputum and in the pneumonic area in his right upper lobe A radiograph (fig 32) taken three months after his discharge from hospital shows the appearance of the lung in one of these exacerbations After this his cough and sputum diminished steadily, and radiographs of his chest showed mainly linear shadows, attributed to fibrosis in the right upper lobe A radiograph taken more than two years after his discharge is shown in fig 33

In the third case lobectomy was carried out

Case 11 —The patient was a Greek soldier, aged 37, who was admitted to hospital in September, 1942 Ten months before, he had developed fever, cough, and profuse sputum, and a diagnosis of lung abscess had been made

On admission, he was in good general condition and afebrile, but with a cough and 2 oz of purulent, non fœtid sputum each day His greatest complaint was of pain in the knees and wrists His fingers were clubbed, but abnormal physical signs were not detected in his chest He had several septic roots in his upper jaw and his oral hygiene was poor Radiographs of his wrists, ankles, and knees showed subperiosteal thickening, that of his right knee (fig 34) demonstrates this new bone formation Radiographs of his chest (figs 35 and 36) showed consolidation in the left lower lobe, with more

LEGENDS TO ILLUSTRATIONS ON PLATE

DR NICHOLSON

Fig 25—(Case 9) Postero anterior radiograph on admission showing abscess cavity in right upper lobe surrounded by consolidation and fibrosis

Fig 26—Same case Postero-anterior radiograph six months after admission showing extension of pneumonia

Fig 27—*Same case Postero-anterior radiograph one year after* admission showing fibrotic changes throughout the lung

Figs 28 and 29—Same case Anteroposterior and oblique bronchograms one year after admission showing distorted right bronchial tree

Figs 30 and 31—(Case 10) Postero-anterior and right lateral radiographs showing consolidation in posterolateral segment of right upper lobe

Fig 32—Same case Postero-anterior radiograph four months later showing fresh area of consolidation

Fig 33—*Same case Postero-anterior radiograph two years later* showing fibrotic changes in right upper lobe

Figs 35 and 36—(Case 11) Postero-anterior and left lateral radiographs showing consolidation and cavitation in left lower lobe

Figs 37 and 38—(Case 12) Pulmonary tuberculosis and chronic suppurative pneumonia: postero-anterior and right lateral radiographs showing consolidation of most of right upper lobe

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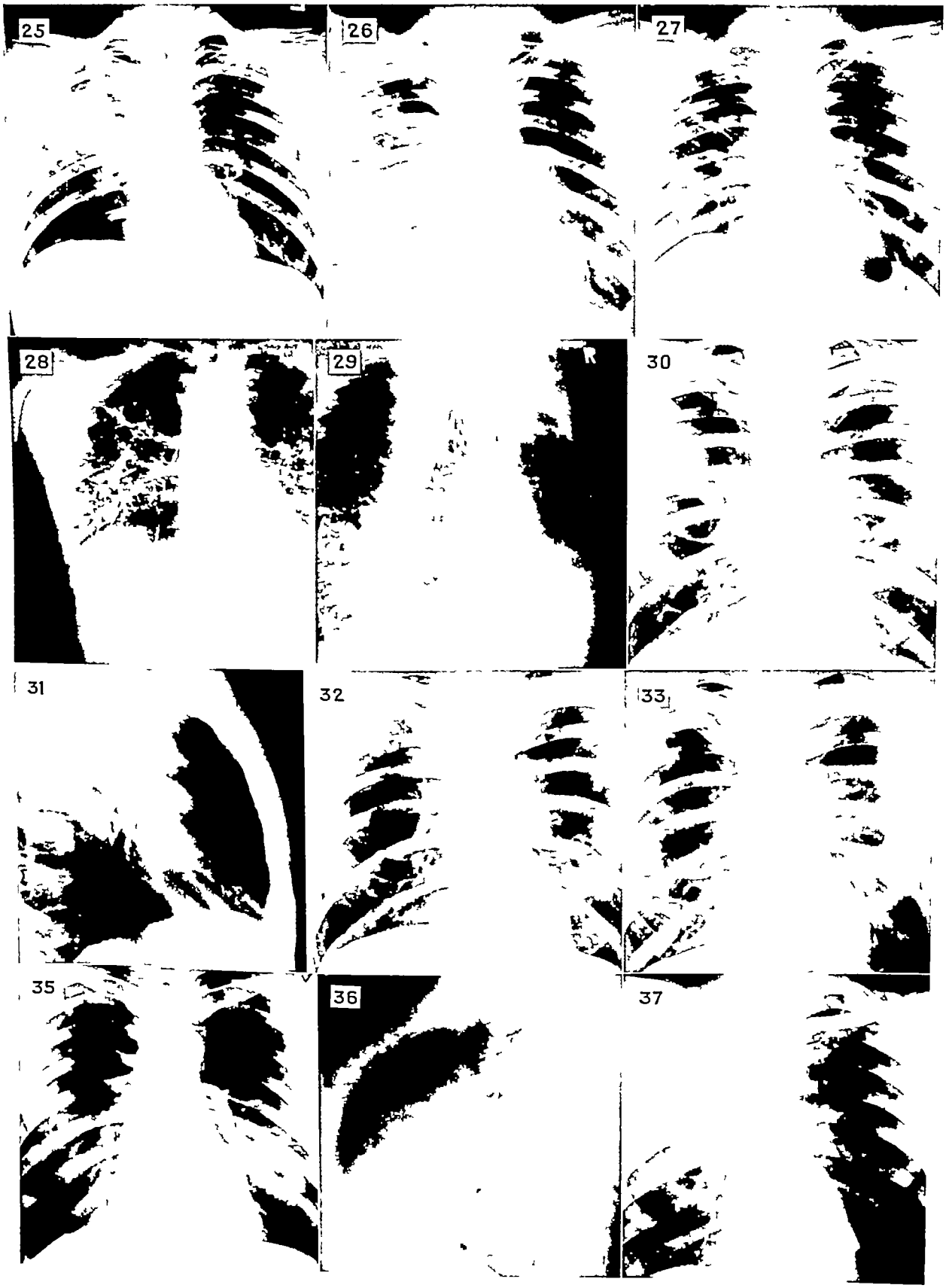
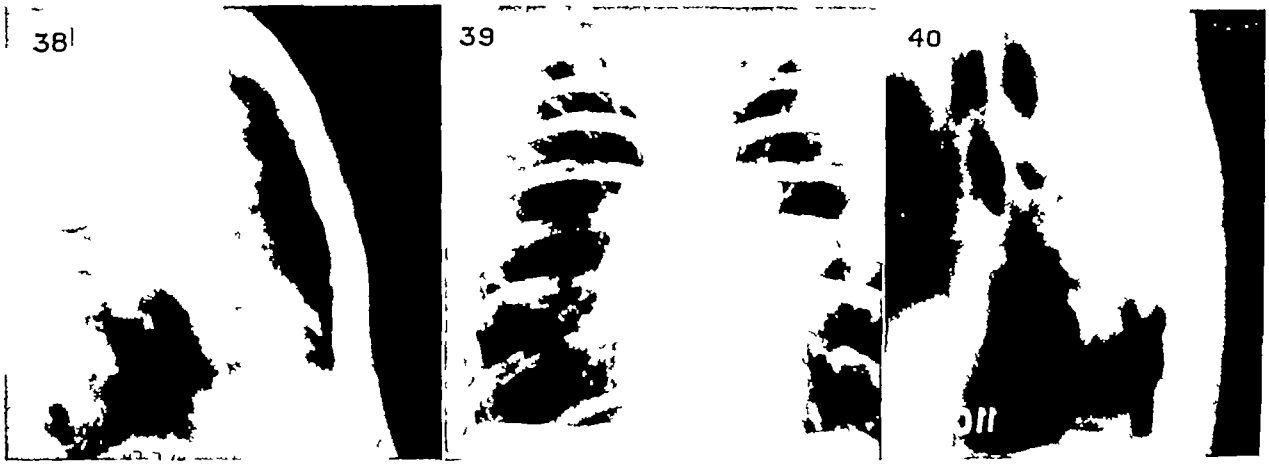
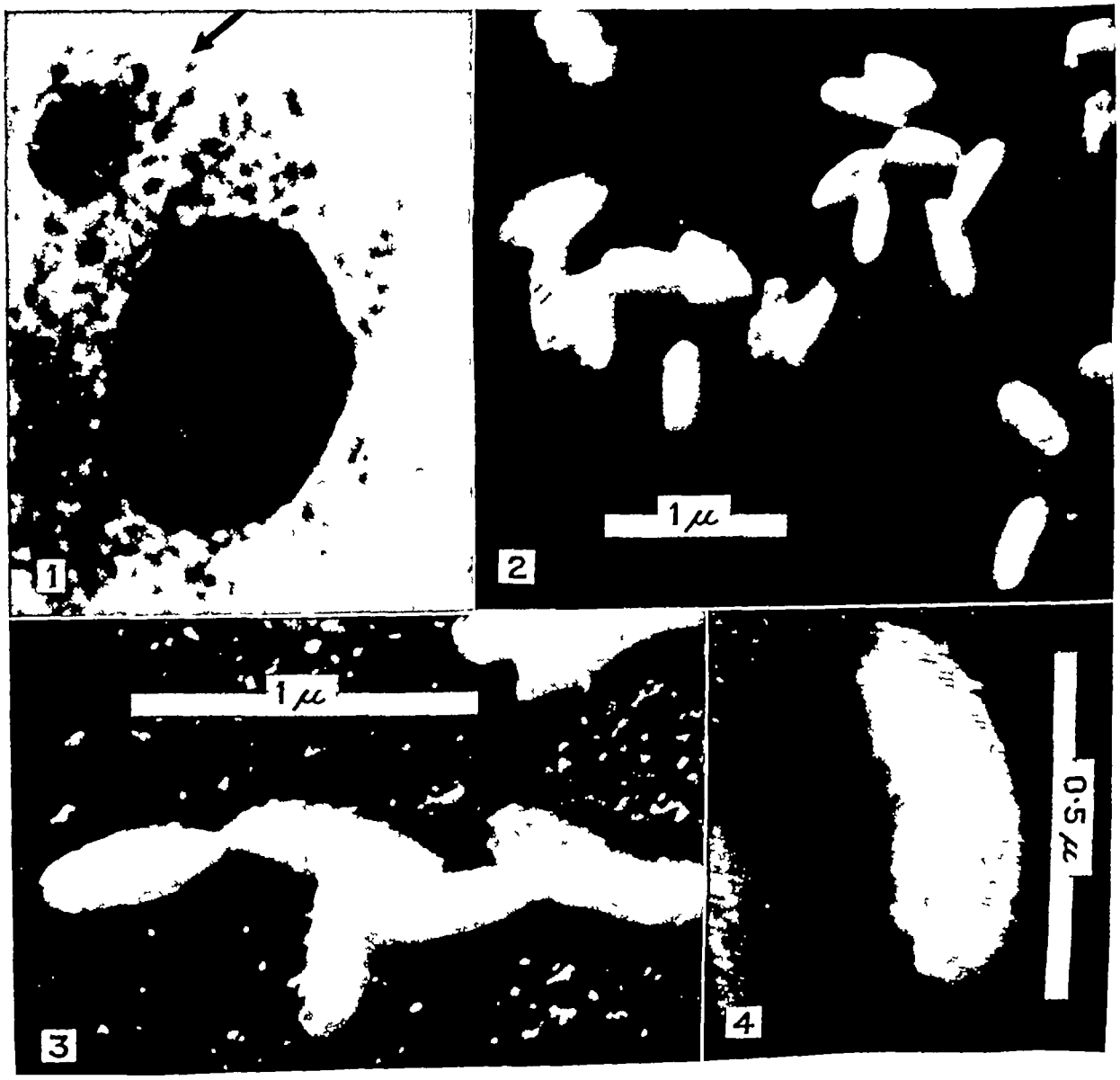


DR NICHOLSON SUPPURATIVE PNEUMONIA



DR STOKER Q FEVER IN GREAT BRITAIN



than one cavity Bronchoscopy showed a normal bronchial tree, apart from the presence of pus in the left lower bronchus

A few days after admission, two roots were removed, under local anæsthesia, from his upper jaw Next day the patient had a rigor and became febrile to 103°F His sputum increased and he became very ill, with a rigor every second day This continued and was unaffected by a course of a sulphonamide Other causes for his fever having been excluded, an attempt was made to drain the main pulmonary abscess - Rib resection was carried out, but free pleura was opened A firm lump, 2½ in in diameter, was found in the left lower lobe, with a narrow area of loosely adherent pleura over it It was not thought justifiable to carry out the drainage, and the pleural cavity was closed. Over the two months after this operation, the fever gradually settled and the patient s general condition improved. The radiological appearance at the end of this time remained essentially unchanged Fourteen months after the onset of the disease, a left lower lobectomy was carried out and was followed by complete relief of symptoms

DIFFERENTIAL DIAGNOSIS

In describing some of the specific pneumonias which are associated with cavity formation in the lung and with suppuration, I have indicated how they are distinguished from non specific suppurative pneumonia The cavitation which occurs during pneumococcal pneumonia is transient and apparently followed by healing Recognition of the chronic pneumonia due to Friedländer's bacillus may be more difficult, the course and radiological appearance may be very similar to non specific chronic suppurative pneumonia, and the distinction depends on the recovery from the sputum of *Bact pneumoniæ* in pure or almost pure culture In staphylococcal pneumonia, the clinical features, particularly at or near the onset, may strongly suggest the cause The staphylococcus may be found in pure culture in the sputum or may be recovered from the blood stream In the more chronic phase of the illness the bacteria recovered from the sputum may be varied, other organisms besides the staphylococcus having established themselves in the damaged lung In these circumstances it may be possible to guess the original nature of the infection from the clinical course of the disease, but in general the distinction [illegible]m the non specific variety of pulmonary suppura[illegible] is not then very valuable, since the outlook and [illegible]nt of both are the same The recognition of [illegible]otic infection of the lung also depends on the [illegible] of the organism

Pulmonary tuberculosis might be expected to be commonly confused with suppurative pneumonia Certainly the long course of both and the similar radiological appearance may give rise to difficulties in diagnosis Nevertheless I believe it is usually possible to make the distinction In the first place, there is the association of pulmonary suppuration with sources of infected material in the respiratory tract Then, the onset with the production of a considerable, and sometimes very large, amount of sputum fairly early in the disease is characteristic of suppurative pneumonia This is quite unlike the early stages of pulmonary tuberculosis, in which it is rare for large quantities of sputum to be produced. Finally, repeated examination of the sputum for tubercle bacilli with negative results, both from direct examination and from culture, may be regarded as adequately distinguishing suppurative pneumonia from tuberculosis

There is, however, a group of cases, of which I propose to describe an example, in which the two diseases occur together

Case 12 —A man, aged 51, was admitted to the Brompton Hospital in October, 1947 He had been regarded as having chronic bronchitis since the end of the 1914–18 war, and since then had had some purulent sputum Six months before admission, he became ill with fever and malaise After three or four days of this illness he, as he said, "smelt fumes in his mouth' when lying on his left side There was no great increase in his cough or sputum, but after this the sputum did occasionally become offensive A month before admission he noticed streaks of blood in the sputum, and he was seen at his local tuberculosis clinic, where his sputum was repeatedly examined and found free from tubercle bacilli

On admission to the Brompton Hospital, he was febrile to 100°F, he had some cough, and was bringing up 2 oz. of purulent, but not fœtid, sputum each day His fingers were clubbed, and he had physical signs suggesting consolidation over the upper part of his right chest posteriorly The radiological appearance, shown in figs 37 and 38, did not change much during his stay in hospital It will be seen that there is consolidation in the right upper zone with probably irregular cavitation in it The lateral view shows that a large part of the upper lobe is consolidated

Examination by smear and concentration of eight successive specimens of sputum again failed to demonstrate the tubercle bacillus The sputum contained a mixed flora, and on one occasion only *Bact pneumoniæ* was isolated from it Bronchoscopy revealed no abnormality in the bronchial tree A trap specimen of secretion aspirated at bronchoscopy from the upper lobe bronchus did not contain tubercle bacilli A course of penicillin and sulphamezathine was given, and this was followed by reduction in the amount of sputum and gradual clinical improvement Then, two days after the bronchoscopy, a few tubercle bacilli were found in his sputum, and successive daily specimens after this showed the organisms to be present in increasing numbers

The patient died at home nine months after the onset [illegible] a coronary thrombosis Necropsy is reported to have [illegible] extensive fibrocaseous tuberculosis of the right upper [illegible]

It is difficult to believe that this was simply a c[illegible] pulmonary tuberculosis from the beginning It is s[illegible] far more likely that suppurative pneumonia develo[illegible] in a pulmonary segment that was already the site of a [illegible] healed or quiescent tuberculous lesion The destructive suppurative process involved the possibly encapsulated tuberculous focus, and allowed its still living bacilli to invade the partly destroyed lung

I have already drawn attention to the relation of bronchial carcinoma to pulmonary suppuration, and in practice the distinction between suppuration associated with carcinoma on the one hand, and non specific suppurative pneumonia on the other, may be extremely difficult For example

Case 13 —A Norwegian seaman, aged 52 was admitted to hospital in January, 1949 He had been ill for two months with a cough and an ounce or two each day of mucopurulent sputum never fœtid. He had lost 10 lb in weight A radiograph (fig 39) taken shortly before admission showed consolidation in the left mid zone Lateral views showed the consolidation to be in the apical segment of the left lower lobe, and this was confirmed by lateral tomograms (fig 40) Bronchoscopy showed pus exuding from the orifice of the bronchus to this segment the orifice itself was inflamed but no growth was seen A biopsy specimen taken from it showed no evidence of growth The patient was treated by postural coughing and by penicillin and sulphamezathine As a result of this, his sputum diminished in amount but no striking change took place in the radiological appearance

A month after the patient s admission, in view of the lack of radiological change and in the belief that he had a carcinoma probably of the bronchus to the apical segment of his lower lobe beyond the range of bronchoscopic vision it was decided

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. NICHOLSON

Fig 39—(Case 13) Chronic suppurative pneumonia regarded as bronchial carcinoma: postero-anterior radiograph showing consolidation in left mid zone

Fig 40—Same case Left lateral tomogram showing consolidation to be in apical segment of left lower lobe

DR. STOKER

Fig 1—*R. burneti* M1 strain. Intracytoplasmic group of rickettsia seen in Giemsa-stained peritoneal smear from a guinea-pig inoculated with a heavily infected yolk-sac suspension. (× 6000)

Fig 2—*R. burneti* Henzerling strain. Electron microphotograph gold shadowed. (× 27 000.)

Fig 3—*R. burneti* Christie strain. Electron microphotograph gold shadowed (× 50 000)

Fig 4—*R. burneti* Christie strain. Electron microphotograph gold shadowed (× 100 000)

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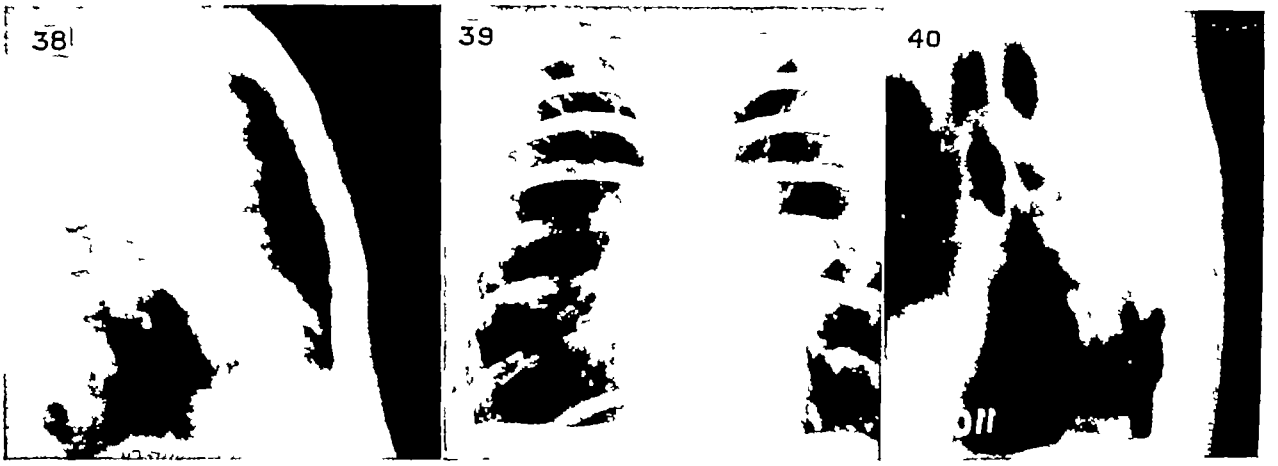
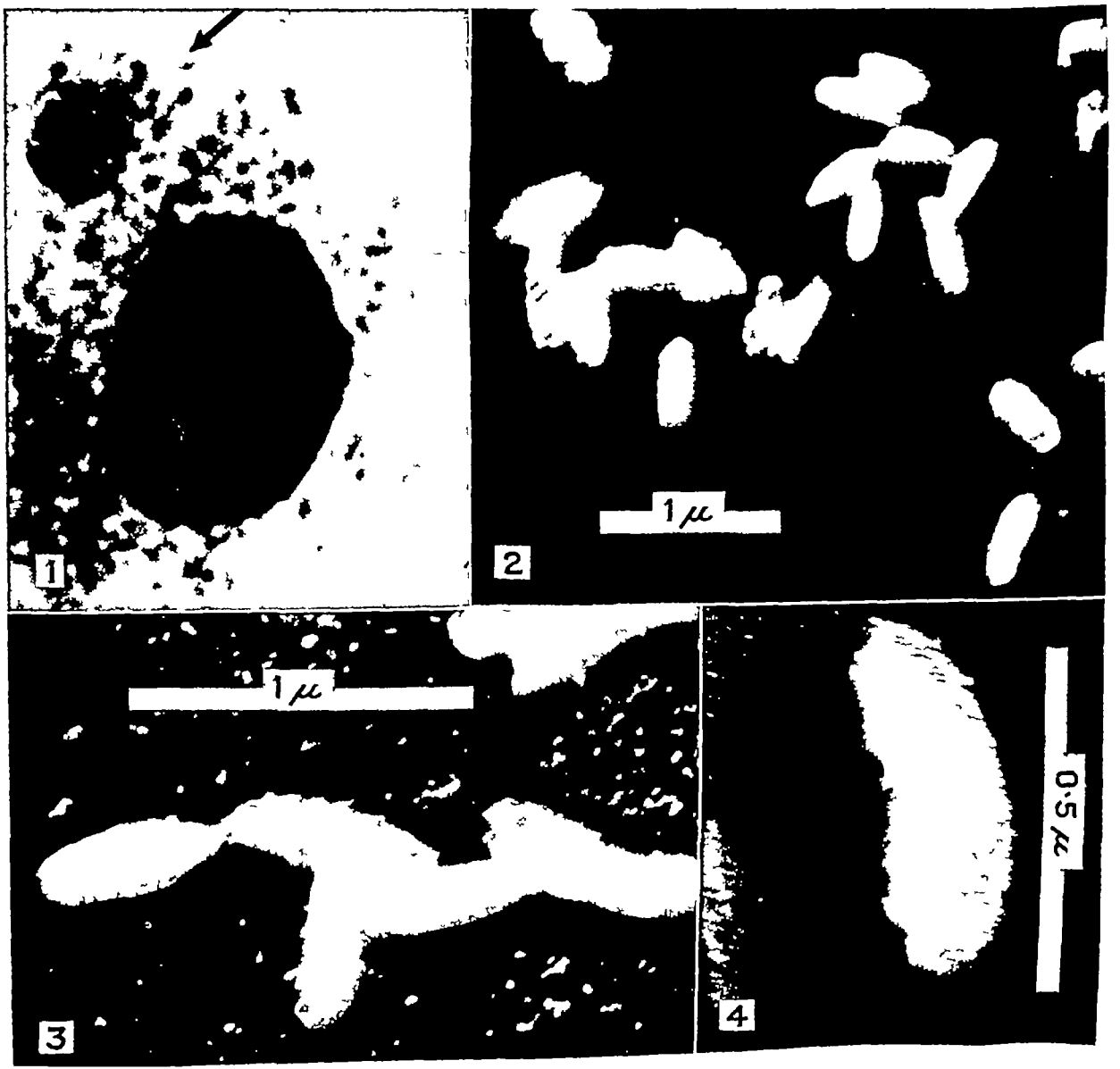


DR STOKER Q FEVER IN GREAT BRITAIN



It is possible, I think, to summarise from these results a reasonable programme of treatment When the patient first comes under care in hospital his sputum should be examined and cultured and the sensitivity of its organisms to antibiotics and the sulphonamides determined Meanwhile, an intensive course of postural drainage and coughing under the care of a physiotherapist should be begun In almost all cases the sputum contains large numbers of organisms sensitive to penicillin, and penicillin should be given in doses of the order of 1 million units per day I think it is valuable at the beginning of such a course to give sulphamezathine in the usual dosage for six or seven days On such treatment as this, the patient in the matter of a few days feels very much better and his sputum begins to decrease, and, if this was offensive at the beginning, the fœtor will cease to be noticeable It may be worth while after perhaps two weeks, if the sputum persists, to re-examine its flora, since it may now contain organisms which are mainly penicillin resistant, and one of the other antibiotics may be useful In the majority of cases by such measures as these it is possible to achieve a state in which there is very little—but usually still purulent—sputum, a feeling of well being, and radiographic evidence of fibrosis where there had previously been consolidation and cavitation

This must be regarded as an adequate result in some patients—that is to say, those who, by reason of extensive and perhaps bilateral disease, or of old age, or of other related or unrelated diseases, are unsuitable for thoracotomy and pulmonary resection Many of these patients will have further episodes of pulmonary infection, and arrangements should be made to admit them to hospital for further treatment by postural drainage and chemotherapy during each recrudescence

In those patients where no such contra indications are apparent, the next step should be to carry out bronchography in order to determine the extent of the severely damaged lung—that is to say, which lobe or lobes are involved and which are apparently intact Where the extent of the damage, as shown by bronchograms, does not preclude it, the affected lobe or lung must be resected This is the only measure likely to restore the patient to health and to stop the progression of the disease

Summary

Certain specific pneumonias associated with suppuration are described

The relation of bronchial carcinoma to pulmonary suppuration is discussed.

Patients with suppurative pneumonia not due to a specific organism or to bronchial carcinoma have in the sputum a mixed bacterial flora, the members of which are not specifically invasive for the lungs These cases are held to be localised aspiration pneumonias, and form a series ranging from those in which the suppurative changes are slight to those which present as acute solitary lung abscess

Cases of non specific suppurative pneumonia may progress chronically, and their course is similar whether they begin as solitary abscesses or as predominantly pneumonic lesions

In chronic non specific suppurative pneumonia, once considerable suppurative changes have occurred, resection of the affected lobe or lung is the only measure likely to restore the patient to health

I wish to thank the members of the Brompton Hospital staff for allowing me to use the hospital records in particular I am grateful to Dr Clifford Hoyle Dr J G Scadding and Dr A. Foster Carter, who allowed me to make reference to cases under their care and gave me much other assistance I also owe thanks to Prof M L Rosenheim who allowed me to use the records of a case under his care at University College Hospital and to Mr Andrew Logan for his help and coöperation over many years

References at foot of next column

Q FEVER IN GREAT BRITAIN

EPIDEMIOLOGY OF AN OUTBREAK

B P MARMION
M.D Lond
OF THE VIRUS REFERENCE LABORATORY, PUBLIC HEALTH LABORATORY SERVICE, COLINDALE

M G P STOKER
M.D Camb
LECTURER IN PATHOLOGY, UNIVERSITY OF CAMBRIDGE

EVIDENCE that some of the cases of atypical pneumonia occurring in Great Britain were due to *Rickettsia burneti* was provided when 3 of 24 patients with this syndrome were found to have complement fixing antibodies to this rickettsia (Stoker 1949) Titres in 2 of the cases were high and followed an illness clinically suggesting Q fever, while the titre in the third case was lower and was more probably related to past infection than to the recent attack of pneumonia One of the patients had never been abroad and it seemed certain that he had acquired his infection in this country

The final proof of the presence of Q fever in Great Britain was the isolation of the causal rickettsia, *R burneti*, from the blood of a patient with atypical pneumonia during a small outbreak at the Royal Cancer Hospital London The clinical aspects of Q fever in this outbreak were described by Harman (1949) and the bacteriology by MacCallum et al (1949)

Since the outbreak at the Cancer Hospital sporadic cases of Q fever have been found in Kent, Devon,

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that his chest should be explored Left thoracotomy was performed, and a hard mass was found in this segment, densely adherent to the chest wall Pneumonectomy was carried out, and the patient recovered and returned to Norway On examination of the specimen, no evidence of carcinoma was found, but the apical segment of the lower lobe was occupied by a chronic suppurative process

Obviously, when on bronchoscopy a biopsy specimen containing carcinomatous tissue can be obtained, diagnosis is not difficult At the other extreme, when cases of extensive pulmonary suppuration show considerable radiological shrinkage of the lesion as well as clinical improvement on treatment by postural coughing and chemotherapeutic agents, they may be cautiously regarded as not being associated with bronchogenic carcinoma Even this is by no means certain and must be checked by repeated bronchoscopy When the lesion is of lobar distribution more weight can be given to a negative bronchoscopy, since an associated growth would almost certainly have involved the main lobar bronchus and should therefore be visible bronchoscopically With lesions of segmental distribution a negative bronchoscopy is not so significant, since the segmental bronchus can be involved by a carcinoma which may be beyond bronchoscopic vision It is this sort of lesion which gives the greatest difficulty in differential diagnosis In the active phase of the disease no important information is to be obtained from bronchography, since even where there is no carcinomatous obstruction the iodised oil usually fails to enter the relevant bronchus I am sure that in cases of doubt, if other considerations allow it, thoracotomy should be performed

The only other condition to which I am going to refer is bronchiectasis It is possible that bronchiectasis complicated by consolidation of the lung around dilated and inflamed bronchi may be confused sometimes with chronic suppurative pneumonia The history will usually suggest the correct diagnosis The bronchiectatic patient will commonly have a long history, very frequently going back into childhood, of cough and sputum He will have had pneumonic episodes in the past, and the [illegible]onia with which he presents himself will usually [illegible]rly rapidly However, pulmonary suppuration [illegible]e associated with bronchiectasis and arise by the [illegible]tion of infected material from the dilated bronchi [illegible] other parts of the lung

TREATMENT

In both the groups of cases to which I have been referring, the first method of treatment adopted when the patient was admitted to hospital was postural drainage under the care of a physiotherapist Both groups were given courses, in some cases repeated, of one or other of the sulphonamides Of the military hospital series, only 8 were given penicillin, and even in these cases the doses given were small by present day standards, since the drug was difficult to obtain in the Middle East in 1944 and 1945 In the Brompton Hospital group penicillin was administered in much larger dosage and for longer periods The results in patients treated by such measures as these are summarised in table II In the military hospital group, 1 patient became free from symptoms, and the radiograph of his chest showed only slight fibrosis Another patient became well with an apparently normal radiograph, but had 1 oz of purulent sputum each day In the Brompton Hospital group, following these measures, 3 patients became free from symptoms and had relatively slight fibrotic changes to be seen radiologically in their lungs

Both series included patients who were greatly improved clinically and had much less sputum than before treatment, but in whom radiological changes indicated severe fibrosis In the military hospital series there were 2 such cases, and in the Brompton Hospital series, 7 Bronchograms of patients with gross fibrotic changes showed

TABLE II—RESULTS IN PATIENTS TREATED WITH CHEMOTHERAPY AND POSTURAL COUGHING

—	No of cases	
	Brompton Hospital	Military Hospital
Symptom free and with slight radiological changes	3	2
Improved but with severe fibrosis	7	3
With progressing disease	4	9
Died	1	2
Total	15	15

13 of the Brompton Hospital group, and 10 of the military hospital group were treated surgically

distorted and dilated bronchi in the diseased area and it is hard to believe that the outlook for such patients is other than bad, in view of the danger of reinfection of the damaged lung and further progression of the disease

In the series of patients treated at the Brompton Hospital, there were 4 who, after postural drainage and chemotherapy, remained essentially unchanged with progressive disease Of the other series, 9 continued over the period for which they were observed to be ill with extending inflammatory changes in their lungs There were also 2 patients in the military hospital series who died, 1 from cerebral abscess and 1 from overwhelming infection In the Brompton Hospital group 1 patient died from spread of his pneumonic process

The most obvious difference between these results in the two series is that fewer of the Brompton Hospital than of the military hospital patients were left with progressing disease, and more had symptomatic improvement, though with residual fibrosis There can be little doubt that this difference is due to the use of penicillin in the Brompton Hospital cases What effect penicillin is likely to have on long term prognosis in these chronic cases is difficult to assess at present, since it has been used in adequate dosage for so short a period

In each group surgical resection of the diseased lobe or lung was carried out in a number of cases In the Brompton Hospital series lobectomy was carried out in 10 cases and pneumonectomy in 3 In all but 2 cases these procedures were followed by satisfactory results, the patient having either no symptoms or no more than the expectoration of a trace of mucoid sputum with no evidence of remaining pulmonary suppuration In 1 of the 2 unsuccessful cases the remaining lobe is the site of further suppuration, and in the other the patient died during the operation In the military hospital group lobectomy was carried out in 9 cases and pneumonectomy in 1 Satisfactory results were obtained in 6 cases, and there were 4 deaths

In observing these results of treatment it has seemed to me that the main advantage—a very great one—which has accrued from the introduction of penicillin is that its use reduces the amount of the patient's sputum and improves his general condition, thus increasing the safety of resection of the diseased pulmonary tissue The main danger in the use of penicillin may well be that it reduces symptoms while leaving extensive fibrotic and destructive changes in the lungs In some cases, where pulmonary resection is precluded by the extent of the disease or other considerations, the reduction of symptoms is wholly beneficial, but in others it may give doctor and patient a quite unjustified sense of security and thus prevent or delay the necessary operation

Other methods of treatment were used In the military hospital series external drainage of cavities was carried out in 6 cases In no case did this procedure benefit the patient, and the suppurative disease continued to spread in the lung In 1 case in each series a thoracoplasty was carried out, without benefit in either instance

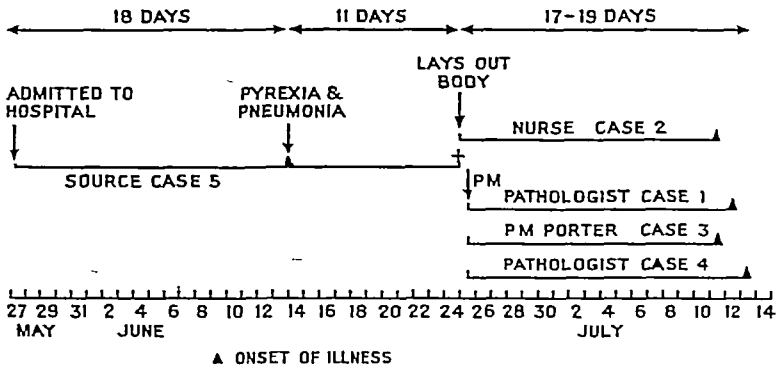


Fig 1—Time relation of illness of case 5 to onset of illness in cases 1–4

found in Q fever This information was not available at the time, but investigations proceeded on the hypothesis that case 5 had had Q fever and that either he had been admitted to hospital during the incubation period of the disease, having been infected shortly before admission, or that he had been infected very shortly after admission The period of eighteen days between admission and the onset of his illness was consistent with either possibility

These alternatives of infection outside or inside the hospital were investigated concurrently, the first by a visit to case 5's home in Kent, the second by a search for any previous cases of Q fever among the patients in X ward or the staff of the hospital in general

Of the 31 patients who had been in X ward at the same time as case 5, none had had a suspicious fever before the onset of his illness, and only 6 had had any fever between May 27 and June 24, when case 5 had been in the ward In 2 patients the fever had clearly been related to a recent operation, and in the other 4 probably to their cancerous condition Sera taken three or four months later from 5 of the patients who had been febrile were negative for *R burneti* antibodies, the sixth patient had died shortly after discharge from hospital. All the 31 patients were followed up, and none had had any unexplained febrile illness after discharge from hospital An attempt was made to examine the serum of each patient, and this was done with negative results in 22 patients, but in 5 cases blood could not be obtained owing to death since discharge, and 4 patients refused venepuncture

The staff of X ward, other than case 2, consisted of a house physician, a sister, eight nurses, two ward orderlies, and two maids None of these persons had been ill and all, except the house physician and the maids, who refused specimens, were serologically negative There was no other illness clinically or serologically suggesting Q fever in the general staff of the hospital at this time, and no record of the importation of any likely source of Q fever, such as raw milk, raw dairy foods, and animal products was found on inquiry at the hospital catering department

It therefore seemed that case 5 had been admitted while incubating Q fever It was also established that he had not been exposed to any suspicious case or possible source of Q fever during the journey on May 27 from his home in Kent to the Royal Cancer Hospital The ambulance crew who had been with him on this journey were well and serologically negative

EPIDEMIOLOGICAL STUDIES IN KENT

Early in September a visit was made to case 5's household, which consisted of his wife and two daughters, in a seaside town of N E Kent Another married daughter and two married sons were occasional visitors The three daughters and one son were quite well and their sera were negative The other son was also well, but he lived in another part of the country, and his serum was not examined Case 5's wife (case 6), however, was confined to bed with a vague illness complicated by cardiac failure, and her serum had a high titre of *R burneti* antibodies (1/640) Her illness had started with diarrhœa on July 25, and a minor stroke followed on Aug 1 The clinical picture was not that of Q fever, and it was uncertain whether the *R burneti* antibodies resulted from the illness or past exposure She had not visited or seen her husband since he went to hospital or after his death, but had received letters from him

Case 5 had been a jobbing tailor by trade but of recent years had only done work for neighbours and friends He had neither history of occupational exposure to animals, as is found in some cases of Q fever, nor had he repaired any clothing soiled with animal excreta, handled packing straw, or recently received food parcels from abroad There was a small retail dairy A about 100 yards from his house, and a butcher's shop with a sausage manufacturing plant at the back of the premises

The investigations of Huebner et al (1948) in California showed that raw milk from many dairy herds was infected with *R burneti* So, since no other source of infection had been found to explain case 5's illness, his milk-supply was investigated His household was supplied by the small retail dairy A which received bulked heat treated milk from London and some raw milk from local farms These two milks were bottled at the dairy and sold separately, and it was impossible to find out which customers had raw and which had pasteurised milk, if, indeed, distribution was at all consistent Dairy A and two other local dairies B and C, one (B) combined with a farm and both unconnected with case 5's household, were investigated Volunteers were bled, and their sera were tested for *R burneti* antibodies At dairy A, 2 of the 8 volunteers had low titres of complement-fixing antibodies to *R burneti*, and 6 of the 19 volunteers from dairies B and C were positive, 2 having titres of 1/80 (see table) One of these two men had had a febrile illness with pneumonia three months before This man, unlike some of the others, had never been abroad, and consequently it seemed

DISTRIBUTION OF *R burneti* TITRES IN FARM AND DAIRY WORKERS AND CATTLE

Place		Titre to *R. burneti*								Total
		< 1/10	1/10	1/20	1/40	1/80	1/160	1/320	1/640	
Kent										
Dairy A	e	6	2	—	—	—	—	—	—	8
,, B	e	7	4	—	—	1	—	—	—	12
,, C	e	6	—	—	—	1	—	—	—	7
Farm K	e	2	1	—	—	—	—	—	—	3
	c	43	2	—	—	—	—	—	—	45
W	e	1	1	—	—	—	—	—	—	2
	c	18	2	1	1	1*	—	—	1*	24
L	c	2	—	—	—	—	—	—	—	2
	c	23	—	—	—	—	—	—	—	23
Gl	e	1	—	—	—	—	—	—	—	1
	c	3	—	—	—	—	—	—	—	3
Gol	e	—	—	—	—	—	—	—	—	—
	c	17	—	—	—	—	—	—	—	17
Go	e	1	—	—	—	—	—	—	—	1
	c	20	—	—	—	—	—	—	—	20
R	e	—	—	—	1	—	—	1	—	2
	c	10	—	—	—	1*	—	—	—	11
Devon										
Farm D	e	1	—	—	—	—	—	—	—	1
	c	12	1	1	—	—	—	—	—	14

e = employee(s) * = *R. burneti* isolated from milk of cow
c = cows * = *R burneti* not isolated from milk of cow

Gloucestershire, Wiltshire, Oxfordshire, and Denbighshire The highest incidence has been in Kent, and the next highest in Devon Possibly these findings are partly due to the more intensive investigation of these two counties because of the identification of the sources of the Cancer Hospital outbreak in them

Preliminary accounts of the epidemiology of the outbreak of Q fever at the Royal Cancer Hospital have been included in papers by MacCallum et al (1949) and by Stoker and Marmion (1950) We describe here the epidemiological investigation in some detail and discuss the validity of the conclusions

LABORATORY METHODS

Examination of Sera

Specimens of human and bovine sera were examined for Q fever antibodies by complement-fixation tests, the technique has been described by Stoker (1949) Human sera were inactivated at 56°C for 30 minutes, but bovine sera (obtained from the jugular vein) were inactivated at 60°C for 30 minutes, because it was found that treatment at the higher temperature reduced the number of specimens showing a low titre partial fixation, which was probably non specific

A formolised purified yolk sac antigen made from the Henzerling strain of *R burneti* was used for all tests At first this was supplied by Dr Cox, of Lederle Laboratories, New York, but later the strain itself was obtained and antigen was prepared at Cambridge by the technique used in Dr Cox's laboratory and described by Wolfe and Kornfeld (1949) No differences were detected in direct comparisons between the antigens made in the U S A and England

Large batches of human and bovine sera were first tested at a single dilution of 1/8 or 1/10, and those which showed fixation were retested over a range of dilutions to determine the end point A titre of 1/10 was considered to be the lowest significant dilution, but higher titres were generally found in specimens from humans who had recently had Q fever, and from cows which were excreting *R burneti* in the milk at the time

Examination of Milk

Duplicate samples of about 15 ml of milk were taken into universal containers with rubber lined screw caps, and sent to the laboratory in a vacuum flask or insulated box packed with solid carbon dioxide One sample was examined at the Department of Pathology, Cambridge, and the other at the Virus Reference Laboratory, Colindale Milk was pooled in lots representing 2–4 farms for the initial examination, and the components of positive pools were later retested individually

Two previously bled guineapigs weighing 300–500 g were injected with 3 0–4 0 ml of milk intraperitoneally and caged with an uninoculated control animal so that cross infection from animals in other cages might be detected Rectal temperatures were recorded daily, and blood was removed for passage from some guineapigs which became febrile 8–15 days after inoculation. Test and control animals were killed and bled four weeks after inoculation, and the sera were subsequently tested in parallel with the pre inoculation samples for complement fixing antibodies to *R burneti* Provided the uninoculated controls showed no serological response, a rise in the titre from less than 1/5 in the first to more than 1/20 in the second specimen was taken to indicate infection with *R burneti*

ROYAL CANCER HOSPITAL OUTBREAK

The case numbers correspond to those used by Harman (1949) The outbreak can be divided into two probably unconnected episodes, consisting of 4 cases in July and 2 in September, 1949 The outbreak is described mainly in the sequence in which the investigation evolved

On July 20, 1949, the Virus Reference Laboratory received specimens of serum and clotted blood from a nurse and a pathologist at the Cancer Hospital who had been diagnosed as pyrexia of unknown origin, possibly Q fever Isolation studies and identification of the rickettsia occupied about a month, and the diagnosis of Q fever in the 2 cases was certain by the end of August Epidemiological investigations were [illegible] 21, 1949, when a visit was made to the hospital At this time the pathologist (case 1) and the nurse (case 2) had fully recovered from their attack of Q fever

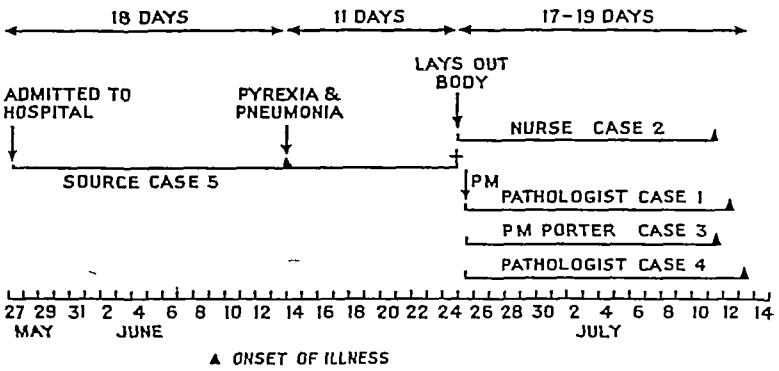
Case 1 was interviewed, and the date of onset of his illness was established as July 12 The incubation period of Q fever is usually about 19 days, with a range of 14 to 26 days Case 1 had therefore been infected during the period June 17–28, probably on June 24 or 25 He kept a diary and could account for his movements outside the hospital during this period

Case 2 had become ill on July 10–11, about a day earlier than case 1, and although she could not remember in detail her activities during the period June 12–29, when she was infected, it was clear that she had not visited any of case 1's list of places or entertainments outside the hospital It therefore seemed probable, that both case 1 and case 2 had been infected inside the hospital

Contact between case 1 and case 2 was not frequent as a consequence of their hospital duties, but nevertheless a common source of infection seemed likely because of the almost simultaneous onset of their illnesses A possible common source of infection could have been a patient, and in view of case 1's work, which included the performance of necropsies among other clinico pathological duties, a search of the necropsy records was made for a patient who had died in X ward, where case 2 had been working, and who had been examined post mortem by case 1 There had been no necropsies from June 10 to June 20, from June 20 to June 27 there had been six, and then no more until July 14 Two of these six patients had come from X ward, but only one had been examined by case 1 This was case 5, whose autopsy had been done on the morning of June 25, and the cause of death had been recorded as cerebral thrombosis and lobar pneumonia It was then discovered that case 2 had been in frequent attendance on this patient and had "laid him out" after his death on June 24

The necropsy had also been attended by a mortuary attendant (case 3), and another doctor (case 4) On inquiry it was found that the mortuary attendant was ill with bronchitis and pneumonia in another hospital, and that the doctor had recently recovered from a mild febrile illness Both were bled and had high titres of *R burneti* antibodies, although their illnesses were not typical of Q fever The onset of case 3's illness was about July 10, and case 4's about July 13, which was consistent with infection at about the same time as cases 1 and 2 The staff of the pathological department consisted of 15 persons 3 doctors, 2 hæmatologists, 4 technicians, 1 mortuary attendant, 2 secretaries, 2 cleaners, and 1 boy Only the two doctors (cases 1 and 4) and the mortuary attendant (case 3) who had attended the necropsy had had proved attacks of Q fever, the remaining 12 members of the department were well Sera from the 4 technicians and the other doctor, whose daily work resembled in other respects that of cases 1, 3, and 4, showed no *R burneti* antibodies The terminal illness of the patient and his necropsy thus provided a possible common source of infection for the nurse, the two pathologists, and the mortuary attendant

Case 5, a man aged 78, had been admitted to X ward on May 27 so that his dysphagia, thought to be due to a carcinoma, could be investigated Eighteen days after admission he became febrile and signs of broncho pneumonia were found This was not an unexpected complication, for his dysphagia led to the aspiration of food and fluids into his lungs The bronchopneumonia did not respond to chemotherapy with penicillin and sulphonamides, and he died on June 24 The time relationship of case 5's illness to that of the other cases described above is shown in fig 1 Later investigations by Whittick (1950) have shown that the gross and histological appearances of case 5's lung correspond to those



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The investigations of Huebner et al (1948) in California showed that raw milk from many dairy herds was infected with *R burneti* So, since no other source of infection had been found to explain case 5's illness, his milk supply was investigated His household was supplied by the small retail dairy A which received bulked heat treated milk from London and some raw milk from local farms These two milks were bottled at the dairy and sold separately, and it was impossible to find out which customers had raw and which had pasteurised milk, if, indeed, distribution was at all consistent Dairy A and two other local dairies B and C, one (B) combined with a farm and both unconnected with case 5's household, were investigated Volunteers were bled, and their sera were tested for *R burneti* antibodies At dairy A, 2 of the 8 volunteers had low titres of complement fixing antibodies to *R burneti*, and 6 of the 19 volunteers from dairies B and C were positive, 2 having titres of 1/80 (see table) One of these two men had had a febrile illness with pneumonia three months before This man, unlike some of the others, had never been abroad, and consequently it seemed

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Kent										
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B	e	7	4	—	—	1	—	—	—	12
C	e	6	—	—	—	1	—	—	—	7
Farm K	e	2	1	—	—	—	—	—	—	3
	c	43	2	—	—	—	—	—	—	45
W	e	1	1	—	—	—	—	—	—	2
	c	18	2	1*	1	1*	—	—	1*	24
L	e	2	—	—	—	—	—	—	—	2
	c	23	—	—	—	—	—	—	—	23
Gl	e	1	—	—	—	—	—	—	—	1
	c	3	—	—	—	—	—	—	—	3
Gol	e	—	—	—	—	—	—	—	—	—
	c	17	—	—	—	—	—	—	—	17
Go	e	1	—	—	—	—	—	—	—	1
	c	20	—	—	—	—	—	—	—	20
R	e	—	—	—	1	—	—	1	—	2
	c	10	—	—	—	1*	—	—	—	11
Devon										
Farm D	e	1	—	—	—	—	—	—	—	1
	c	12	1	1	—	—	—	—	—	14

e = employee(s) * = *R. burneti* isolated from milk of cow
c = cows * = *R burneti* not isolated from milk of cow

certain that Q fever was present in the area, and that the illness of case 5 and his wife did not represent an isolated importation of *R burneti*

Next, the seven local farms supplying dairy A were visited, some of the farm workers and cattle bled, and samples of the milk taken Here again, serological positives were found among the farm workers and cattle Two of the farm workers with the higher titres had had severe attacks of "influenza" during the previous six months or year The table shows the distribution of the titres against *R burneti* found in the men and the cattle

Finally, *R burneti* was isolated from the herd milk of two of the farms Herd milks from all farms were tested on two occasions at a week's interval, and from the positive ones at intervals during five months Farm W was positive on each of four tests covering a period of five months, and farm R was positive on each of three tests during a period of three months Milks from dairies B and C were negative on guineapig inoculation These tests were made nine months after the original visits to bleed the employees of dairies B and C It is of interest, however, that in 3 recently discovered cases of Q fever the patients had had their milk from one or other of these two dairies

Fig 2 summarises the position It will be noted that in dairy A and its farms there was good agreement between the presence of *R burneti* in the milk and antibodies in man and cattle

SECOND EPISODE AT ROYAL CANCER HOSPITAL

While the investigations in N E Kent were in progress, an unexpected development had taken place at the Royal Cancer Hospital The staff had been closely watched for any secondary cases infected from the first 4 patients, although published evidence suggests that such spread is exceedingly rare in outbreaks of Q fever

On Sept 10 the laboratory was told that a physicist (case 7) working in an institute attached to the hospital, was ill with a condition clinically suggesting Q fever

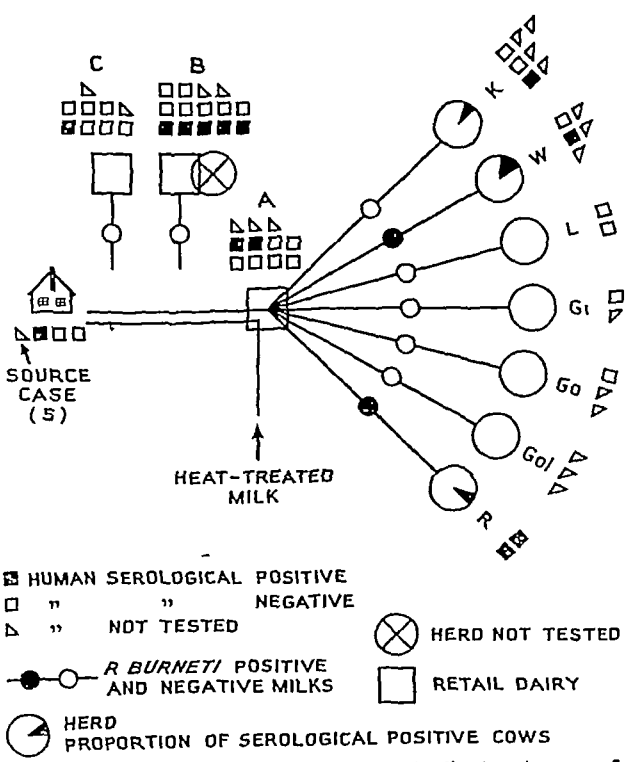

Fig 2—Distribution of antibodies to *R. burneti* in district where case 5 had lived

The date of onset of case 7's illness was Sept 7, about two months after the first group of cases His probable date of infection was therefore about Aug 20, with a range from Aug 13 to Aug 25 He had, however, been on holiday in Devon from Aug 1 to Aug 31 In addition his wife (case 8), who had not been in the hospital for over a year, had also become ill on Sept 9 with similar signs and symptoms Because of the epidemiological improbabilities involved, the suggestion that these were fresh cases of Q fever was received with considerable scepticism, but a rising titre to *R burneti* in both patients soon justified the provisional clinical diagnosis

The manner in which cases 7 and 8 had contracted Q fever could be explained in one of two ways either they had been infected from the first group of cases by taking some contaminated article from the hospital on holiday with them, or they had been infected from some quite different source unconnected with the first group of cases The only article case 7 could remember taking from the hospital was a cardboard box of tab codeinæ co These had come from a ward unconnected with case 5 or the cases infected from him This left the second possibility Further inquiry revealed that between Aug 15 and Aug 20, cases 7 and 8 had made the acquaintance of a Devon farmer and been guests at his farm D several times They had had meals, including liquid cream, at the farm and had been present at the delivery of a cow named "Tabor Lass" In November we heard from case 7 that case 9, a Devon resident who had also visited the farm and been present at the delivery of "Tabor Lass," was convalescing from atypical pneumonia, which had started on Sept 9 His serum was then examined and found to have a high titre to *R burneti* With the kind assistance of various members of the Devon Epidemiological Society, 14 of the 40 cattle on the farm were bled, and 2 of them were found to have antibodies for *R burneti in low dilution (1/10 and 1/20)* One of the positive cows was "Tabor Lass" Pooled milks collected from the herd on Dec 2 were negative on guineapig inoculation Unfortunately "Tabor Lass" was dry at that time, making it impossible to test her milk

There was therefore a group of 3 cases starting about the same time and presumably infected from the same source It is reasonable to suppose that this source was the farm or possibly some other place in the area where they had spent their holiday If case 7 had been infected at the Royal Cancer Hospital, other cases might have been expected among the staff Suggestive febrile illnesses in two other workers in the institute and in an anæsthetist were investigated and found not to be Q fever Apart from these three persons there was no other illness among the staff at the hospital up to January, 1950

DISCUSSION

The results of the epidemiological investigations just described could be interpreted as showing the spread of infection by devious routes from two farms to members of the staff of the Royal Cancer Hospital However, certain links of this interesting chain of events must be examined more critically

There can be little doubt that the immediate source of infection of the nurse, the two pathologists, and the mortuary attendant was case 5 Whittick's (1950) investigations have shown that the morbid anatomical findings in this patient strongly suggested Q fever The onset of illness in the 4 patients was limited to a period of three days, indicating infection from a common source rather than spread from person to person, and case 5's death and necropsy provide a common factor linking the nurse and the pathologists In addition, persons in the ward and pathological department who had not been closely exposed to case 5 did not contract Q fever

The published accounts of the epidemiology of Q fever emphasise the rarity of infection of nurses and physicians

attendant on cases of Q fever, and in this exception to the rule there were undoubtedly special circumstances The finding by Whittick (1950) of large numbers of rickettsia like organisms in case 5's lung is one that has not previously been described in other cases of Q fever It may be that the presence of such large numbers made the patient more than ordinarily infectious Towards the end of his illness case 5 was incontinent of urine and producing sputum which, owing to his dysphagia, he often regurgitated with his food He was therefore a more "dirty" patient than the Q fever patients of previous studies, drawn from the Army or occupational groups, who had short illnesses, produced little sputum, and, although rickettsiæ might be present in their urine, were not incontinent and could dispose of their urine in a hygienic way

The nurse (case 2) had very close contact with case 5 when she "laid him out," and was the only person in X ward to contract the infection "Laying out" presumably included much handling of bed clothes and pyjamas contaminated with excreta and food in addition to direct contact during the washing of the body Oliphant et al (1949) have shown that rickettsia contaminated laundry can be a source of infection in Q fever

In considering the mode of infection of the pathologists reference must be made to the conventional possibilities of infection via skin abrasions or the conjunctiva, but by analogy with the experience of persons working with infected animal material it is more probable that they were infected by the inhalation of small droplets formed during the removal and cutting of case 5's organs, in particular the lung Sloan (1942) has shown that tubercle bacilli can be recovered from glass plates situated 8 inches away from the lung of tuberculous patients during necropsy The handling of the lung in Sloan's experiments was gentle, no splashing occurred, but crepitation tests were done by gently squeezing the tissue Probably such crepitation tests, or the natural retraction of the lung on cutting, would lead to the expulsion of air containing fine infected droplets The pathologists at case 5's necropsy wore gowns and gloves, and a hose was not used to wash the organs these were however, washed under the tap, with the result that some more obvious splashing must have occurred

The manner in which case 5 was infected is not so clear The incubation period of Q fever is usually taken to be about nineteen days It therefore seems that case 5 was infected very shortly before his admission to hospital. The fact that his wife was serologically positive makes it probable that he was infected while living at home rather than during his journey to hospital One other more remote, possibility must be considered in passing—i e, the accidental aspiration of barium into his lungs during the investigation of his dysphagia shortly after admission (Harman 1949) provoked a change of a latent and more long standing infection with *R burneti* into an acute pneumonia In these circumstances he might have been infected in the more remote past Consultation with his family doctor has not however, revealed any past history of recurrent febrile episodes such as occurs in a minority of cases of Q fever The only environmental source of *R burneti* which was found was the milk supply to case 5 s household, and it is possible that consumption of this milk was responsible for the illness of case 5 and his wife Before the significance of this finding can finally be assessed it is necessary to know something of the incidence of Q fever in those of case 5 s neighbours who were consuming the same milk as compared with those using pasteurised milk from other sources Such investigations are now in progress Stoker (1950) shows that the strain isolated from the pathologist case 1 and presumably acquired from case 5 and another strain (M_1) isolated from case 5 s milk-supply, behave differently in their animal and egg pathogenicity It seems improbable that two human passages would be sufficient to alter the characteristics of the human strain if it had originally come from the milk At least three cows excreting *R burneti* contributed to the pool from which strain M_1 was isolated Perhaps the strain M_1 and the strain infecting case 5 came from different cows Nevertheless the difference between the human and milk strains underlines the need for caution in attributing case 5's infection to his milk supply

In spite of the failure of milk to infect by the gastro intestinal route in experiments on volunteers (Fonseca et al 1949) the evidence that raw milk can be a source of infection is very strong Bell et al (1950), in a brilliant epidemiological study of Q fever in California, showed that the incidence of serological positivity was 10 7% in raw milk drinkers as compared with 0 9% in control groups using only pasteurised milk Whatever the time and source of case 5's infection, it is clear that he came from a place where the disease is endemic, this is proved by the subsequent discovery of other cases of Q fever in the same town, and by the fact that 16% of a sample of 83 blood donors in the town had serological evidence of previous infection

The occurrence of the second group of cases in the Royal Cancer Hospital outbreak (cases 7, 8, and 9) is a remarkable coincidence, because no other cases of Q fever have been found during the examination of sera from more than 300 cases of atypical pneumonia in London The evidence presented must lead to the conclusion, however remarkable, that cases 7 and 8 were not infected from the first group of cases at the Cancer Hospital but in Devon. Attendance at the delivery of the cow "Tabor Lass" may have been the occasion of infection Luoto and Huebner (1950) have shown that placentas from 39% of 33 serologically positive cows contained *R burneti*, as many as 10^8 guineapig infective doses being present in some instances There is no direct evidence that the placenta of "Tabor Lass" was infected, although her serum was positive, but the incident is suggestive The discovery, in collaboration with the Devon Epidemiological Society, of other cases of Q fever in the same part of Devon establishes the county as another endemic area in which cases 7 and 8 could have acquired their infection

The occurrence of a previously unsuspected disease always raises the question whether it is a recent importation Little direct evidence can be brought on this point but it is perhaps worth noting that, in spite of the large numbers of cases which must, on the basis of serological surveys of dairy and farm workers and blood donors have occurred in the endemic areas, practitioners did not feel that there had been any undue incidence of fevers or pneumonias Certainly many cases of Q fever must have been dismissed as 'influenza," "brucellosis," and the like The difficulty of recognising cases of Q fever on clinical grounds alone and their essentially sporadic distribution are adequate reasons for the failure to detect them in the past

SUMMARY

The epidemiological investigation of an outbreak of Q fever at the Royal Cancer Hospital, London, is described

The outbreak comprised two apparently unconnected episodes, the first consisting of four cases in July, 1949, and the second of two cases in September, 1949

In the first episode a nurse, two pathologists, and a mortuary attendant were apparently infected during the terminal illness and at the necropsy of an unrecognised case of Q fever

In the second episode, two months later, another member of the staff and his wife were infected while on holiday in Devon

The fatal case of Q fever came from N E Kent, and the patient may have been infected there by the consumption of raw milk, which was shown to contain *R burneti*

Other investigations, by the detection of more cases of Q fever and the demonstration of antibodies in farm workers and cattle, have shown that parts of Kent and Devon are areas where Q fever is endemic

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THE CAUSATIVE AGENT

M G P STOKER
M D Camb
LECTURER IN PATHOLOGY, UNIVERSITY OF CAMBRIDGE

With illustrations on plate

THE organism which causes Q fever was first described in 1937 by Burnet and Freeman working with a strain isolated in Queensland by Derrick (1937) The agent was shown to possess the general characteristics of a rickettsia and Derrick suggested the name *Rickettsia burneti*

At about the same time Davis and Cox (1938) isolated a similar organism from the tick *Dermacentor andersoni* collected at Nine Mile Creek, Montana, U S.A., and because it passed through filters which normally retained bacteria and other rickettsiæ they named it *Rickettsia diaporica* Subsequently Burnet and Freeman (1939) and Dyer (1939) showed that these two organisms were identical and the name *Rickettsia burneti* was universally adopted Despite its resemblance to other rickettsiæ, *R burneti* possesses some distinguishing features For example, it may pass through filters with an average pore diameter as small as 400 mμ and it remains viable for long periods when stored without refrigeration —probably an important epidemiological feature Philip (1948) has suggested that these differences are at a generic level and has proposed a new name, *Coxiella burneti* (Derrick), for the organism

In the last few years Q fever has been identified, and *R burneti* isolated, in several different countries, thus enabling strains from widely separated geographical areas to be compared Strains originating in Italy, Greece, and Panama, as well as in Australia and the U S.A, were compared by Robbins et al (1946) and Topping et al (1946) These studies showed that there was complete reciprocal cross immunity in guineapigs between the strains studied, but that Mediterranean and Australian strains produced a milder disease than American strains in these animals Complement fixation tests revealed that the sensitivity of antigens made from Mediterranean strains was much higher than those of the American strains Mediterranean strain antigens revealed high antibody titres in sera from any strain, whereas American or Panama strain antigens would not react even with their own homologous antisera unless very high antigen concentrations were used This was of great practical importance, since the Mediterranean strains were obviously preferable for diagnostic antigens and the Henzerling Italian strain was especially suitable in this respect

It appeared, therefore, that strains of *R burneti* could broadly be divided into two groups (1) the American and Panama strains, and (2) the Mediterranean and probably Australian strains The American strain used in these studies, however, was the Dyer strain, and Wolfe and Kornfeld (1949) have since reported that they could detect no antigenic difference between the original American Nine Mile strain isolated from ticks and the Italian Henzerling strain Although no direct comparisons have been reported, it thus seems that these two American strains, Nine Mile and Dyer, are antigenically distinct in that the former resembles the Italian strain and the latter does not (Strauss and Sulkin 1949) This is particularly interesting because the Dyer strain was isolated from an individual supposedly infected with the Nine Mile strain in a laboratory It seems unlikely that these fundamental differences have arisen simply from one human passage of the organism, and it is possible that this individual was actually infected, in the laboratory or elsewhere, with another strain altogether

R burneti was first isolated in Great Britain last year by MacCallum, Marmion, and Stoker (1949), and subsequently several strains have been obtained from raw milk in endemic areas by Marmion and Stoker (1950) This paper reports a laboratory study of the original human (Christie) strain and the first milk strain to be isolated (M1 strain), and a comparison of both with the standard Italian (Henzerling) strain

MATERIALS AND METHODS

Strains of R burneti

The original isolation of the Christie strain from a human case of Q fever has been described elsewhere (MacCallum et al 1949) The other strain (M1) was obtained from a pool of raw milk collected from three farms in north Kent during the epidemiological investigation described by Marmion and Stoker (1950)

Two (previously bled) guineapigs were inoculated intraperitoneally with 4 ml of the milk pool, and both developed fever fifteen days later One guineapig was killed immediately and its heart blood was passed to fresh guineapigs The second guineapig was bled nineteen days after the onset of fever, and it was found to have developed Q fever complement-fixing antibodies An uninoculated guineapig in the same cage developed no fever or antibodies

These indigenous strains of *R burneti* were compared with the Henzerling strain * isolated from a soldier in Italy by Robbins et al (1946) This was chosen because it is the strain most commonly used for antigen preparation, and because it has been studied extensively and compared with other strains from different parts of the world (Topping et al 1946)

Male or female guineapigs weighing 400–500 g were used for most of the animal experiments and were inoculated intraperitoneally Their rectal temperatures were recorded daily and a temperature of over 103 5°F was regarded as abnormal Citrated heart-blood withdrawn on the second or third day of fever was generally used for passage to further guineapigs in 3–4 ml quantities but 10% spleen emulsion was sometimes used instead All mice used were of the Glaxo MM strain

Fertile hens' eggs (White Leghorn) were incubated at 37°C for six days before the inoculation into their yolk sacs

* Kindly supplied by Dr Cox of Lederle Laboratories New York

TABLE I—SUMMARY OF THE BEHAVIOUR OF THREE STRAINS OF *R burneti* IN GUINEAPIGS

Strain	Inoculated with guineapig heart blood or spleen						Inoculated with infected yolk sac				
	Passage nos	No of guineapigs	No developing fever	Mean incubation period (days)	Mean duration of fever (days)	No of deaths	No of guineapigs	No developing fever	Mean incubation period (days)	Mean duration of fever (days)	No of deaths
Christie	2–12	30	27	7 5*	2 0*	1	10	10	3 9	4 7	6
M1	2–12	25	24	5 8*	3 8*	0	6	6	2 6	4 8	5
Henzerling	1–6	20	18	7 7	2 8	0	10	9	3 3	3 4	0

* Standard error of the difference between mean incubation periods of Christie and M1 strains = 0 61 and between mean durations of fever = 0 62

of 0 25 ml quantities of infected material The eggs were subsequently incubated at 35°C, with candling twice daily Deaths occurring in the first three days were probably due to trauma or bacterial contamination and these eggs were discarded Subsequently all moribund or dead eggs were cultured for bacterial infection, the yolk sacs were harvested and impression smears made and fixed in methyl alcohol For passage a 50% suspension of bacteriologically sterile yolk sac was generally used

For preparing tissue suspensions 10% horse-serum broth was used throughout, and infected material was generally stored at −24°C, but seed suspensions consisting of specially selected, heavily infected yolk sacs were kept at −70°C in sealed glass ampoules Routine tests of animal or egg material for bacteriological sterility were made aerobically on blood agar, but sometimes additional cultures were made anaerobically and in 10% CO_2

Smears and sections of infected tissues were stained with Giemsa stain. Early passage yolk sac smears were stained by Macchiavello s technique, but this was found to be less satisfactory than Giemsa stain and was eventually discarded

Owing to the frequency of human laboratory infection with *R burneti*, infected animals were kept in small isolated huts on the roof of the department, another hut served as a small laboratory for manipulation of infected material, where all eggs were harvested inside an enclosed inoculation chamber Laboratory personnel who were likely to visit these huts were inoculated with Q fever vaccine

EXPERIMENTAL STUDY

Behaviour in Animals

Both English strains and the Italian strain of *R burneti* caused a mild febrile illness in guineapigs resembling that described by other workers with this organism The incubation period for the first passage in guineapigs was twenty two days for the Christie strain and fifteen days for the M1 strain, but during subsequent passages it was usually four to ten days The febrile period generally lasted one to five days with temperatures up to 106°F, followed by complete recovery Out of 75 animals used for routine guineapig passage only 1 died spontaneously This had been inoculated with the Christie strain, and although no bacterial cause of death was demonstrated it was not possible to prove that *R burneti* was responsible

Table I summarises guineapig passages 2 to 12 of the Christie and M1 strains and 6 passages of the Henzerling strain It will be noted that over the same passages the mean incubation period for the Christie (human) strain was greater than that for the M1 (milk) strain, and statistical analysis shows that this difference was unlikely to be due to chance. Similarly, there is a significant difference in mean lengths of fever between the Christie and M1 strains, all of which suggests that the M1 strain was slightly more pathogenic for guineapigs than the Christie strain Occasionally inoculated animals did not develop fever, but it was possible to demonstrate that Q fever complement fixing antibodies had developed in these as well as in the febrile guineapigs

In guineapigs killed during or after the febrile period no abnormality could regularly be found except enlargement and increased friability of the spleen No rickettsiæ could be demonstrated in Giemsa stained smears from peritoneum or spleen

Guineapigs inoculated with large numbers of viable organisms of the Christie or M1 strain in suspensions of infected yolk sac developed a more severe illness with a shorter incubation period (one to six days) and longer fever (table I) Although no deaths resulted from inoculation of the Henzerling strain in this way, most of the animals infected with English strains died either at the height of the fever or after the temperature had returned to normal for several days

Post mortem examination after these late deaths revealed the most marked changes There was usually emaciation, an enlarged and friable spleen, congestion and thickening of the peritoneum with a scanty blood stained exudate, and in most instances a patchy consolidation of both lungs Giemsa stained smears from the peritoneum revealed large numbers of extracellular and intracellular rickettsiæ (fig 1) Microscopically there was a perivascular cuffing of small blood vessels by macrophages and lymphocytes, particularly in the lung and liver This change was mainly around the portal vessels in the liver and was sometimes accompanied by a localised periportal necrosis There were occasionally areas of frank mononuclear cell consolidation in the lung, but rickettsiæ could only rarely be seen in Giemsa stained sections The surface of the spleen showed a well marked mononuclear cell exudate, in which intracellular rickettsiæ could be seen in large numbers, but the organisms were also present in macrophages in the substance of the spleen

Mice inoculated with heart blood from guineapigs infected with the Christie strain remained well, but those inoculated with heavily infected yolk sac suspensions died in twelve to fourteen days with peritoneal exudate and enlarged spleens

Growth in the Fertile Hen's Egg

The English strains of *R burneti* resembled most other pathological rickettsiæ in their ability to multiply freely in the yolk sacs of fertile hen's eggs

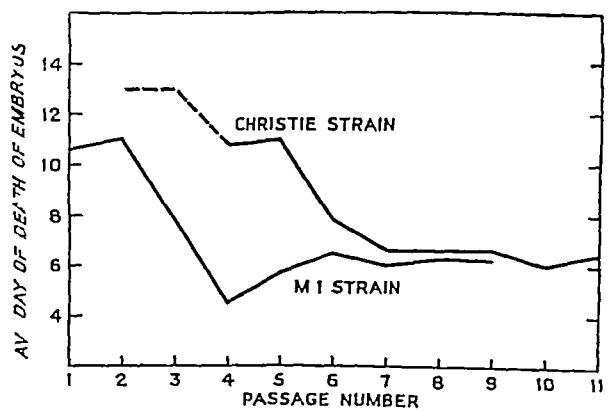

Fig 5—Serial yolk-sac passages of Christie and M1 strains of *R burneti* showing average day of death of embryos at each passage (Passages 2 and 3 of the Christie strain included survivors 14 days after inoculation)

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Two (previously bled) guineapigs were inoculated intraperitoneally with 4 ml of the milk pool, and both developed fever fifteen days later One guineapig was killed immediately and its heart-blood was passed to fresh guineapigs The second guineapig was bled nineteen days after the onset of fever, and it was found to have developed Q fever complement-fixing antibodies An uninoculated guineapig in the same cage developed no fever or antibodies

These indigenous strains of *R burneti* were compared with the Henzerling strain * isolated from a soldier in Italy by Robbins et al (1946) This was chosen because it is the strain most commonly used for antigen preparation, and because it has been studied extensively and compared with other strains from different parts of the world (Topping et al 1946)

Male or female guineapigs weighing 400–500 g were used for most of the animal experiments and were inoculated intraperitoneally Their rectal temperatures were recorded daily and a temperature of over 103 5°F was regarded as abnormal Citrated heart-blood withdrawn on the second or third day of fever was generally used for passage to further guineapigs in 3–4 ml quantities, but 10% spleen emulsion was sometimes used instead All mice used were of the Glaxo MM strain

Fertile hens eggs (White Leghorn) were incubated at 37°C for six days before the inoculation into their yolk sacs

* Kindly supplied by Dr Cox of Lederle Laboratories New York

rickettsiæ, is again centrifuged and treated with cold ether overnight This is followed by repeated ether treatment at room temperature until no interphase is present between the ether and aqueous layers The rickettsiæ in the aqueous layer are finally washed three times by high speed centrifugation and resuspended in 1/15th of the original volume of buffered formol saline This results in a concentrated and highly purified preparation of rickettsiæ

Convalescent serum from Dr A C Christie, from whom the strain was isolated, was used as a standard antiserum, but guineapig antisera were also used Tests with antigen were generally put up in a chessboard fashion

Antigen prepared from the Henzerling strain has been used throughout for routine diagnosis of Q fever and for epidemiological studies Different batches of antigen when titrated with Christie serum produce almost identical antiserum titres and antigen titres varying from 1 40 to 1 160 The optimal antigen concentration is usually 1 10 or 1 20

The first antigens made from the Christie strain (egg passage 6) and the M1 strain (egg passage 4) were rickettsial suspensions which looked microscopically at least as pure and as concentrated as Henzerling strain antigens Despite this they reacted poorly or not at all with Christie antiserum Tests with a Christie strain guineapig serum also showed much higher serum titres with Henzerling than Christie antigen, and at this stage it was thought that the English strains might resemble the Panama or the Dyer American strain which react poorly even with homologous antisera

Further passage of the Christie and M1 strains in yolk sacs, however, eventually yielded rickettsial antigens which did react with Christie antiserum, though the antigen titres were lower than those given by the Henzerling strain Table IV shows the results of a titration of Christie serum in the presence of Henzerling antigen, Christie strain antigen from passages 6 and 11, M1 strain antigen from passages 4 and 5, and an antigen prepared by the same technique from normal yolk sacs (inoculated with 10% horse serum broth) Except for the normal egg antigen, which was completely clear, the suspensions were matched to a standard opacity

TABLE IV—COMPLEMENT FIXATION TESTS WITH DILUTIONS OF HUMAN CONVALESCENT SERUM AND OF VARIOUS Q FEVER ANTIGENS OF COMPARABLE RICKETTSIAL CONCENTRATION

Antigen	Dilutions of antigen 1 in	Dilutions of Christie serum 1 in							
		5	10	20	40	80	160	320	640
Henzerling	undil	++	++	++	++	++	+	−	−
	2 5	++	++	+−	++	+−	++	−	−
	5	++	−+	++	++	++	++	−	−
	10	++	++	++	++	++	++	±	−
	20	++	++	++	++	+	−	−	−
	40	++	++	++	+	±	−	−	−
	80	−	−	−	−	−	−	−	−
Christie—Passage 6	undil	+	−	−	−	−	−	−	−
	2 5	+	−	−	−	−	−	−	−
	5	+	−	−	−	−	−	−	−
	10	±	−	−	−	−	−	−	−
Passage 11	undil	++	++	−+	++	++	−	−	−
	2 5	++	++	++	++	++	++	−	−
	5	++	++	+−	−+	+−	−+	−	−
	10	++	++	++	+	+	±	−	−
	20	−	−	−	++	−	−	−	−
	40	−	−	−	−	−	−	−	−
M1— Passage 4	undil	−	−	−	−	−	−	−	−
	2 5	−	−	−	−	−	−	−	−
	5	−	−	−	−	−	−	−	−
*Passage 5	undil	−+	−+	−+	−	−	−	−	−
	2 5	−+	++	++	+	−	−	−	−
	5	+	+	−	−	−	−	−	−
	10	−	−	−	−	−	−	−	−
Normal Egg	2 5	−	−	−	−	−	−	−	−

* Not in same series

and checked microscopically so that they contained approximately equal numbers of rickettsiæ

The Christie antiserum reacted to 1 160 with the heterologous Henzerling antigen, but only to 1 5 with the homologous Christie antigen made from the 6th yolk-sac passage After a further five passages in eggs, however, Christie antigen produced the same antiserum titres as the Henzerling antigen, though the antigen titre was only 1 10, compared to a Henzerling antigen titre of 1 40 Fourth-passage M1 strain antigen did not react at all with Christie serum, but 5th passage antigen (not in the same egg-passage series) reacted at low antigen and antiserum dilutions

It is possible that, despite precautions, the English strains became contaminated by the Henzerling strain during yolk sac passage. This explanation is unlikely because the mean day of death of the adapted English strains remained at six to seven days, whereas under similar conditions the Henzerling strain generally killed the embryos in about four days

These titrations were all put up together and the earlier passage antigens had therefore been stored at 2°C for longer than the antigens made from later passages The early passage antigens, however, had also been tested immediately after preparation with the same negative results There was no apparent difference in morphology or numbers of rickettsiæ seen in Giemsa stained smears of the original yolk sacs or of purified antigens from either early or late passage

Assuming that the rickettsial suspensions were of approximately equal concentration and purity, the results suggests that there was some change in antigenic structure during passage of the English strains in eggs, with the result that the sensitivity of the antigens was greater after increasing egg adaptation

DISCUSSION

Under laboratory conditions the two strains of rickettsiæ isolated in England closely resemble other known strains of *R burnetii*, and in particular the Henzerling Italian strain They caused a typical febrile illness in guineapigs, with development of specific antibodies and animals which had previously been infected with either of the English strains were immune to the classical Henzerling strain, and vice versa The rickettsiæ grew freely in the yolk sac of fertile eggs, and no difference in morphology or size between strains could be detected even by electron microscopy The Christie strain was found to pass through gradacol membranes with an average pore diameter of 400 mμ, a feature which differentiates *R burnetii* from other pathogenic rickettsiæ

During normal passage the illness caused by English strains in guineapigs was very mild and resembled that caused by the Henzerling strain, so that in this respect they probably differ from the American strains When heavily infected yolk sac suspensions were inoculated intraperitoneally, however, the English strains often killed the guineapigs while those inoculated with the Henzerling strain survived The English strains also differed from the Henzerling strain in their lethal effect on eggs Even after eleven passages the Christie strain took an average of six to seven days to kill embryos, whereas the Henzerling always took four to five days This was probably due to the much longer period of laboratory adaptation which the Henzerling strain had undergone

A further difference between the English and Henzerling strains associated with egg adaptation was their behaviour as complement fixing antigens Despite the presence of large numbers of rickettsiæ, purified antigens from early passages of the English strains failed to react with homologous human antiserum except in very low dilutions, though the Henzerling antigen reacted to high

Yolk sac passage of the Christie strain was started at the Central Public Health Laboratory, Colindale, London, from first passage guineapig spleen and was continued in Cambridge from a yolk sac of the first egg passage at Colindale Cultivation of the M1 strain in yolk sacs was started by inoculation of a 10% spleen suspension from the 5th guineapig passage of this strain

The Henzerling strain was reconstituted from a lyophilised suspension of infected yolk sac and inoculated directly into eggs

During the early passages of the Christie strain at Cambridge (2nd and 3rd egg passage) most of the eggs survived After the 4th egg passage, however, all inoculated eggs died, and the interval between inoculation and death was gradually reduced until after the 6th passage when the average remained at six to seven days after inoculation of 50% yolk sac suspension (fig 5)

Egg adaptation of the M1 strain was more rapid, and even in the early passages all the eggs died The average day of death fell to four days in the 3rd passage, but thereafter remained like the Christie strain at six to seven days Under similar conditions the Henzerling strain, already adapted to growth in eggs, usually killed the embryos four to five days after inoculation

Very large numbers of rickettsiæ were visible in Giemsa stained smears from the 2nd passage of the M1 strain and the 5th passage of the Christie strain These organisms were almost entirely extracellular and they resembled rickettsiæ seen in stained smears of the Henzerling strain, but in smears of English strains there was a greater tendency to aggregate into clumps These clumps were of varying sizes and usually unattached to host cells, though the organisms may have been lying in pieces of cytoplasm which had broken away from disintegrating and heavily infected cells The degree of clumping varied from egg to egg through all passages of the English strains but was more noticeable than with the Henzerling strain

Size of the Organism

The size of the Christie strain organisms was estimated by filtration and by direct measurement of particles photographed with an electron microscope

Three batches of a 2% suspension of heavily infected yolk sac were passed through gradacol membranes with average pore diameters of 640 mμ, 400 mμ, and 190 mμ Into each of 4 guineapigs, from which a sample of blood had previously been taken, 2 5 ml of each filtrate was

TABLE II—RESULTS OF FILTRATION OF CHRISTIE STRAIN OF *R burneti*

Average pore diameter of filter	Guineapig nos	Complement fixing titre with Q fever antigen	
		Before inoculn	After inoculn
190 mμ	2029 30 31 32	All < 1 5	All < 1 5
400 mμ	33 34 35 36	All < 1 5	All > 1 20
640 mμ	37 38 39 40	All < 1 5	All died of Q fever

inoculated intraperitoneally Two weeks later all the guineapigs which had been inoculated with the 640 mμ filtrate died Large numbers of rickettsiæ were present in peritoneal smears, no bacteria could be isolated from the spleens, and it was assumed that these animals had died of Q fever The remaining guineapigs were bled a month after inoculation, and both pre inoculation and post inoculation specimens of sérum were examined for Q fever complement fixing antibodies (see table II) None of the guineapigs inoculated with the 190 mμ filtrate had serological evidence of infection, but all those inoculated with the 400 mμ filtrate had developed antibodies since inoculation

The organism therefore passed a 400 mμ filter, and this implies that some infective particles had a diameter of less than about 300 mμ

Direct measurements by electron microscopy were made on purified suspensions of rickettsiæ which were to be used as antigens Figs 2, 3, and 4 (on plate) show gold shadowed organisms of the Christie and Henzerling strains The strains resemble one another closely and have the typical structure of rickettsiæ as seen under the electron microscope They are mostly cocco bacillary in form with an irregular central core surrounded by a flat apparently collapsed zone and a well marked limiting membrane Fig 4, with the greatest magnification, shows one organism whose central portion seems to consist of a twisted thread like structure

TABLE III—RESULTS OF CROSS IMMUNITY TESTS WITH THREE STRAINS OF *R burneti* IN GUINEAPIGS FIGURES INDICATE DURATION OF FEVER IN DAYS FOR INDIVIDUAL ANIMALS

Challenging strain	Duration of fever			
	Normal guineapigs	Guineapigs previously infected with—		
		Christie	M1	Henzerling
Christie	2 3 3, 5 7 7 7 7		0 0 0, 0, 0	0 0 0
M 1	4 4 5 5 7	0 0 0 0 0 0		0 0
Henzerling	2 2, 3	0, 0 0	0, 0 1	

Eighteen Henzerling and eleven Christie strain organisms were measured The mean for the Henzerling strain was 600 mμ × 210 mμ, and for the Christie strain 600 mμ × 200 mμ, so there was no significant difference in the mean sizes of the two strains, though there was considerable individual variation in size and shape in both strains

SEROLOGICAL TESTS

Cross immunity Tests

Cross immunity tests between the three strains were carried out in groups of guineapigs which had been infected with *R burneti* during the routine passage of the strains At various times these guineapigs had all shown a typical febrile response after the primary inoculation Two to eight weeks later they were challenged by intraperitoneal inoculation of the heterologous strains, 2 ml of 1 1000 yolk sac suspension of each strain was used for the principal experiment, but in a preliminary test 2 ml of infected guineapig heart blood was the inoculum Re inoculation with the homologous strains was not performed Guineapigs with no previous exposure to *R burneti* were inoculated as controls The rectal temperatures were recorded for three weeks and it was assumed that a temperature of over 103 5°F occurring more than two days after inoculation indicated infection

The duration of fever in days is recorded in table III It will be seen that all the normal guineapigs developed fever lasting two to seven days The immunised guineapigs remained afebrile during the whole three weeks, except for 1 animal previously infected with the M1 strain which developed fever ten days after re inoculation with Henzerling strain With this exception there was complete reciprocal cross immunity between the three strains

Complement fixation Tests

As soon as the English strains of *R burneti* were sufficiently adapted to growth in fertile eggs, antigens were prepared from formolised suspensions of heavily infected yolk sacs The rickettsial suspensions were purified by a modification of Topping's technique used by Wolfe and Kornfeld (1949)

This consists of high speed centrifugation of 20% yolk sac suspension and overnight cold ether extraction of the resuspended deposit The aqueous phase, which contains the

transurethrally with the evacuator The other 2 required cystotomy, and 1 of these subsequently died of uræmia despite intensive treatment

Convalescence in several cases was delayed by suprapubic leakage but was invariably overcome by inserting an indwelling catheter for a few days Serious wound infection with persistent fistula was not encountered

Incontinence for a short time was common but it persisted in only 2 cases

In 1 case it was impossible to find a plane of cleavage at operation When the prostate gland was eventually enucleated, a portion of the prostate membranous urethra was seen to have been avulsed with the gland mass The technical difficulties of the operation were subsequently explained by the histological report, which revealed malignancy

The other case of persistent incontinence was in a man, aged 65, with simple hypertrophy Periodic instrumentation had no beneficial effect, and five months later he was readmitted and underwent transurethral resection of residual tags However, this was only partially effective, and he still has recourse to a penile clamp

The prostate was examined histologically in all cases 5 proved malignant, and 1 was equivocal. Clinical examination in these 5 patients had never aroused more than a suspicion of malignancy, so the incidence of latent carcinoma was 8% But this is rather less than in some of the published series

The average length of stay in hospital was twenty one days, but this does not do justice to the method, since this figure includes patients whose stay was prolonged by factors which would have operated against them whatever the method of therapy For instance, one developed acute retention after the plating of a fractured tibia, another had multiple vesical calculi, and several were retained because of concomitant respiratory disease Moreover, the patients' relatives could not always be persuaded to welcome them home as soon as the wound was healed Most of them were fit for discharge in twelve to sixteen days

MORTALITY

Of the 60 patients treated in this way during twelve months, 4 died, giving a mortality rate of 6 7% One man, aged 74, died within a few hours of operation apparently from shock, necropsy revealed bilateral hydronephrosis and pyelonephritis Another death occurred from pulmonary embolism in a man aged 75 who had been catheterised intermittently for three days before admission A third death, due to uræmia following clot retention, occurred on the thirteenth postoperative day in a man aged 67 The fourth death was due to postoperative bronchopneumonia in a man aged 81

CONCLUSION

A mortality rate of nearly 7% may be regarded as too high to justify this method of treatment However, with one exception all the deaths were in men considerably over the age of 70 Moreover it should be possible to reduce the death rate somewhat as the selection of cases becomes more familiar, only 1 death occurred in the last 32 of the series

The relatively high incidence of clot retention is possibly related to the engorgement of the prostate gland consequent on the advent of acute retention

The considerable reduction in length of stay in hospital seems to justify extended trial of immediate operation

My thanks are due to Mr A. W Adams director of the genito urinary department, United Bristol Hospitals who has had charge of the cases described and performed most of the operations

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RESISTANCE TO CHLORAMPHENICOL DEVELOPING DURING TREATMENT OF TYPHOID FEVER

J COLQUHOUN
M B Sheff
BACTERIOLOGIST

R S WEETCH
M B Glasg, M.R C.P
MEDICAL FIRST ASSISTANT

ROYAL INFIRMARY, SHEFFIELD

MOST of the published reports on the treatment of typhoid fever with chloramphenicol describe relapses, but none of them seems to have demonstrated an increased drug resistance of the organisms during the relapse Indeed, Good and Mackenzie (1950) and Rankin and Grimble (1950) showed in their cases that the sensitivity to chloramphenicol remained the same in cultures obtained before, during, and after treatment and relapse

We report here a case of typhoid fever which relapsed during treatment with chloramphenicol and in which increased drug resistance of the infecting organism was established.

CASE-RECORDS

A married male nurse, aged 43, who had never received T.A.B inoculation, was admitted to the Royal Infirmary, Sheffield, on Feb 27, 1950 with two weeks history of malaise followed by persistent fever, rigors, pains in the knee joints, and occipital and retro orbital headache His appetite had been poor, and his bowels, normally regular, had been constipated for a week. In the two weeks before admission he had received courses of sodium salicylate and sulphadimidine ('Sulphamezathine') without any improvement

On admission his temperature was 104 2°F, pulse rate 98, and respirations 20 per minute He was haggard, ill, faintly cyanosed, resistant, and uncoöperative and resented questioning and examination No rash was present, the tongue was moist and moderately furred The heart was not enlarged and the heart sounds were pure The blood pressure was 124/72 mm Hg The activity of the alæ nasi was obvious, but no abnormal signs were present in the lungs The abdomen was not tender or distended, and the spleen was not palpably enlarged No abnormality was detected on rectal examination

Investigations—Blood count on day of admission Hb 15 5 g per 100 ml (105%), red cells 4,970,000 per c mm, and white cells 4000 per c.mm (polymorphs 51% lymphocytes 41%, monocytes 6%, eosinophils 2%) Erythrocyte sedimentation rate (E.S.R) 6 mm in 1 hr (Wintrobe))

Urine trace of albumin, sterile on culture

Radiography of chest only "increased lung markings" at right base

Blood agglutinations (Feb 28) *Salmonella typhi* O, 1/320, H, 1/1280 Vi 1/60

Blood culture (Feb 28) pure growth of *S typhi*

Fæces (March 1) a heavy growth of *S typhi* sensitive to 12 μg of chloramphenicol per ml

Treatment and Progress—In the interval of two days between collection of the blood samples and establishment of the diagnosis, penicillin was given intramuscularly in full doses without any improvement On March 1 rose spots appeared on the patient's abdomen His fever persisted, he began to pass frequent liquid stools, and his general condition deteriorated

Chloramphenicol was started on March 2, 2 g being given in the first two hours and then 0 5 g four hourly

On March 3 the patient was cold and collapsed, blood pressure 100/60 mm Hg He became increasingly confused and uncoöperative and drip feeding by indwelling gastric tube was instituted because he refused to drink and would not swallow tablets Definite signs of consolidation now developed at the right lung base, and radiography confirmed the presence of right basal pneumonia Pyrexia continued, and on March 7 the chloramphenicol was increased to 4 g daily Blood culture was negative for *S typhi* on this date

In the next few days the patient's temperature fell steadily, and by March 10 eight days after the start of chloramphenicol though he was still readily dyspnœic, he could take solids and fluids by mouth and his temperature was normal for the first time since admission On March 12 the dosage of

titre When antigens of similar rickettsial concentration were made from later passages of English strains, they reacted satisfactorily with homologous antiserum It is possible that egg adaptation brought about a change in antigenic structure characterised by increased sensitivity as complement fixing antigens This might be of practical importance because the preparation of satisfactory antigens would depend on egg adaptation considerably past the passages where large numbers of rickettsiæ were first visible in stained smears Judging by antigens prepared at this stage the English strains resembled the Dyer Panama low sensitivity group of Topping et al (1946), but after further passage the increased sensitivity made this supposition untenable

A difference between the two English strains themselves was in adaptation to growth in yolk sacs This was much more rapidly achieved by the M1 strain from milk than by the Christie human strain, but this might have been due to the greater number of guineapig passages undergone by the M1 strain before transfer to eggs Judging by the shorter incubation period and longer fever, the M1 strain was also slightly more pathogenic for guinea pigs These differences, between two strains only, may not be significant, but Dr E H Lennette informs me in a personal communication (1950) that he and his group in California have also found that strains of *R burneti* isolated from milk adapt more easily to yolk sac and guineapig than strains from humans or ticks

These minor strain characteristics of *R burneti* isolated in Britain do not give any clear indication of a closer relationship to either European or American strains In fact, the known characteristics of different strains of *R Burneti* are probably too indefinite to permit such an identification

SUMMARY

Two strains of *R burneti* isolated in Great Britain have been studied under laboratory conditions The Christie strain was obtained from a patient and the M1 strain from a pool of raw milk collected in an endemic area These strains have been compared with the classical Henzerling strain isolated from a patient in Italy

In their morphology, size, and general behaviour in guineapigs and fertile hen's eggs the British strains resembled the classical strain There was also reciprocal cross immunity between all three strains in guineapigs

Minor differences between the strains were detected Judging by incubation period and length of fever, the British milk strain was more pathogenic for guineapigs and also adapted itself more rapidly to growth in fertile eggs than the human strain Even after adaptation to eggs, however, the British strains took longer to kill the embryos than the classical strain

Complement fixation tests showed that antigens made from the classical strain reacted with antisera against British strains These British antisera, however, would not react with antigens made from either British strain until the strains had undergone several yolk sac passages This effect was not related to the numbers of rickettsiæ in the antigens and suggested a change in antigenic structure during egg adaptation

Thanks are due to Dr V E Coslett and Mr R Horn for the electron microscopy, and to Miss Z Page for valuable technical assistance

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IMMEDIATE RETROPUBIC PROSTATECTOMY IN ACUTE RETENTION

FRANK R HURFORD
M B Brist, F.R C S
LATE GENITO URINARY REGISTRAR, UNITED BRISTOL HOSPITALS

IMMEDIATE prostatectomy for acute retention of urine has been extensively practised by Wells and others, using the Wilson Hey technique of suprapubic dissection with excision of the trigone In selected cases the retropubic method can also be used with satisfactory results, as advocated by Walters (1949)

In the present series not all the patients with acute retention of prostatic origin underwent retropubic prostatectomy The small fibrotic gland and the obviously malignant case were dealt with by transurethral resection Adequate general physical capacity, assessed more from the patient's recent history than by any special clinical tests, was also an essential prerequisite Provided the patient was still ambulant and active up to the onset of retention, operation was not necessarily refused because of chronic bronchitis or signs of cardio vascular degeneration The blood urea was estimated in all the cases Generally a figure over 100 mg per 100 ml was taken as a contra indication to immediate prostatectomy, but a few cases were operated on successfully with blood ureas considerably higher than this Patients with obvious urethritis due to repeated catheterisations before admission were not subjected to immediate prostatectomy Using these criteria the operation was performed in about 70% of all patients admitted with acute retention of prostatic origin Age in itself was no contra indication, the oldest patient being 83

PREOPERATIVE MANAGEMENT

When the patient was in great discomfort, a suprapubic spinal needle was inserted on admission, but there may be considerable extravasation of urine into the retropubic space if operation is not done within a few hours

Latterly all the patients received streptomycin, the first dose of 0 5 g being given an hour before operation, as advocated by Wilson Hey All of them had their blood grouped, but none received transfusion or infusion before operation, and only a minority needed transfusion after it

OPERATIVE TECHNIQUE

Nearly all the operations were performed under a minimum cover of spinal anæsthesia Preliminary cystoscopy was routine to exclude stricture, stone, diverticulum, &c The transverse suprapubic incision was preferred In most cases after dissection of the prostate gland and v excision of the bladder neck a no 4 rubber catheter was led from the prostatic bed through the fundus of the bladder on to the abdominal wall, as described by Adams (1949) With the Harris catheter in situ the small transvesical catheter can be used to maintain a constant drip washout of citrate and later saline solution during the first twenty four hours after operation Later a similar safeguard against clot retention was achieved by threading a no 14 F ureteric catheter along the lumen of the Harris catheter, thereby obviating the small transvesical tube

COMPLICATIONS

The postoperative course was usually smooth, but clot retention, suprapubic leakage, and postoperative incontinence were all encountered

Of the 60 patients treated by retropubic prostatectomy clot retention occurred in 4 In 2 it was overcome

Further, in all the reported cases of typhoid fever treated with chloramphenicol the organisms continued to be excreted in the fæces during treatment although apparently adequate blood-chloramphenicol levels were being maintained The work of Glazko et al. (1949) may possibly explain this finding They have shown by chemical methods that 80–92% of the chloramphenicol ingested is excreted in the urine, though only 5% is in a biologically active form On this evidence, effective concentrations of the antibiotic may not be obtained in the bowel, since only 8–20% of the total dosage is left to be excreted in the fæces The current dosage of chloramphenicol probably produces a sufficient blood-level to kill organisms in the intestinal wall via the blood stream But organisms that are imbedded in debris and necrotic material, or in the contents of the gut, may be bathed in a solution of chloramphenicol whose concentration is below their sensitivity level so that the more resistant organisms will continue to multiply and may later reinvade the tissue and produce a relapse The use of an unabsorbable form of chloramphenicol, or its administration in enteric coated capsules as a supplement to the present treatment might therefore be more effective in clearing the intestine of the organisms and might help to prevent relapse and the development of the chronic carrier state

SUMMARY

In a case of typhoid fever successfully treated with chloramphenicol the initial sensitivity of the infecting organisms (12 μg per ml.) was higher than any so far reported

During a relapse *S typhi* isolated by blood-culture and from the fæces showed increased resistance to chloramphenicol (35 μg per ml.)

A possible explanation for the relapse is put forward and it is suggested that the usual chloramphenicol therapy should be supplemented by the concurrent administration of an unabsorbable form of the antibiotic

We wish to thank Dr A. W D Leishman, under whose care the patient was admitted, for permission to publish, Profs E J Wayne and C P Beattie for helpful advice and criticisms Mr A. S Foster medical artist of the Royal Infirmary, Sheffield, for preparing the chart, and the technicians of the department of bacteriology, Royal Infirmary, Sheffield.

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FLAME PHOTOMETRY

A. G SPENCER
G.M., M.D Lond M.R C.P
ASSISTANT, MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, LONDON

THE solubility of sodium and potassium salts makes their estimation by chemical means both slow and uncertain so that by the time the results are known they have often lost much of their value The clinical application of the rapid and accurate methods of flame photometry has therefore proved of great advantage in the diagnosis and treatment of metabolic disorders in medicine, pædiatrics, and surgery Flame photometry determines the concentration of certain metallic elements by the photo electric measurement of the intensity of their characteristic emission spectra, produced when dilute solutions of their salts are sprayed at a constant rate into a standard flame By this method several determinations can be made in a few minutes with greater accuracy than can be obtained in as many hours by standard chemical techniques

Balance studies of diabetic acidosis (Atchley et al 1933), gastro-enteritis in infants (Butler et al 1933), starvation (Benedict 1915), and the complex biochemical disorders that may follow surgery (Berry et al 1948), have led to a better understanding of the gross intracellular deficits of protein, potassium, and phosphate which accompany so many clinical conditions of severe dehydration Recovery is best aided by the controlled administration of solutions designed to restore simultaneously the acid-base balance, the extracellular losses, and the more easily replaced portion of the intracellular deficits (Butler and Talbot 1944) These three processes of recovery are inseparable Such treatment requires a more precise knowledge of the total metabolic disorder than can be obtained from single electrolyte estimations on the urine and plasma

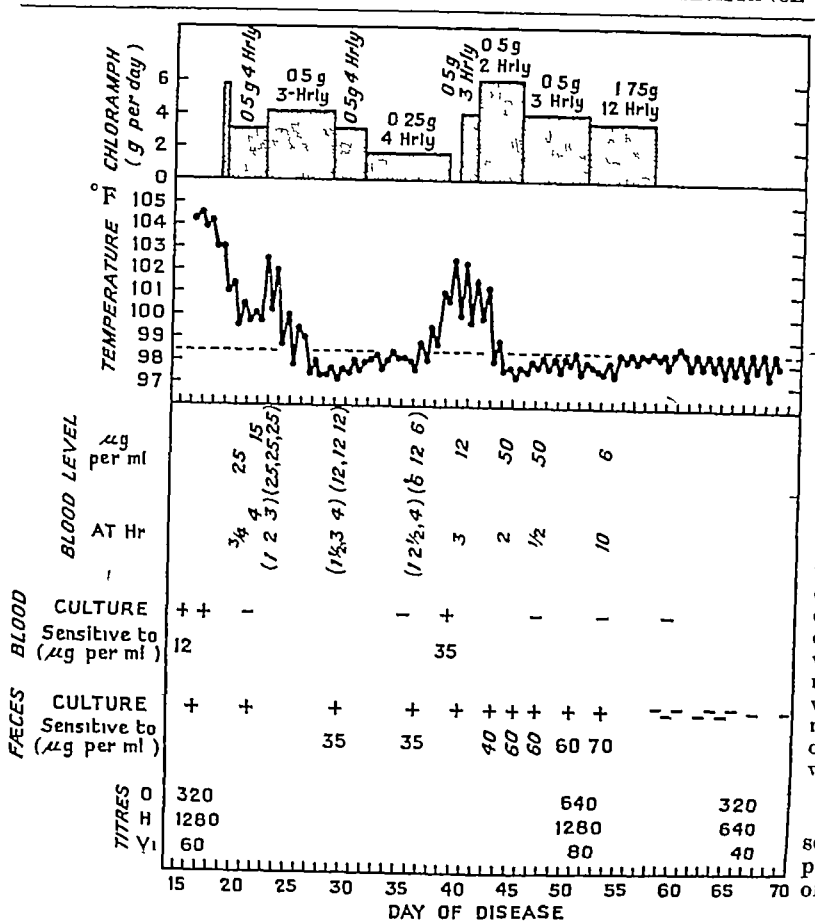
Chloride determinations on the urine are sometimes valuable guides to diagnosis and treatment (Marriott 1947), but they do not necessarily reflect the balance of chloride and sodium in the body Patients with Addison's disease (Loeb 1932, 1933) or with salt-losing nephritis (Peters and Wakeman 1929) become depleted of extracellular fluid by the uncontrolled loss of water, sodium, and chloride in the urine Again, when there is excessive katabolism, as in acidosis or following surgical operations, the patient may continue to lose chloride, sodium, phosphate, and potassium in the urine even when seriously depleted of all those electrolytes Thus, in some metabolic disorders, chloride appears in the urine of salt depleted patients The opposite phenomenon of low urinary chlorides associated with an excess of salt in the body is widely recognised in established congestive heart failure, but it is also sometimes discovered before failure is apparent Fatal pulmonary œdema may follow if the low urinary chloride is interpreted as evidence of salt depletion and saline is given intravenously In the treatment of diarrhœa and vomiting of infancy it is especially important to remember that in very early life the kidneys are unable to form a urine containing a high concentration of chloride (McCance and Young 1941)

Single estimations of electrolytes in the plasma are of limited value, for they do not indicate the balance of electrolytes in the body This is especially true of the plasma potassium, which may be raised in patients whose cells are depleted of potassium—for example, in untreated diabetic acidosis (Martin and Werkman 1947, Nadler et al. 1948) Furthermore, when dehydration and hæmoconcentration are severe, particularly in infancy, high values may be found for the plasma electrolytes, in face of a general bodily deficit

For the precise diagnosis and controlled treatment of disturbances of the body fluids, a series of electrolyte estimations on the plasma and on all materials entering and leaving the body is essential to determine the biochemical patterns of disorder and recovery These are the requirements of metabolic research. Experience gained from such detailed metabolic studies is invaluable to the clinician in the biochemical assessment, and more routine treatment of patients when less data are available It is neither possible nor necessary to make these intensive studies on every patient But when intracellular losses are to be replaced by the intravenous administration of complex solutions containing potassium, careful electrolyte estimations are highly desirable

The flame photometer meets this need for rapid and accurate determinations of sodium and potassium The method has, however, many possible sources of error which may not be widely known If undetected, these entirely invalidate the results obtained and may cause the instrument to fall into disrepute Such errors can be avoided if proper precautions are taken in the design and operation of the photometer

The following account of the principles, construction, and operation of a flame photometer is based on personal



Dosage, temperature, blood levels at various times after doses and sensitivity of organism, showing increasing resistance to chloramphenicol

chloramphenicol was reduced to 3 g daily, and three days later to 1 5 g daily, because the patient had vomited several times

On March 17 he complained of a sore tongue, and it was red and raw, with some angular cheilosis Marmite' was added to his diet and this condition quickly cleared By the 18th his diarrhœa had given place to constipation, and glycerin suppositories were required His clinical condition was now excellent He had been afebrile for nine days, the physical signs in his chest were resolving satisfactorily, and on March 20 a blood culture was negative though the fæces still grew *S typhi*

Chloramphenicol was stopped at 8 P M on March 22, though at 6 P M the patient s temperature had risen to 101°F Next day it was 103 4°, and he had mild abdominal discomfort but the only abnormal findings were minimal generalised tenderness and a doubtfully positive Murphy s sign, and his general condition seemed satisfactory Blood cultures were positive for *S typhi* on this day and the next (March 23 and 24) Chloramphenicol was therefore restarted on the evening of the 23rd, in doses of 3 g daily, and it was increased to 6 g daily on the 25th after a bacteriological report of the increased resistance of the organism to the drug from 12 to 35 µg per ml had been received The patient's fæces continued to grow *S typhi* as they had since admission His fever settled promptly after the reinstitution of chloramphenicol therapy, and by March 28 he was again apyrexial On this day a specimen of sputum was for the first time sent for laboratory examination, no *S typhi* was found There were now no abnormal physical signs in the chest or abdomen, and the chloramphenicol was reduced to 4 g daily, and seven days later to 3 5 g daily and continued in this dose until April 11 (fifteen days after the relapse) when it was discontinued

S typhi was present in the fæces until April 6 (the fifty second day of disease), when in spite of its increased drug resistance (see below) the organism disappeared from the stools and remained absent from eight successive daily specimens The patient was now convalescent He felt well, and radiography of his chest on April 24 showed complete resolution of the pneumonic lesion He was discharged from hospital on April 27

BACTERIOLOGY

Methods —The *S typhi* isolated by blood culture was sent to Dr A Felix, F R S, of the Central Enteric Reference Laboratory and Bureau, who reported that the organism belonged to an untypable Vi strain

The sensitivity of the various cultures was estimated by inoculating dilutions of standard chloramphenicol in phenol red glucose serum water (May et al 1947) with the organism under test The chloramphenicol assays were made by comparing serial dilutions of the test serum and of standard chloramphenicol in the above mentioned medium inoculated with *B cereus* (Lederle no 5)

In the Widal tests the *S typhi* H antibody was estimated by Drever's technique, the *S typhi* O by the Felix technique, and the *S typhi* Vi by the technique recommended by the Standards Laboratory, Colindale

Progress —During the first thirty days of the man's illness a heavy growth of *S typhi* was obtained from his fæces even by direct plating on MacConkey s medium On the thirty sixth day, a moderate growth of the infecting organism was obtained by the use of desoxycholate medium From the thirty ninth day, *S typhi* was isolated only with the aid of 'Selenite F' medium, and the fæces yielded very few colonies on the last three occasions when the organism was isolated

DISCUSSION

The case reported here is interesting from several points of view and raises further problems in the chloramphenicol treatment of typhoid fever

In the first place, the organism isolated before treatment was sensitive to 12 µg and resistant to 10 µg per ml —a much higher resistance than any yet reported, so far as we can determine Thus Edge (1950) found that all the tested organisms in his cases were sensitive to 2 5 µg and resistant to 1 5 µg per ml Secondly, increased resistance to chloramphenicol was first shown, by the organism isolated from the fæces on March 14—nine days before the relapse When the relapse occurred the patient was virtually still under treatment, since chloramphenicol was stopped for less than twenty four hours, and indeed the man's temperature started to rise two hours before the last dose was given Further, positive blood cultures were obtained from samples collected on the second and third days of the relapse The second of these samples contained 12 µg of chloramphenicol per ml, and the resistance of the organisms isolated from these two cultures had increased to 35 µg per ml.

In the published reports on the treatment of typhoid fever with chloramphenicol there has been no suggestion that drug resistance played any part in the failure of treatment or in the occurrence of relapses Yet the present case suggests that some relapses may be due to acquired resistance, and that strains of *S typhi* may be encountered which require very large doses of chloramphenicol for successful treatment Hence in our view, the sensitivity of the organism and the serum chloramphenicol level should be estimated in every case as a guide to dosage, and where this is impracticable the dosage should be that calculated to produce a serum level of not less than 50 µg per ml —i e, 4–6 g daily

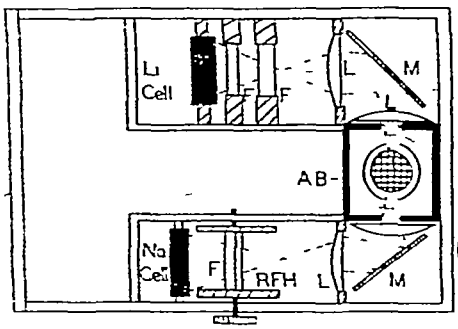
Chronic typhoid carrier states following chloramphenicol therapy have recently been reported (Douglas 1950, Good and Mackenzie 1950) In view of the increased resistance of the organism in our case, it seems that patients who become chronic typhoid carriers after chloramphenicol treatment may be excreting an organism with a greatly heightened resistance to the drug

when the pressure is 15 lb per sq in The rate of atomisation is largely governed by the air pressure, which is readily controlled. Some types of atomiser with gravity or capillary feeds produce coarse droplets at very inconstant rates (fig 2) The compressed air, which must be free of oil and dust, is delivered to the atomiser through an adjustable constant-pressure valve connected to a pressure gauge registering from 0 to 20 lb per sq in

The spray passes directly into a glass or plastic chamber (SC in fig 3b), designed to eliminate any coarse droplets, which condense and leave the instrument through the constant-pressure trap (T) The compressed air, now containing only very fine droplets, passes from the spray chamber through a short wide tube into a narrow metal preheating cylinder (SC2) which surrounds the burner (B) It is essential that the spray should enter this cylinder tangentially and at a level above the air holes in the burner, otherwise the flame will be blown out

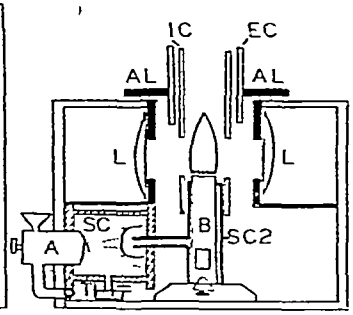
A flame supplying a constant amount of energy is obtained by using a large Fisher-type burner, with adjustable gas-jet and a fine mesh nickel grid The supply of gas is controlled in the same way as the compressed air As a rule coal gas, at a pressure of 7 cm of water, is used, but butane or acetylene (pressure 7 lb per sq in) may be used with the appropriate burners Coal gas is satisfactory for the estimation of sodium and potassium, provided that it burns with a colourless flame and the mains pressure is high and relatively constant The flame is protected from cold air by two concentric metal chimneys (IC and EC) and by a larger asbestos fire box (AB) Narrow windows permit light from the central zone of the flame to pass out into the optical systems, but exclude light from the top, base, and edges of the flame This system of flame protection and ventilation keeps the flame hot and steady and the rest of the photometer cool This cooling effect is important because the output from selenium photo electric cells varies widely with temperature changes In this instrument a dial thermometer monitoring the air immediately around the photocells records temperature variations which are consistently less than 2°C If temperature control is less precise, an electric heater with thermostatic control should be installed

The double optical systems of mirrors (M in fig 3), condensing lenses (L), and filters (F) are arranged to focus light of selected wave length on to the photocells Final adjustment is determined by trial to obtain the maximum galvanometer deflection with a given test solution. The whole of the optical system must be light tight and coated internally with jet-black paint



(a)

Fig 3a—Plan of flame photometer with top removed
AB = Asbestos fire-box.
M = Front-surfaced mirror
L = Heat resisting Fresnell lenses.
F = Filter
RFH = Rotatory filter holder
Li Cell = Photo-electric cell for lithium
Na Cell = Photo-electric cell for sodium and potassium



(b)

Fig 3b—Side view of photometer with end removed
A = Atomiser
SC = Plastic spray chamber
T = Constant pressure trap
B = Fisher burner with nickel grid.
SC2 = Preheating chamber
L = Fresnell lenses.
EC = External chimney
IC = Internal chimney
AL = Asbestos louvres.

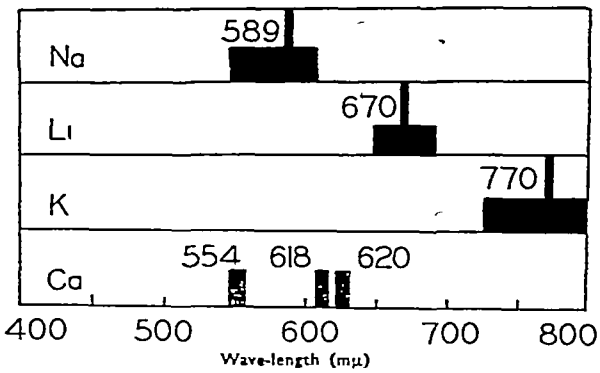


Fig 4—Relation of emission spectra to transmission of filters

Combinations of thick glass filters select the regions of the spectrum emitted by sodium, potassium, and lithium Along one optical path the filters for lithium are kept constant On the other side the filters for sodium and for potassium are mounted on a drum (RFH), which is turned to select the required filter combination An iris diaphragm is incorporated along the light path for sodium To exclude sodium light from the photocells when potassium or lithium spectra are to be measured, a special interference or cut out filter is used It is essential to make detailed spectro photometric tests on the completed instrument to ensure that the spectrum given by any one element is completely removed by the filters used during estimations of the other elements This requirement is met in the photometer described, except that calcium emits a number of bands which are passed to a small extent by the filters used in estimating sodium (fig 4) The resulting error is so small that it can only be detected when the concentration of calcium in the solution under test is more than ten times that of sodium Interference filters provide a very precise method of spectral selection and also have the advantage of transmitting more light

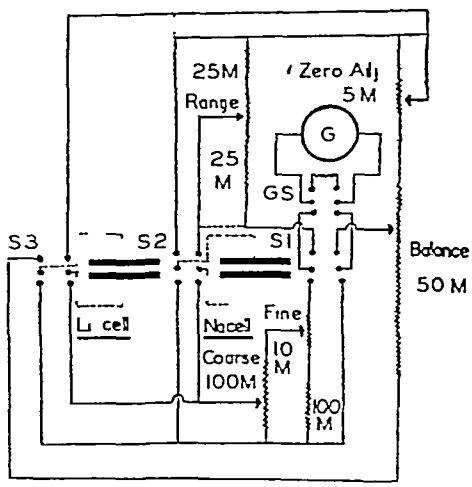


Fig 5—Electrical circuits. S 1 2, and 3 = Two-pole double-throw switches. G = Galvanometer Balance = Accurate balancing potentiometer M = 1000 ohms resistance.

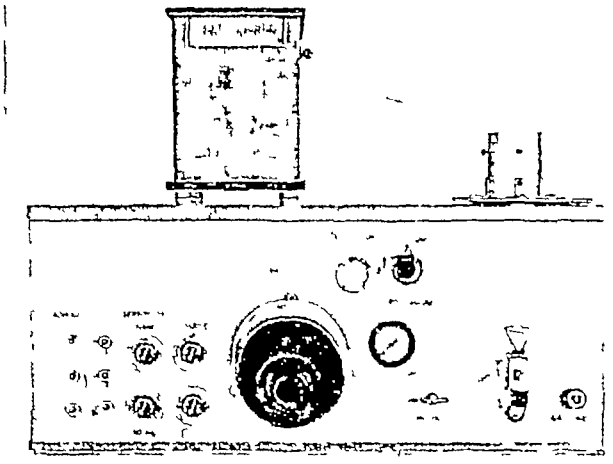


Fig 1—Combined direct and internal standard flame photometer

experience with an instrument that has given reliable service in several thousand determinations, on published work (Gerlach 1925, Lundegardh 1929, 1934, Berry et al 1946), and on discussions with other workers in this field

PRINCIPLES

The physical basis of flame photometry is complex, but a brief study of the main principles will suffice for practical purposes

When an atom is heated one of its electrons absorbs the added energy and jumps to an outer orbit, where it rotates at a higher energy level This electron is now in an unstable position and tends to spring back to the orbit from which it came As it returns, it emits as light the difference in energy required for rotation in the two orbits concerned The intensity and wave length of the light is related to the position and energy level of the moving electron Hence, each element, when heated in a flame under standard conditions, emits a characteristic light spectrum not given by any other element

However, when energy is supplied at greatly different rates—i e, at widely different temperatures—one element may produce a series of different emission spectra according to the number of orbiting electrons available in its atoms to absorb the energy supplied At very high temperatures the outer electron may leave the field of the nucleus altogether, and an additional or ion spectrum will then be produced Thus, the higher the temperature the more complex the spectra become In the hydrogen air flame only the most easily excited spectral lines —the first atomic spectra of the alkali and the alkaline earth metals—are produced The flame must be sufficiently hot to vaporise the compounds to be analysed In the solid phase, continuous or band spectra are produced which are useless for analytical purposes

At high temperatures interference phenomena occur between spectra of different elements For example, with an oxyacetylene flame at 3500°C the presence of sodium increases the apparent intensity of the characteristic potassium emission This effect is minimal at 1800°C in the hydrogen air flame

An emission spectrum may to some extent be absorbed by atoms of another element, and well-marked specific absorption occurs when unheated atoms of the same element are present Both these effects are minimised by dilution But in flame photometry the flame must supply energy at a sufficient rate to excite all the atoms delivered to it Otherwise, the non radiating atoms will immediately absorb the light emitted by those that have been excited

The main conditions for quantitative flame photometry may be summarised as follows *A solution of the test material, appropriately diluted, is delivered at a uniform rate to a flame of constant energy output* After vaporisation a variable number of atoms will thus be excited, and each atom will emit a constant amount of light of a characteristic wave length This light is concentrated and selected by a suitable optical system, converted into electrical energy by a photocell, and measured by a galvanometer

In *direct flame photometry* a single optical system and one photo electric cell are used, so that the deflection of the galvanometer is a measure of the intensity of the emission spectra and of the concentration of the elements in the heated specimen

In *internal standard flame photometry* a constant proportion of lithium is added to all the test and standard solutions By the use of a double optical system and matched photo electric cells the ratio of two different spectra is measured under conditions such that any uncontrolled variation in the emission of one element is balanced by a similar alteration in that of the lithium internal standard element It will be shown later that this internal standard technique compensates for many of the serious errors which limit the value of direct flame photometry in the analysis of complex biological fluids

How these principles are applied to the design and operation of a combined direct and internal standard photometer is described below The diagrams (figs 1–3) are drawn to scale, so that the dimensions of the apparatus, none of which is critical, may be obtained by measurement

CONSTRUCTION OF THE PHOTOMETER

Emission spectra are produced by spraying into the flame an "atomised" aqueous solution of the materials to be examined The heat rapidly evaporates the minute droplets of water and vaporises the compounds in solution These are now in a gaseous phase so that characteristic emission spectra are produced

The design of the atomiser is one of the most important considerations in the construction of a photometer The rate of atomisation must be constant and the droplet size uniformly small The atomiser must be easy to clean In the best type a concentric flow of fluid and air produces a conical mist of nearly uniform particle size, and 10–15 ml of the test solution is atomised per minute, using 8 litres of compressed air

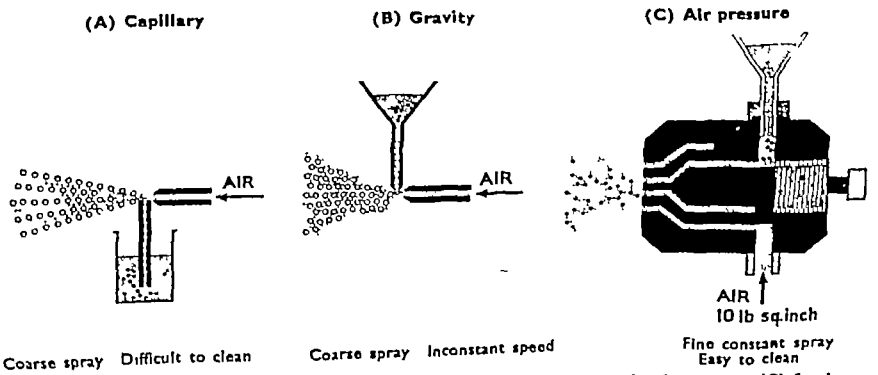


Fig 2—Three types of atomiser with (A) capillary feed; (B) gravity feed; and (C) feed controlled by air pressure

than combinations of glass filters * Spectral selection by means of a diffraction grating or a prism and slit mechanism requires a much higher degree of precision than can be obtained in the average workshop

Large selenium barrier layer photo electric cells of matched output have been used in this instrument because they have a broad spectral response, are free from drift and fatigue, and have a relatively high output at low intensities of illumination Most selenium cells are not sensitive to light of a wave length longer than 650 mμ and are therefore useless for measuring the emission spectra of lithium and potassium It is possible to obtain red sensitive photocells, and for photometry those with the largest output at 770 mμ should be chosen The output of the cells should be such that, with the instrument switched to the direct circuit, a solution containing 0 5 m eq of potassium per litre will produce a full scale deflection of the galvanometer A biased circuit may be used when very low light intensities are encountered

Phototubes may be used in place of the selenium cells, but these require a long warming up period before use Their output is comparatively low, so they require a stable form of amplification Photomultiplier tubes may be used, but these require a well regulated electric power supply and also take a considerable time to reach a stable output

The electrical circuit shown in fig 5 is designed for use with selenium cells The two pole double throw switches enable the instrument to be used either as a direct or as an internal standard instrument The wire wound linear rheostats allow different voltages to be tapped off the cells, and thus act as fine and coarse sensitivity selectors When used on the internal standard circuit the photocells oppose each other, and a balance or null point reading is obtained by turning the potentiometer dial until the galvano meter is steady at zero

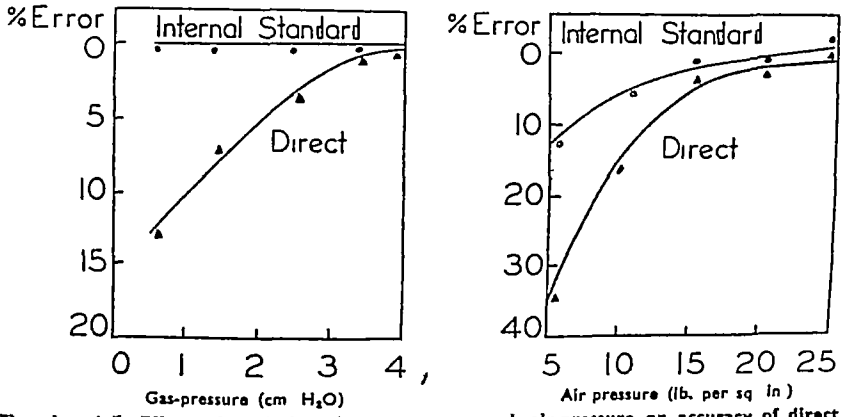
A highly sensitive galvanometer is essential The one here has a sensitivity of 0 0005 microamps per mm , a period of 4 sec , an internal resistance of 4000 ohms, and a critical external damping resistance of 50,000 ohms A galvanometer shorting switch should be incorporated in the circuit

OPERATIONAL INSTRUCTIONS

Direct Flame Photometry

To ensure a stable zero, the galvano meter is switched on 10 minutes before use The gas is lit and the pressures of air (15 lb per sq in) and gas (5 cm of water) are adjusted to give a steady sub blast type of flame The selector dial is turned to provide the appropriate filters Distilled water is poured into the atomiser funnel and the galvanometer is adjusted to zero The solution to be tested is now poured in and the sensitivity dial is turned until a suitable galvanometer reading is produced Readings are obtained for two standard solutions (all standard solutions must be kept in hard glass bottles) of the same element, one slightly more concentrated and the other slightly more dilute than the unknown solution By interpolation between these two standard readings the concentration of the unknown solution is obtained By using four or more standards a calibration curve can be constructed, and with solutions up to 0 5 m eq per litre this should be linear Above this concentration the galvanometer reading will not be directly proportional to the concentration, because specific absorption by non radiating atoms of the same element occurs in the flame If a calibration curve is used, it is essential to construct a new one for each series of estimations and to check the readings repeatedly during the series of observations

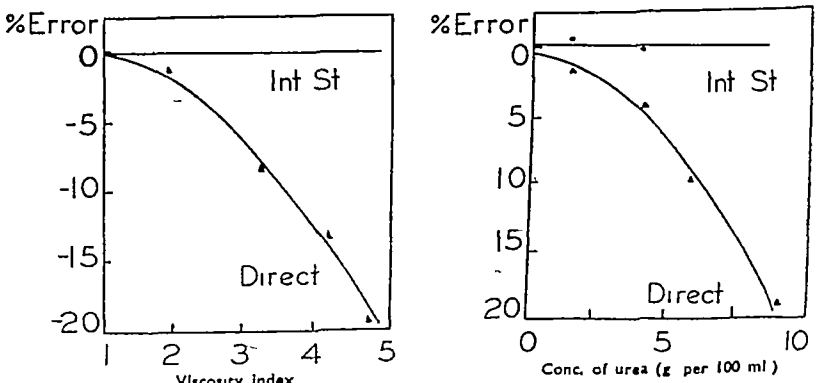
With simple dilute solutions (less than 1 m eq per litre) the accuracy of the estimations obtained is ± 3% However, small variations in the pressures of gas or air will produce a very large error (figs 6 and 7) Furthermore, the viscosity of the test solutions modifies their rate of atomisation and hence the galvanometer readings obtained (fig 8), with many biological fluids—e g , plasma diluted less than 1 in 50—a correction for viscosity is therefore essential In complex solutions non specific absorption by other elements is pronounced. The presence of organic molecules, such as urea, in the solutions also interferes with estimations (fig 9), and some acids (e g , nitric acid, fig 10) strongly inhibit spectral emission Thus the many possible sources of error make direct flame photometry a very uncertain method of analysing biological fluids Fortunately, many of these difficulties can be overcome by internal standard flame photometry (Berry et al 1946)



Figs 6 and 7—Effect of variations in gas-pressure and air-pressure on accuracy of direct and indirect flame photometry

Internal Standard Flame Photometry

Lithium is the most suitable element for the internal standard because it seldom occurs in biological fluids, it is closely related to sodium and potassium, and it gives an intense line spectrum midway between these two elements A constant proportion of lithium (1 in 20,000) is added to all the standard solutions and to those of



Figs 8 and 9—Effect of changes in viscosity of test solution and presence of urea on accuracy of direct and indirect photometry

* Since this paper was written interference filters with a transmission band width of less than 10 mμ have become available and these are now in use

unknown concentration that are to be tested. The potential produced by the selected lithium light falling on one photocell is opposed by a similar potential from the opposite cell, which is excited by the sodium or the potassium light These E.M.F s are balanced by an accurate potentiometer, and a calibration curve is constructed by plotting the potentiometer readings against the concentration of the standard solutions

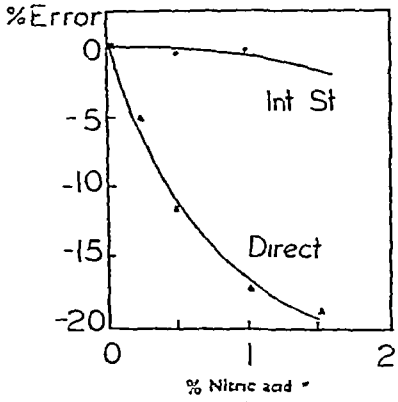


Fig 10—Effect of nitric acid on accuracy of direct and indirect photometry

Many of the non-specific sources of error which interfere so greatly with direct flame photometry equally affect the emission of the lithium and of the sodium or potassium spectra Such effects will now be opposed by the balance technique and largely cancel out It can be seen from figs 6–10 that the device of an internal standard compensates for any small variations in the pressures of gas or air (figs 6 and 7), for changes in viscosity of the test solutions (fig 8), for the effects of some organic molecules (fig 9), and for the absorption caused even by dilute solutions of nitric acid (fig 10)

This method does not eliminate all possible sources of error Solutions of carbohydrates emit a continuous band spectrum of carbon, which gives falsely high readings for sodium In estimating the sodium content of solutions containing sugar in concentrations over 0 01% the carbohydrate must always be oxidised completely before testing Studies on the effect of protein in the test solutions have been made by the use of albumin rendered almost electrolyte-free by electro-dialysis Albumin in concentration of less than 0 05% has a negligible effect on internal standard flame photometry Hence it is possible to estimate sodium and potassium in plasma without previous precipitation of the proteins, provided the plasma is diluted by the addition of 100 or more parts of water Urine, if suitably diluted, can be analysed directly, but with tissues, diets, and stools complete oxidation of organic matter by boiling with concentrated HNO_3 is an essential preliminary step

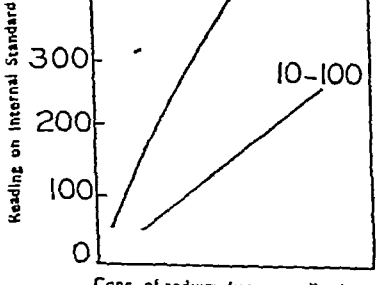


Fig 11—Calibration curves for indirect flame photometry over wide range of sensitivities.

With suitably prepared solutions the accuracy of sodium and potassium estimations by the internal standard technique is within ± 1 5%, over a concentration range of 0 01–1 0 m eq per litre (fig 11) New developments are under trial by means of which calcium and other elements may be estimated, even in the presence of a large excess of sodium

Although the techniques described provide simple, accurate, and rapid means of estimating sodium and potassium in complex biological fluids, it is absolutely essential for the operator to have a sound knowledge of the theoretical principles if he is to avoid the many practical difficulties In every new application of flame photometry it is wise to check the initial results against those obtained by standard chemical methods

SUMMARY

The principles, design, and operation of a combined direct and internal standard flame photometer are described

Some of the many possible sources of error in flame photometry are discussed together with the methods for avoiding them

Flame photometry is an accurate and rapid technique for estimating the concentration of sodium and potassium in aqueous solutions or in plasma or other complex biological fluids, and is a great convenience in clinical medicine, pædiatrics, and surgery Despite the apparent simplicity of the method it is unsuitable for the use of unskilled or uncritical workers

The work described in this paper was done during the tenure of a Bilton Pollard Fellowship from University College Hospital and a Research Fellowship at the College of Physicians and Surgeons New York.

I wish to express my thanks to Prof M L Rosenheim for his help in the preparation of this paper to Prof Robert F Loeb, of the College of Physicians and Surgeons, New York, for his encouragement and financial aid, and Dr G H. Mudge and Dr C L Fox for their ready advice and assistance

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Reviews of Books

Atlas of Mahfouz's Obstetric and Gynæcological Museum

NAGUIB PACHA MAHFOUZ M.CH., F.R C O G (Hon.), F.R C.P F.R C.S (Hon), consultant obstetric and gynæcological surgeon Kasr-el Aini Hospital consulting surgeon, Kitchener's Memorial Hospital director of the Gynæcological Department of the Coptic Hospital. Altrincham, England John Sherratt & Son 1949 Pp about 1250 Set of 3 vols, £9 9s

THIS atlas is an illustrated catalogue of mounted pathological specimens in the Mahfouz Obstetric and Gynæcological Museum in Cairo The museum, containing almost 1300 specimens, is the work of Mahfouz Pasha, who operated on most of the cases himself In the preface he says In passing from one stage to another I have given a description of the pathological anatomy of the parts concerned In subjects of which I have made special studies I have described the clinical features and the operative procedures I perform and have given an historical review showing the evolutions which gradually developed into our present-day conception of these diseases He hopes that the atlas will prove useful to advanced students who propose to specialise in gynæcology and obstetrics and who are already familiar with ordinary textbooks

The strength of the book lies in its wealth of material, especially concerning such conditions as rupture of the uterus chorionepithelioma, and concealed accidental

than combinations of glass filters * Spectral selection by means of a diffraction grating or a prism and slit mechanism requires a much higher degree of precision than can be obtained in the average workshop

Large selenium barrier layer photo electric cells of matched output have been used in this instrument because they have a broad spectral response, are free from drift and fatigue, and have a relatively high output at low intensities of illumination Most selenium cells are not sensitive to light of a wave length longer than 650 mμ and are therefore useless for measuring the emission spectra of lithium and potassium It is possible to obtain red sensitive photocells, and for photometry those with the largest output at 770 mμ should be chosen The output of the cells should be such that, with the instrument switched to the direct circuit, a solution containing 0 5 m eq of potassium per litre will produce a full scale deflection of the galvanometer A biased circuit may be used when very low light intensities are encountered

Phototubes may be used in place of the selenium cells, but these require a long warming up period before use Their output is comparatively low, so they require a stable form of amplification Photomultiplier tubes may be used, but these require a well regulated electric power supply and also take a considerable time to reach a stable output

The electrical circuit shown in fig 5 is designed for use with selenium cells The two pole double throw switches enable the instrument to be used either as a direct or as an internal standard instrument The wire wound linear rheostats allow different voltages to be tapped off the cells, and thus act as fine and coarse sensitivity selectors When used on the internal standard circuit the photocells oppose each other, and a balance or null point reading is obtained by turning the potentiometer dial until the galvano meter is steady at zero

A highly sensitive galvanometer is essential The one here has a sensitivity of 0 0005 microamps per mm, a period of 4 sec, an internal resistance of 4000 ohms, and a critical external damping resistance of 50,000 ohms A galvanometer shorting switch should be incorporated in the circuit

OPERATIONAL INSTRUCTIONS

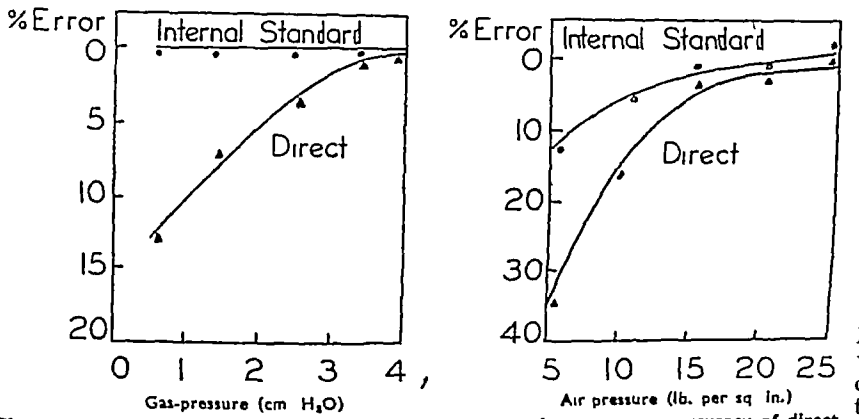
Direct Flame Photometry

To ensure a stable zero, the galvano meter is switched on 10 minutes before use The gas is lit and the pressures of air (15 lb per sq in) and gas (5 cm of water) are adjusted to give a steady sub blast type of flame The selector dial is turned to provide the appropriate filters. Distilled water is poured into the atomiser funnel and the galvanometer is adjusted to zero The solution to be tested is now poured in and the sensitivity dial is turned until a suitable galvanometer reading is produced. Readings are obtained for two standard solutions (all standard solutions must be kept in hard glass bottles) of the same element, one slightly more concentrated and the other slightly more dilute than the unknown solution By interpolation between these two standard readings the concentration of the unknown solution is obtained By using four or more standards a calibration curve can be constructed, and with solutions up to 0 5 m eq per litre this should be linear Above this concentration the galvanometer reading will not be directly proportional to the concentration, because specific absorption by non radiating atoms of the same element occurs in the flame If a calibration curve is used, it is essential to construct a new one for each series of estimations and to check the readings repeatedly during the series of observations

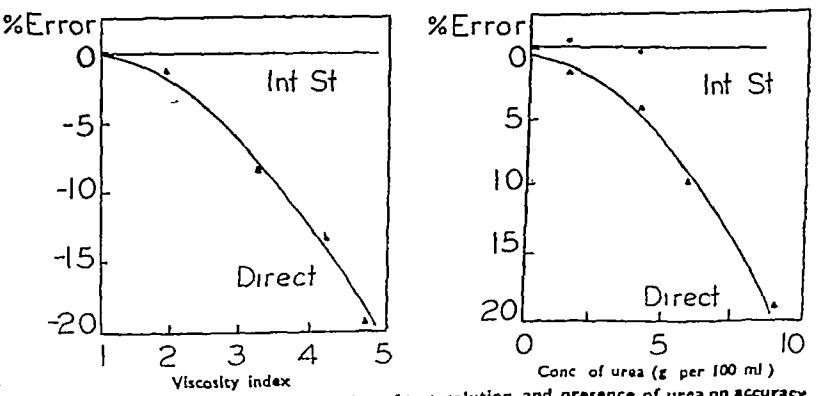
With simple dilute solutions (less than 1 m eq per litre) the accuracy of the estimations obtained is ± 3% However, small variations in the pressures of gas or air will produce a very large error (figs 6 and 7) Furthermore, the viscosity of the test solutions modifies their rate of atomisation and hence the galvanometer readings obtained (fig 8), with many biological fluids—e g, plasma diluted less than 1 in 50—a correction for viscosity is therefore essential In complex solutions non specific absorption by other elements is pronounced. The presence of organic molecules, such as urea, in the solutions also interferes with estimations (fig 9), and some acids (e g, nitric acid, fig 10) strongly inhibit spectral emission Thus the many possible sources of error make direct flame photometry a very uncertain method of analysing biological fluids Fortunately, many of these difficulties can be overcome by internal standard flame photometry (Berry et al 1946)

Internal Standard Flame Photometry

Lithium is the most suitable element for the internal standard because it seldom occurs in biological fluids, it is closely related to sodium and potassium, and it gives an intense line spectrum midway between these two elements A constant proportion of lithium (1 in 20,000) is added to all the standard solutions and to those of



Figs. 6 and 7—Effect of variations in gas-pressure and air pressure on accuracy of direct and indirect flame photometry



Figs 8 and 9—Effect of changes in viscosity of test solution and presence of urea on accuracy of direct and indirect photometry

* Since this paper was written interference filters with a transmission band width of less than 10 mμ have become available and these are now in use

THE LANCET

LONDON SATURDAY, NOV 25, 1950

Balances

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If future registrars, having finished their training, are really to have a reasonable chance of a consultant post, then a cut of some sort is inevitable for even if the consultant services were considerably expanded the present numbers would be too great We have all hoped for such expansion, and with unlimited resources of money the arguments for undertaking it would be irresistible But the resources of the health service are very far from being unlimited, they are, in fact, not much more than sufficient for maintenance Last March Sir STAFFORD CRIPPS, as Chancellor of the Exchequer, declared in the plainest terms that the nation was spending as much as it could afford on its health service, we could not, he declared, exceed the present rate of expenditure Moreover, in this as in other countries, the cost of providing medical care and especially hospital care is rising year by year Thus if the present restriction on spending is retained—and the inflationary pressure of rearmament makes it virtually certain it will be—we may soon be thinking, not of where the service should be expanded, but of where it can least harmfully be contracted Economies are of course possible, but it is broadly true that no part of the service can now be substantially developed except by withdrawing money from some other part Repeatedly this journal has urged that the right policy for the next few years is to concentrate especially on improving the kind of medical care that can properly be given outside hospital, and for this purpose to improve the conditions of general practice Facing the economic facts, we cannot simultaneously join in the demand that consultant establishments should now be increased Indeed, if no personal hardships were involved, we should not be sorry to see the body of general practitioners strengthened by many able men and women, some of whom are good general doctors as well as good specialists we should not be sorry, that is to say, if we thought that the conditions of practice would permit them to do good work

Unfortunately, as things stand, very real hardship is in prospect for hundreds of registrars, no longer in their first youth, who will now have to make a fresh start Many of them recognised from the first that they risked more than their predecessors in similar posts, and this awareness has gradually become more acute, for example, last year, at the opening meeting of the B M A registrars' group, members heard it suggested that only 1 in 5 of senior registrars would gain a consultant appointment Yet by usage the registrar should have a fair chance of advancement, which is now to be denied him Here the profession itself bears some responsibility, for restraint in claims for registrars, together with professional advice to hospital authorities, might have helped to keep the numbers within bounds, and the vigour with which the cuts have been denounced might equally have been applied to inhibiting the earlier heedless growth Where the Ministry of Health has been at fault is in failing to give its facts sooner and to secure agreement on what should be done A year ago we remarked that registrars had too long been kept in the dark about their prospects, and we called on the regional boards to furnish what illumination they could The boards, we understand, were asked some time ago to review establishments in order to restore some sort of balance, but most of them preferred to leave the initiative to the Ministry itself The reduction, now that it is on us, is startling more for its abruptness than its extent

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hæmorrhage The case histories are clear, concise, and instructive, and the discussions on such subjects as rupture of the uterus are most interesting In dealing with the management of fibroids complicating pregnancy the value of conservative treatment is emphasised (In a country like Egypt, where the patient still hesitates to consult a doctor, or sometimes to take his advice, there is an opportunity to demonstrate what can be accomplished by "masterly inactivity" In some parts of Britain, where many of these serious complications are now seldom seen, there may be a tendency to over-treat those which do occur) On the other hand there are surprisingly few specimens illustrating eclamptic toxæmia, and those which do appear are not entirely satisfactory Throughout the book the paintings are technically excellent, and many of the drawings are very good, but they suffer from the fact that they depict the appearance seen in the jar at the time they were painted or drawn and not the appearance seen at the time of operation when the specimens were obtained The result is that the paintings are not life like and some of the drawings are difficult to follow because the specimen has become wrinkled This is a great pity in view of the great variety of unusual cases available Some of the photomicrographs are likewise disappointing, the histological detail being poor and the fields not always well chosen

Though the author says that this book is for advanced students, much of the more systematic discussion is elementary and rather out of date For example, he states that "the most common cause of fœtal death is intoxication through the maternal circulation This may be of bacterial origin such as syphilis, malaria, auto infection, etc, or due to metabolic disease such as diabetes or albuminuria or to the toxæmias of pregnancy Syphilis is by far the most important antenatal disease which leads to death of the fœtus" The general effect of this unevenness in the standard of writing is that the really important cases and the instructive discussions are hidden away in the systematic text and among statistics which by their very nature cannot be very helpful

Any such book is open to criticisms, and if this monumental work has shortcomings they must not be allowed to obscure its real value It consists of three volumes printed on fine paper and illustrating conditions which in this country the obstetrician seldom sees Dr Mahfouz is to be congratulated on bringing so great a labour to a worthy conclusion

John Hunter

S Roodhouse Gloyne, consulting pathologist, London Chest Hospital and King Edward VII Sanatorium, Midhurst Edinburgh E & S Livingstone 1950 Pp 104 15s

In little compass the late Dr Gloyne has contributed a notable study of a much studied man He draws what one feels must be a true picture of Hunter's strange character—a man of rough (even coarse) fibre, with little book-learning, with much to say yet little able to express his thoughts, but a man moved by a passionate desire to understand facts and with an intellect which many times led him straight to the truth It is the peculiar value of this book that it places John Hunter's figure against a vividly painted background of the London life of his time—on one side indescribable squalor, on the other gaiety and fashion moving in sedan chairs to the opera or Vauxhall The teacher of anatomy and surgery was more often in contact with the squalor than with the refinement of the 18th century While John Hunter's charming wife could enjoy the friendship of Mrs Montague and of Fanny Burney, her husband was forced by circumstance to take part in the unsavoury transactions of the resurrection men The stench of the crowded dissecting rooms, housed in makeshift cellars or outhouses, was such that dissection became a seasonal occupation, impossible and abandoned in the heat of summer

The book is without explanatory footnotes, and there are no detailed references given to quotations from other works But as it stands, both in style and in matter, it is a little masterpiece of medical biography

Coronary Circulation in Health and Diseases

Donald E Gregg, M D, chief research physician, medical department, Field Research Laboratory, Fort Knox, Kentucky London Henry Kimpton 1950 Pp 227 31s 6d

Dr Gregg, approaching his subject as a laboratory and research worker, deals most fully with coronary flow in animals, first under basal conditions as nearly physiological as possible, and then under the influence of various factors which determine alterations in flow It seems doubtful, from the observations discussed, whether there is any evidence of direct nervous control of the coronary calibre, or of the influence of drugs (the nitrites excepted), for both nerves and drugs affect the work of the myocardium, with metabolic consequences which closely control the coronary circulation. The last chapter deals with the histology of coronary lesions the methods by which they may be produced experimentally, and their effects Abnormal lipoid metabolism is not thought to be a factor in most cases of coronary obstruction, the various drugs used with the object of preventing ventricular fibrillation are probably ineffective, and the possibility that any drug can limit the size of an infarct in man seems to be remote Dr Gregg has repeatedly to conclude that the views and statements of others are unwarranted or unproved The result is a review in which the reader can feel confidence even if it lessens his hope of improving coronary blood-flow with most of the drugs proposed for the purpose

Progress in Chromatography, 1938-47

L Zechmeister, California Institute of Technology, Pasadena, California London Chapman and Hall, 1950 Pp 367 45s

The ten years covered by Professor Zechmeister's review have seen much new invention and adaptation in the field of chromatography Partition chromatography, preparative and analytical, in columns or on paper strips, has been known for only a few years, but these methods are now at least as important as the original adsorption technique

After a general section devoted to principles and methods, the author has provided a compendium of actual experimental detail, dealing with chlorophyll, porphyrins, bile pigments, carotenoids, miscellaneous natural pigments, synthetic dyestuffs, miscellaneous aliphatic substances, lipoids, carbohydrates, amino acids and peptides, sterols and some steroids, terpenes and some related compounds, benzene, naphthalene, diphenyl, diphenyl alkyl and the indene series, heterocyclic compounds, alkaloids, vitamins, antibiotics, enzymes, and miscellaneous biological substances He also discusses inorganic chromatography, and the applications of chromatography to technology

Ten years is too long to wait to review this rapidly expanding field, and we hope that Professor Zechmeister will repeat this signal service in five years' time

Essays in the History of Medicine

George Gask, C M G, D S O, F R C S London Butterworth 1950 Pp 209 30s

This volume of eight essays will be welcomed by all students of medical history Every one of them has something new to say and every one shows evidence of careful research

For instance John Hunter's experiences as an army surgeon in Portugal, recounted in the sixth essay, are probably little known even to those who know much of the history of his later life It is interesting to find that, a hundred years before Florence Nightingale astonished the world, the hospital with 202 patients in which he served was equipped with a regular establishment of women nurses, including a matron, 2 head nurses, and 18 nurses—1 nurse to every 10 patients Nothing is to be learnt of the training of these women, but on Aug 9, 1762 the Adjutant-General wrote to the Commander in Chief that it would be unwise to discharge any of the nursing staff "as their places cannot be supplied in an emergency" This suggests that they possessed some skill which could not be replaced by untrained women hurriedly impressed. Professor Gask thinks it likely that they were recruited from the London hospitals Things seem to have been better not only after, but also before, the Crimea

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The conclusion is inescapable that, unless many recently upgraded hospitals are to be deliberately downgraded, some of their specialised work will have to be done by doctors who have no further expectation of becoming consultants Ways have to be found by which it can be done well and willingly, and by which the transit of many hospital registrars into general practice can be made at least tolerable The need here is for constructive suggestions, and we welcome those put forward by Dr TALBOT ROGERS on p 641

Q Fever

THOUGH it may be one of the rarer infectious diseases, Q fever is attracting world-wide attention, partly because of its remarkable and varied epidemiology and partly because of the unorthodox character of the causative organism, *Rickettsia burneti*

Clinically it has few striking characteristics, and it must be sought among patients with "pyrexia of undetermined origin" or with "primary atypical pneumonia" Generally the illness begins abruptly with a particularly severe headache, sometimes accompanied by photophobia The headache may indeed be so intense that meningitis is suspected, but a spinal tap rarely reveals an increase of cells in the cerebrospinal fluid There is high fever, and profuse sweating as the temperature fluctuates from 103–4°F to normal during the course of a day or less "Burning eyes," lacrimation, and conjunctivitis may add to the patient's discomfort, but he has none of the upper respiratory symptoms of "influenza" or "febrile catarrh" The illness lasts on the average some twelve days, the temperature falling by lysis Between the third and sixth days, or thereabouts, there may be a little cough, and on careful examination a few fine râles will be heard in the chest, but the signs are slight in relation to the extent of the lung lesion revealed by X rays Pneumonia is present in about 70–80% of patients, including some of those with a very mild general illness, in fact in one large outbreak [1] radiography was used for discovering cases But Q fever is more than an infection of the lung *R burneti* can be recovered from the blood stream during the fever and from the urine during early convalescence, and consequently lesions may be spread widely MOESCHLIN and KOSZEWSKI,[2] in 50 cases with serologically proven Q fever, reported 9 with complications (5 thrombophlebitis with pulmonary embolism, 3 epididymitis, 1 encephalitis, and 1 pancreatitis) All these extrapulmonary complications appeared after the fourteenth day of illness, when the lung lesion was resolving The findings of WHITTICK,[3] who in a fatal case demonstrated rickettsiæ in the lung, spleen, brain, testis, and kidney, suggest that the lesions outside the lungs are probably due to the rickettsia itself This occurrence does much to modify an impression, gained largely from studies of the disease in young and healthy troops, that Q fever is necessarily benign and trivial Convalescence is often marked by loss of weight, muscular pains, lassitude, and easy fatiguability which can last three months or longer In some patients this vague disability is punctuated by a genuine relapse with fever and a return of the original symptoms, and a few have had relapses occasionally for years [4]

A tentative diagnosis of Q fever can be confirmed by isolating the organism or by demonstrating the highly specific complement-fixing antibodies which appear in the serum during convalescence In this country the Virus Reference Laboratory of the Public Health Laboratory Service, examining sera from some 700 patients with acute infective respiratory disease, found that about 3% had a significant titre to *R burneti* [5] Of the 300 patients clinically diagnosed as having "atypical or virus pneumonia," there was serological evidence of infection with influenza virus in 16%, with a virus of the psittacosis ornithosis group in 2%, and with *R burneti* in 5%, while 11% had either cold hæmagglutinins, *Streptococcus MG* agglutinins,[6] or both Cold and *Strep MG* agglutinins were rarely observed in association with a positive specific complement fixation test for influenza, psittacosis ornithosis, or *R burneti* It seems, therefore, first that *R burneti* is not a common cause of atypical pneumonia in Great Britain, and secondly that the likelihood of any particular case of atypical pneumonia being one of Q fever is small if the patient has a positive cold hæmagglutinin or *Strep MG* agglutinin test

Cases of Q fever have now been found in Kent, Devon, Somerset, Gloucestershire, Wiltshire, Denbighshire, and Oxfordshire Papers in our columns have described the detection of the first cases,[7] the clinical features of the cases,[8] and the isolation [9] of *R burneti* from one of the patients, and a few months ago we reviewed the epidemiology of the disease [10] This week we publish communications on the properties of some English strains of *R burneti*, and on the spread of the disease in one of the outbreaks The story of how infection passed from a patient to a ward nurse and three members of the staff of the pathological department at the Royal Cancer Hospital is of interest because human to human spread of infection is rare in Q fever Infection of persons performing a necropsy is perhaps rather a special instance of case to case spread which has occurred elsewhere,[4 11] but infection of ward staff is exceptional, though DEUTSCH and PETERSON [12] have lately recorded an incident in a Californian hospital when three nurses developed Q fever from fourteen to twenty-three days after first attending a patient with the disease The infectiousness of a minority of cases of Q fever is not fully explained, but it is possibly related to the severity of the illness, to the amount of sputum produced, or to the cleanliness with which urine is passed The "source case" at the Royal Cancer Hospital was producing sputum and was incontinent of urine at the end of his illness, and though DEUTSCH and PETERSON do not say whether their patient was producing sputum he was

1 Feinstein M. Yesner R Marks J L *Amer J Hyg* 1946 44 72
2 Moeschlin, von S Koszewski B J *Schweiz med Wschr* 1950 80 929
3 Whittick J W *Brit med J* 1950 i 979
4 Beck M D Bell J A Shaw E W Huebner R J *Publ Hlth Rep Wash* 1949 64 41
5 See *Brit med J* 1950 ii 282
6 Thomas L Mirick G S Curnen E C Ziegler J F Horsfall F L jun *Science* 1943 98 566
7 Stoker M G P *Lancet* 1949 i 178
8 Harman J B *Ibid*, ii 1028
9 MacCallum F O Marmion B P Stoker M G P *Ibid* p 1026
10 *Ibid* 1950 i 960
11 Huebner R J cited by Deutsch and Peterson (ref 12)
12 Deutsch D L Peterson F T *J Amer med Ass* 1950 143 348

evidently very ill These examples of human to-human spread should not distract attention from the fact that most patients with Q fever seem to acquire their infection from animals, either by consuming infected raw cow's milk [13] or by inhaling dust containing *R burneti* [13] Until recently the sources of rickettsiæ in the dust were somewhat obscure, for only tick excreta,[14] colostrum, and milk [15] had been shown to contain the organism But the finding of large numbers of rickettsiæ in the placenta of cows [16] and sheep,[17] and the isolation of the organism from the fæces and nasopharyngeal secretions of sheep,[17] helps to remove this difficulty DELAY et al [18] in Northern California provided direct proof of the presence of *R burneti* in dust when they isolated the organism from air samples collected on a dairy farm and on a sheep ranch, where human cases of Q fever had occurred

Treatment with chloramphenicol or 'Aureomycin' has given promising results, and a prophylactic vaccine has been prepared from killed and purified rickettsial suspensions grown in the yolk sac of the chick embryo MEIKLEJOHN and LENNETTE [19] report that in their laboratory, though an unimmunised serologist contracted the disease, there have been no cases among immunised workers—an observation which is possibly significant in view of the notorious infectiousness of *R burneti* in the laboratory Controlled data on the protective effect of the vaccine might be obtained by offering inoculation to workers in industries such as slaughtering, dairying, and meat packing, where the occupational risk of Q fever may be high [13]

Flame Photometry

THE growing list of disorders associated with disturbances in the potassium and sodium contents of the body fluids already includes the œdemas, uræmias, several forms of dehydration, defects in carbohydrate metabolism and in suprarenal function, and many others Hitherto, investigators in this field have been hampered by the tedious and difficult chemical techniques used for estimating sodium and potassium in blood and urine But thanks to the recent developments in the physical method of flame photometry these determinations can now be done simply and rapidly, and instead of being essentially research procedures they will soon be part of the routine work of a biochemical laboratory.

The flame photometer measures the intensity of light emitted when solutions of certain metallic salts are sprayed into a flame Twenty years ago LUNDEGÅRDH [20] developed an apparatus in which the spectrum produced in this way was photographed and compared with similar spectra from standard solutions In the various types of modern instruments [21–23] the light from the flame falls on a photocell and the spraying and burning conditions are kept constant so that the current produced gives a direct measure of the concentration of the metal in solution Commercial models of the flame photometer are now widely used in the United States, and several British instrument makers are exploring the possibilities of building them here Meanwhile, many home-made instruments are already working in British hospitals, and Dr SPENCER describes one of them in this issue (p 623) His experience agrees with that of others [24] in showing that for estimations of the alkali metals flame photometry is as reliable as the chemical methods and it is probably more reliable in the hands of all but the most expert technicians It also saves a great deal of time, for a technician with a photometer can easily do 20 determinations of sodium or potassium in serum in two or three hours, whereas this number of chemical estimations would take a day or more A single determination can be completed with the flame photometer within a quarter of an hour of the laboratory receiving the blood, so in an emergency the clinician can find out his patient's serum sodium or serum-potassium level in time to act on the information Such rapid analyses are vital in the cases of potassium lack which may arise, for example, during recovery from diabetic coma or after diarrhœa and vomiting [25], also in patients suffering from salt depletion as a result of low-sodium diets or mercurial diuretics [26], and in cases of uræmia [27]

Turning to the working details of a photometer, the solution to be analysed (plasma, serum, or urine must first be diluted with water) is blown or sucked into a carefully controlled flame burning coal gas, acetylene, or butane The light from the flame is passed either through colour filters, as in colorimeters, or through a spectrometer, to isolate the light of the wave length characteristic of the metal being determined This light then falls on a photosensitive element (a selenium barrier-layer cell or a phototube) and the current is measured, with or without amplification, on a galvanometer The chief difficulty lies in keeping the spraying and burning conditions constant Some flame photometers, including Dr SPENCER's, add a known amount of some "foreign" element, such as lithium, to the solutions, so that most of the instrumental errors affect the readings from this "internal standard" as well as those from the test solutions, and are therefore cancelled out The safest method of operation with all instruments, however, is to take readings with a standard solution of about the same strength as the test solution before or after each test The presence of foreign elements in the solutions tested affects the light emission of sodium and potassium, and it is necessary to find out for each photometer what effects the foreign constituents of blood and urine have on the results In some instruments sodium increases the light emission of potassium [23 28] Interference of this kind can easily be corrected by preparing standard solutions of, say, potassium salts containing the interfering elements in the proportions present in normal serum

13 Bell J A Beck M D Huebner R J *Ibid* 142 868
14 Derrick E H *J Hyg Camb* 1943 43 357
15 Huebner R J Jellison W L Beck M D Parker R R Shepard C C *Publ Hlth Rep Wash* 1948 63 214
16 Luoto L Huebner R J *Ibid* 1950 65 541
17 Lennette E H *Bact Rev* 1950 14 249
18 DeLay P D Lennette E H DeOrme K B *J Immunol* 1950 65 211
19 Meiklejohn G Lennette E H *Amer J Hyg* 1950 52 54
20 Lundegårdh H G *Die quantitative Spektralanalyse der Elemente* Jena 1934
21 Barnes R B Richardson D Berry J W Hood R L *Industr engng Chem (Anal)* 1945 17 605
22 Willebrands A F jun. *Rec Trav chim.* 1950 69 799
23 Domingo W R Kline W *Biochem J* 1949 45 400
24 Hald, P M *J biol Chem* 1947 167 499 Abul Fadl M A M *Biochem J* 1949 44 282
25 Leading article *Lancet* Sept 9 1950 p 369
26 Schroeder H A *J Amer med Ass* 1949 141 117
27 Hoff H E Smith P K Winkler A W *J clin Invest* 1941 20 607
28 Proehl E C Nelson W P *Amer J clin Path* 1950, 20 806

The simplicity of flame photometry can be illustrated by comparing the number of operations necessary for determining serum potassium levels by this method and by the widely used chemical method of JACOBS and HOFFMANN [29] The flame photometer requires only one reagent, and for each estimation two measurements must be made with a pipette and one reading taken of the galvanometer scale With the chemical method four reagents are needed, and each estimation requires nine measurements of volume, two centrifugations, and one reading of a colorimeter The stages at which mistakes can occur are roughly four times as numerous in the chemical method as with the flame photometer The reliability of one of the home made instruments in regular use has been tested by a quality control method like those commonly adopted in industrial laboratories The chemist in charge of the instrument prepared a series of standard saline solutions containing 250–350 mg of sodium per 100 ml to represent samples of plasma The technician was given one of these solutions to estimate with each batch of plasma specimens, and the differences between his findings and the known concentrations were plotted on a chart In sixteen months 150 solutions were tested in this way, with a maximum error of 6 mg of sodium per 100 ml and an average error of 2 mg

The parts for building a home made photometer cost about £100 Few of them require skilled workmanship and all the electrical components are of standard types The saving that it will effect in labour and time seems to justify the expenditure in all large biochemical laboratories

Cortisone and A C T H in Tuberculosis

IN the first flush of its success 'Cortisone' was tried in America in a wide variety of diseases Since it depresses allergic phenomena in general, and skin sensitivity to tuberculin in particular,[30 31] it seems reasonable to use it in tuberculosis But this must be something of an adventure, for cortisone inhibits the formation of granulation tissue [32 33] and has been shown to do so in the tuberculous guineapig [34], it also depresses macrophage activity,[32] reduces the amount of lymphoid tissue in the body and the number of circulating lymphocytes,[35] and interferes with the formation of antibodies [36] Even as an anti allergic weapon it might prove double edged, since a "rebound" increase in tuberculin reactivity has been noted in patients when the drug is stopped [31] HENCH and his colleagues [37] briefly mention two cases of tuberculous arthritis they have treated with cortisone, and a few patients with pulmonary or laryngeal tuberculosis, mostly in the advanced stages, have been given adrenocorticotropic hormone (A C T H) [38] The results have been fairly uniform—a prompt reduction in allergic manifestations and subjective improvement while the course lasts, but doubtful amelioration or actual deterioration in the basal disease In 13 very advanced cases, treated with A C T H plus *p* aminosalicylic acid (P A S) and streptomycin, the results were much the same as with cortisone alone—rapid transitory clinical improvement with a general feeling of well being, but the X ray films showed a greater tendency to cavitation [39] More sinister potentialities of cortisone in tuberculosis are suggested by the experiments of HART and REES [40] at the National Institute for Medical Research in London When the drug was given for 2–3 weeks to mice with a stable chronic pulmonary tuberculosis, there was a striking exacerbation of the disease and consequently a high mortality during treatment, at necropsy their lungs contained large coalescing necrotic lesions teeming with bacilli In mice with more acute types of tuberculosis the course of the infection was also accelerated by the drug Cortisone produces a similarly enhanced susceptibility to the tubercle bacillus in guineapigs, according to SPAIN and MOLOMUT [41], and streptomycin given concurrently had little effect on their findings Thus the hope that by fibrolysis cortisone might make the bacilli more accessible to antituberculous agents is not likely to be fulfilled, particularly since it apparently has no action on formed granulation tissue [32]

In their work with cortisone in the tuberculous mouse HART and REES have remarked that in this species, unlike the guineapig and man, hypersensitivity cannot be demonstrated by a positive tuberculin skin test, nor is any fibrous tissue reaction evident in tuberculous lesions, so the breakdown of resistance in the mice must be sought elsewhere—in defects of macrophage activity or lymphocytic response, or, as GREEN [42] suggests, in depression of mitosis in the formative tissues from which these and other cells concerned in resistance are derived HART and REES point out that their dosage of cortisone was relatively high, and that a disastrous failure in resistance such as they observed in mice will not necessarily occur in man, though it should certainly be watched for Until we have more than the meagre amount of information obtainable from the few cases so far published, the wise course will be to regard cortisone (and A C T H) as likely to do more harm than good to the tuberculous process, and to give them to tuberculous patients only for pressing other indications A risk whose extent cannot yet be gauged is that an unrecognised or even unrecognisable tuberculous focus may be exacerbated or activated by a course of these drugs given for approved reasons, such as rheumatism or one of the "collagen" disorders Our best defence against this danger is to examine all such patients thoroughly for tuberculous foci, including chest radiography, before starting cortisone or A C T H treatment and at intervals during and after the course We shall then learn how far the animal results apply to man,

29 King E J Micro analysis in Medical Biochemistry London 1947 p 67
30 Long D A Miles A A *Lancet* 1950, I 192 Stoerk H C *Fed Proc* 1950 9 345
31 Long J B, Favour C B *Bull Johns Hopk Hosp* 1950 87 126
32 Spain, D M Molomut N Haber A *Science* 1950 112 335
33 Ragan C Howes E L Plotz, C M. Meyer, K Blunt J W *Proc Soc exp Biol N Y* 1949 72 718 Aterman K *Lancet* Nov 11 1950 p 517
34 Karlson A G Unpublished, quoted by Hench et al (ref 8)
35 Antopol W *Proc Soc exp Biol, N Y* 1950 73 262
36 Germuth F G jun Ottinger B *Ibid* 74 815
37 Hench, P S, Kendall, E C Slocumb C H, Polley H F *Arch intern Med* 1950 85, 545
38 Freeman S Fershing J Wang C C Smith, L C Proceedings of 1st Clinical A C T H Conference London 1950 p 509 Tompsett R, LeMaistre C Muschenheim C, McDermott W *J clin Invest* 1950 29 849
39 *U S Veterans Admin Quart Progress Report* October 1950 p 23
40 Hart P D Arcy Rees R J W *Lancet*, Sept. 23, 1950 p 391
41 Spain, D M. Molomut, N *Amer Rev Tuberc* 1950 62 337
42 Green H N *Brit med J* 1950 I 1165

without blindly risking a catastrophe How about Addison's disease? Cortisone in small doses is said to be highly effective in this syndrome, in conjunction with deoxycortone and/or supplementary sodium chloride [43] A careful watch should be kept on the progress of the tuberculosis, where that is the presumed cause of the Addison's syndrome, while cortisone is being given, even if the symptoms of adrenal cortical deficiency are relieved

These remarks on cortisone probably hold good for the various crude extracts of adrenal cortex now on the market, some of which contain cortisone, though in very small amounts

Annotations

R H B AND H M C

IN a short circular addressed to regional hospital boards and hospital management committees [44] the Ministry of Health explains that its resumption of the duty of approving hospital estimates, announced earlier this year, "in no way derogates from the responsibility of the boards." It is not perhaps surprising that there has been misunderstanding, and there seems to have been some difficulty in the background which the present circular does not bring clearly into the daylight It appears to place the boards in what must seem to the outsider a somewhat unenviable intermediary position

> 'It is one of their primary functions to plan and supervise the provision of services, and therefore to assess the relative merits of various developments in their respective regions in accordance with broad considerations of regional planning As a part of this duty the Minister relies on them to scrutinise closely and, if necessary, revise the proposals of the Committees for maintenance expenditure and thus prepare for him reliable estimates on the basis of which the national position can be assessed and brought under review with other claims upon the budget

After referring to the increase in knowledge and experience of financial control which has now come about, the circular continues

> It should now be practicable by coöperation between officers of the Ministry and representatives of the Board to make a sound assessment of the claims of the various hospital units in the service In the situation now prevailing this offers the best prospects of an equitable distribution of whatever proportion of the national resources can be made available for the purpose '

The circular seems therefore to mean that the Ministry, having tried entrusting the approval of H M C estimates to R.H.B s, and then having gone into reverse, has not found either plan altogether satisfactory, and now wishes itself to settle the figures, but in discussion with the regional boards

Have we yet found a really satisfactory system for handling these matters? There is a still growing volume of opinion in the hospitals that the whole present set up, based on the submission of estimates under headings and their subsequent pruning, whether it be at regional or Ministry level, or both, is ill adapted to the needs of the service Among the numerous difficulties is the lack of a clear distinction between the responsibility of the H.M C itself for maintenance, and the responsibility of the R H B s for planning and assessing the relative merits of developments" in their regions In the context of this circular it certainly looks as though the board s responsibility in regard to maintenance is connected with developments" If this could be clearly established and defined, and per contra, the responsibility of securing economy in current expenditure could be achieved by some other means, a great improvement might be wrought The possible alternative of letting H M C.s carry the whole responsibility for the allocation of current expenditure, subject only to some central supervision of totalled figures by the Ministry, might well be tried in some selected region If it were successful it might open the way on the one hand to round sum allocations for maintenance purposes which the H M C s could use at their own discretion and to their own great satisfaction, and, on the other, to clarifying the functions of the boards They might then be able to deal faithfully with planning and supervision and with those aspects only of expenditure which are directly connected with "developments"

If confidence in the R H B S shows signs of ebbing a little, this is probably due as much to their inability to give adequate attention to "developments" as to any other factor They need time and opportunity to take each item at leisure and on the spot, and for their senior officers to prepare considered reports which really do justice to the complicated situations with which they have to deal If, as one is sometimes given to understand, the "developments" of a particular hospital management committee have to be bunched together, and taken almost en bloc, this kind of thing is not possible The fact of the matter seems to be that in this sense the regional boards are being asked to do too much If it is practicable to release them from responsibility for maintenance they may yet make the planning and supervision, which is their primary task, a real success

IN THE AMERICAN HOSPITAL

THE technical and administrative sides of nursing need an ample supply of well educated women, and in the United States ways are being sought to attract such women by absolving them from constant personal attention to patients, which many find irksome Division of labour has, indeed, already been carried a long way, and on his visit to the U S A Mr S W Barnes,[1] house governor of King s College Hospital, found as many as six categories of nursing personnel sharing the general ward duties performed by nurses and sisters in this country Supervision and administration lay with the professional nurse, who might have had 3–5 years' training, but this included little 'bedside nursing," most of which was carried on by "practical nurses" with a year's training, or by nursing aides" starting with 3–6 weeks' experience Supernumerary student professional nurses acted as assistants to the professional nurses and finally the dietitian and housekeeper were responsible for food services and cleaning respectively Mr Barnes does not suggest that British nursing should develop along these lines, on the contrary, he urges that more attention be paid to the comfort and convenience of nurses so that the profession shall continue to attract women who will carry on the best traditions of British nursing He recommends the complete abolition of the two shift system, and suggests that the working hours of ward sisters be reduced He is particularly anxious that accommodation for nurses should be greatly improved and points out that the provision of private bed-sitting rooms for junior nurses and separate sitting-rooms for senior nurses is preferable to providing numerous common rooms and lounges for general use

Mr Barnes also makes some pertinent comments on British hospital catering, which compares very unfavourable with the corresponding American services In the U S A, the hospital dietitian is responsible for the purchase, preparation and supply of all hospital meals and not simply (as in this country) for special diets American hospital meals are more varied, more tasty,

43 Carlisle J M. *Ibid*, ii 590
44 Circular R H B (50) 109 H M.C (50) 10,

1 Report After Visiting Hospitals in the United States and Canada Obtainable from the house-governor s office King's College Hospital Denmark Hill London S E.5 Pp 33 1s

and more nutritious than those served in British hospitals, and since the American cooks and kitchen staff are in no way superior to their British counterparts, Mr Barnes regards the greater influence of the dietitian as the deciding factor

DIAGNOSIS WITH TUBERCULIN

TUBERCULIN tests are not as nearly infallible as is often supposed In a discussion not long ago at the Mayo Clinic, Stilwell[1] said that the "single strength" tuberculin test in which 0 0001 mg of PPD (purified protein derivative) is used on patients sixteen years of age or over should reveal 95% of cases in which significant tuberculosis is present About a third of adults who react negatively to this strength are positive to the second strength dose, but "an appreciable number of the reactions may be non specific in nature"

The degree of accuracy of the test has of course been of great moment to those engaged in eradicating bovine tuberculosis In discussing this subject Gregory[2] states that in a recent series in Australia about 5% of non-reacting animals were found post mortem to be tuberculous, while 10% of the reactors had no apparent lesions Many attempts have been made to improve the specificity of the test, and in this country the comparative test is used, in which the reactions produced by the injection of avian and mammalian tuberculosis are compared[3] In the Stormont test, developed in Northern Ireland, a second injection is made, seven days later, into the site of the original injection In 300 cattle tested and killed in Australia the total error made up of false positive plus false negative reactions was 15 3% with a single intra dermal test, 12 3% with a comparative single intra dermal test, and only 1 7% with the Stormont test

The very simple tuberculin test is a most valuable epidemiological tool in investigating tuberculosis, whether in man or animals But, remembering the complexity of the allergic state, one should not be surprised if it gives the wrong answer in some individuals

ONE BLIND EYE

UNTREATED squint is the principal cause of monocular blindness in Scottish school children This finding[4] is based on the examination of nearly 219,000 school children, of whom 1713 came within the definition of monocular blindness accepted for the purpose—an incidence of 8 per 1000 There was a steep rise in incidence with advance of age, the figures being 4 4 per 1000 among entrants, 8 among intermediates, and 11 6 among those leaving school Squint was responsible for just over half the cases, amblyopia for about one sixth, among the rest, the main factors were congenital defect and trauma An attempt was made to obtain similar information about the adult population, but the variation between one group and another was so great as to render the figures valueless

The incidence of monocular blindness which the inquiry revealed is higher than might have been expected, but this is partly explained by the definition of the condition laid down by the committee—corrected vision of 6/24 or less in the affected eye, 6/12 or better in the other This is not a definition which is generally acceptable, and it seems a pity that the recognised standard of blindness (6/60 or less) was not applied On the whole, however, the picture presented by the report is encouraging, for it shows that a high proportion of monocular blindness is easily preventable The increase of incidence with advance of age may be due to environmental stresses, but is possibly another example of the effect of the improved care of the last decade from which the younger children in this survey would have benefited more than the older ones

HEREDITY AND ENVIRONMENT

LAST Monday fellows of the Hunterian Society decided by a large majority that "Heredity is more Fateful than is Environment" Opening the debate, Mr J H Doggart suggested that geneticists had been ill served by their friends, who in their enthusiasm had unduly decried the influence of environment Further damage had been done by the cruel and unscientific use to which the Nazi régime had put racial theories Nevertheless, heredity was important Consider, for example, the ancient Greeks, who had something denied to neighbouring peoples There was no facile recipe for producing genius, and perhaps this was just as well, for geneticists were inclined to say that genius did more harm than good Mr Doggart supported his argument by citing an English family which had had more than its share of eminent members, and also the similarity of uniovular twins—though doubtless the proponents of the environmental theory would attribute this to intra uterine environment Like Mr Doggart, Mr John Eastwood, K C, was convinced of the supreme importance of heredity Certainly, however, in his experience as a Bow Street magistrate, environment was sometimes the predominant factor because of the housing shortage marriages were being disrupted unnecessarily, and young men were sometimes going wrong because they had too much money in their pockets As to heredity, he had been impressed by the number of cases in which the medical evidence was of a schizoid tendency and borderline mental defect and there was a strong family history of mental disorder Mr Eastwood was also convinced that different types of crime were committed by citizens of different nationalities Speaking for the other side, Dr J A Fraser Roberts declared that, as had been done with domestic animals and cattle, the human species could be changed out of all recognition, but this we did not want to do The balance of heredity and environment was not always the same, as environmental circumstances improved, heredity became more important, whereas among backward peoples the influence of environment still far outweighed that of heredity He acknowledged that physical traits and intelligence were primarily attributable to hereditary factors, as also were psychoses, on the other hand, general health, emotion and temperament, and neuroses were conditioned mainly by environment (There might, added Dr Roberts, be fundamental differences between twins brought up together.) Prof J B S Haldane, F R S, supporting the heredity thesis, enjoined caution in judging statistics, he knew, he said, of one family where 30% of the people who had married into it had become mentally ill Nor, he suggested, could heredity be considered in isolation from environment On a good English meadow a Jersey cow might produce up to 2000 gallons of milk a year, while the Galloway on the Scottish moor was yielding only 200 Put the Galloway into the meadow and its yield might double, but put the Jersey on to the moor and it would lie down and die He, too, believed that with a regulated and constant environment heredity was the more important But man's environment was neither regulated nor constant—the expectation of life for the child born in India or China was half that for the child born in England Furthermore, "you will know more about me if I say I was born in Southern England than if I say my father was a professor and not a bricklayer"

DR GÖSTA FORSSELL, formerly professor of radiology at Carolina Institute and director of the X ray department of Carolina Hospital, died in Stockholm on Nov 14, at the age of 74

1 Stilwell C G *Proc Mayo Clin* 1950 25 422
2 Gregory T S *Australian Vet J* 1949 26 138
3 See Francis J Bovine Tuberculosis London 1947
4 Report of a Subcommittee of the Scientific Advisory Committee to the Department of Health for Scotland H M Stationery Office 1950 Pp 24 6d

Special Articles

RESEARCH ON BURNS

An American Symposium

FROM A CORRESPONDENT

AT the opening of this symposium, held in Washington on Nov 2–4 by the National Research Council, Dr M C WINTERNITZ, chairman of the council's division of medical sciences, remarked that work in this field went beyond surgery, needing a combined approach by physiologists, chemists, and physicists as well as clinicians

SCOPE OF THE BURN PROBLEM

Dr EVERETT EVANS, chairman of the council's sub committee on burns, said that at Hiroshima blast caused 45% of the casualties, thermal effects 40%, and radiation effects 15% With modern phosphorus and petroleum types of bomb 59% of deaths are due to burns, while 25% are due to blast. He drew attention to the serious nature of combined injuries, especially when blast or thermal injuries are combined with exposure to ionising radiations, even in low dosages

RADIATION COMPONENT OF ATOMIC BOMB EXPLOSIONS

Dr WILLIAM T HAM, jun, said that in above ground A bomb explosions, 2000 ft is the most destructive level The thermal hazard is not serious in ground and below water level explosions In plutonium fission some 60 types of radiation products are released Very little radiation escapes at first, because of local absorption, only 3% of total radiation arrives during the first $^1/_{100}$ second The "mushroom" goes up at 300 ft per second It takes 60–100 seconds for the total γ radiation to reach 4200 ft from the bomb γ rays passing through matter are continuously degraded in wave length, 16 in of water reduces these rays to $^1/_{10}$ of value, and 20 ft of concrete at 400 ft from source will reduce 400 r to 20 r Fission neutrons are mostly captured in the immediate vicinity of the explosion, only a small percentage is thought to become a radiation hazard The neutrons released are either "prompt" or "slow" There is no information yet regarding lethal dose of "prompt" neutrons Absorption of neutrons of both types is probably fatal at 3000 ft from the bomb Dr Ham noted the high incidence of cataract amongst cyclotron workers, 200 rep of "prompt" neutrons produces a cataract Therefore cataracts occur at 1900 ft from the bomb, but in Japan cataract has occurred at 3600 ft At 4200 ft the M L D of γ radiation is 900–1000 r, and of neutrons it is 3600 rep

Commander E P CRONKITE stated that certain biological phenomena observed after ionising radiation are inconsistent with the known physics Thus the exposure of 7 M eV necessary to produce epilation greatly exceeds the diffuse radiation exposure known to cause death Shielding—for example, of the spleen—can increase tolerance to exposure Considerable protection is afforded by getting behind the concrete in the first 30 seconds after the explosion

PHYSIOLOGICAL PROBLEMS CONCERNED WITH FLAME THROWERS

Dr JAMES M WALKER said that in the late war deaths after exposure to flame throwers occurred for the most part within minutes Patients with severe total body burns may live some hours, but death may take place very quickly with slight external burns, these deaths are thought to be due primarily to heat, but decrease in oxygen tension and increase in carbon monoxide are also important

Experimental studies of petrol burns in pigs (sometimes with the body but not the head exposed to heat) have shown that death can take place through three mechanisms (1) hyperthermia, (2) hyperthermia plus cardiac failure, and (3) cardiac arrest due to the release of concentrated potassium ions from hæmolysed red blood cells

In flame throwers the temperature may go up to 1000°C There is a difference between the effects of hot dry air and of hot air plus steam, since steam produces pulmonary œdema as well as burns of the upper respiratory tract There are also differences between the effects of static flame and of high velocity flame The deaths in Japanese bunkers attacked by flame throwers were, therefore, studied with special attention to carbon monoxide poisoning and low oxygen tensions Experiments with goats in bunkers and in slit trenches showed that with 34% dead on open ground only 2% were dead in trenches These dead goats showed only slight external burns, but carbon monoxide poisoning and low oxygen were not sufficient to account for the deaths A third of the animals showed evidence of laryngeal obstruction, the deaths were therefore ascribed primarily to hyperthermia In bunkers, after exposure to 800°C, some animals had potassium effects on the heart

When flame throwers are used on bunkers with temperatures up to 400°C, oxygen lack and toxic absorption of products such as acetaldehyde are important, as is carbon monoxide increase If water is on the floor, steam can produce laryngeal and pulmonary œdema Lethality is increased by combination of all factors—i e, heat, low oxygen, high carbon monoxide In goats a 70–80% surface burn at 700°C will produce a "potassium death"

LABORATORY PRODUCTION OF HIGH AND LOW TEMPERATURE BURNS

Dr HERMAN E PEARSE pointed out that evaluation of experimental high temperature burns is by description of gross pathology only We have not yet a quantitative yardstick to assess biological effect An attempt has been made to reproduce the thermal component of an A bomb —that is, a high quick release of energy attenuated by passage through atmosphere Dr Pearse referred to the effect of fabrics, both in protection and as a danger in causing secondary burns on ignition Experimental sources of heat are (1) electrical discharges, (2) ignition of thermite or magnesium, and (3) constant source of heat from a carbon arc, or the sun (by mirrors) No method is ideal There is need of further research for precise knowledge of depth of tissue penetration, and of energy emitted

Dr W J H BUTTERFIELD described work in Britain since 1947 on the thermal effects of A bombs, and means of protection and treatment This research had been directly concerned with spectral range, clinical course, and healing times The experimental material had been the bodies of the workers themselves and of volunteers among co workers The threshold of response was related to area exposed, the larger the area, the lower the threshold The red part of the spectrum was believed to be more important than ultraviolet light as a source of A bomb burns Infra red rays, produced by a coal gas machine had been applied to areas of skin of 5, 3, and 1 sq cm, with the source of heat at a distance of 11 cm for 1 1 seconds This exposure was thought to equal the thermal component of an A bomb at 4500 yards from the hypocentre The clinical course of the burn was plotted There was erythema, dull pain, œdema, and blisters which went on forming for up to 24 hours Desquamation occurred at 7–10 days, healing was complete at 14 days there was some late pigmentation On exposure of 1 3 seconds to 4 calories burns with full thickness skin loss were caused Such full thickness skin burns might be expected at 3100 yards from an A bomb, at 4800 yards

only erythema would be expected The wider the area exposed, the lower the threshold A bomb heat rays were rectilineal, most exposures would be glancing, and therefore less severe for the given distance Dr Butterfield also described the results of white light burns, whose clinical course differed In the absence of infection, healing and distance from the A bomb bore a linear relation to each other If there were 1000 people per sq mile in a city exposed to an A-bomb, 1600 could be expected to be exposed within a radius of 3000 yards, this would result in incapacity amounting to 150,000 man days, provided the burns healed without infection

Dr Butterfield emphasised that his experiments were not concerned with the constitutional effects of the burns, but solely with the local lesion, and in particular with obtaining precise information about extent and clinical course of lesions produced by measured exposures in known lengths of time which were related as closely as possible to the presumed exposures to the thermal component of A bombs

Dr JAMES W BROOKS described the results of standard burns produced by relatively low temperatures at long durations Area and depth were constant, healing was spontaneous and was not associated with serious infection The lesions were produced on the trunk not near orifices, dogs were used as their response to burns is similar to that in man Deep second degree burns were produced By means of a formula the exposure to produce a 20% body surface burn could be measured accurately Healing was by marginal ingrowth after separation of sloughs, which was accelerated by the dog licking the lesions, it was complete, on average, by the 42nd day The effects included falls in hæmoglobin percentage and in protein in the first hour, and 25% decrease in cell mass due to enlargement of spleen under sodium pentobarbitone After 20 days there was a gradual rise in hæmoglobin, red blood cells, and blood protein during the healing phase

The experiments were then repeated, the dogs now being given, in addition, 100 r total body radiation from 1·M eV source at 30 r per minute In a third experiment only the radiation of 100 r was given Studies of hæmoglobin, red and white blood cells, and plasma protein showed little difference between the different series in the first 24 hours But the anæmia was more rapid and more severe in the group both burnt and irradiated, the white cells remained steady for 6 days and then dropped rapidly by the 12th day, in this group blood cultures became positive, mostly with streptococci, by the 12th day Necropsy showed little change in intestines, the bone marrow showed a great drop in all cellular elements (in the fatal burns without irradiation the bone marrow showed a myeloid preponderance)

Other experiments with different dosages were described Exposure to 25 r plus a 20% thermal burn caused leucopenia starting on the 10th day, as opposed to the 6th day when the exposure was 100 r The mortality for each group was as follows 20% burn, 13%, 20% burn plus 100 r, 75%, 20% burn plus 25 r, 33%, 100 r alone, 0%

FLUID AND ELECTROLYTE REQUIREMENTS

Dr DONALD D VAN SLYKE emphasised that shock is due to loss of blood, plasma, and electrolytes, and it is best combated by replacement of these The chief problem is to find a replacement fluid for plasma and blood, for which the demand would be too great

Electrolytes and Water—Dr OLIVER COPE pictured the burn wound as a parasite on the surface of the body Of all local measures, only two are certain to limit needs of fluid by reducing local loss these are pressure and cold Recently there has been evidence that ACTH might also do this The object is to replace in the rest of the body the fluid lost in the wound Thermal wounds swell rapidly owing to capillary permeability and arteriolar dilatation, with increase in rate of blood flow through the affected part Volume loss is proportionate to area and mass of burn, it is limited by the rising intercellular pressure in the burnt areas The protein content of the burn bleb is at first 3–4 5 g per 100 ml., and with healing falls to 2 g per 100 ml at 7 days There is a great increase in lymph drainage and in the protein content of lymph from the part Local œdema reaches a peak at 36–42 hours At 48 hours the capillary membranes become less permeable, the lymph drainage rate is high, therefore œdema starts to subside rapidly at this time, circulation and kidneys must rid the body of this excess fluid Unburnt areas of the body are dehydrated, so that all lymph flow from them ceases. If the burn is not fatal, fluid redistribution takes place

Plasma provides water and electrolytes, but too much protein, it is therefore a good, but not an ideal, infusion agent for burns The object should be to give colloids and electrolytes in the volume necessary to replace that lost in the burn, locally pressure dressings are applied to restrict local volume loss, for unsupported burnt areas develop "puddles" Pressure is a useful adjunct Cold can also limit local loss by reducing capillary flow

This plan of therapy based on expected volume of space enlargement is still experimental Fluid should have both colloids and electrolytes plus water for renal function "The percentage body surface affected formula is best for planned therapy," provided it is adjusted up and down in accordance with the needs of the particular case The need for fluid is greatest in the first 1–8 hours after burns The rate of renal output is the best guide to the rate of fluid administration Dr Cope especially stressed that fluids must be sharply curtailed 36–48 hours after the burn

Dr O J PURNELL declared that lives may be lost by pulmonary œdema or by anuria In children and the very old it is particularly difficult to assess fluid requirements, if too much is given, fatal pulmonary œdema ensues on the 3rd–6th day 15 ml. of blood plus 15 g electrolyte for each 1% surface area burnt is the formula that has been used, but this may be too much Dr Purnell now gives 2 6 ml per kg body weight per 1% of surface area burnt on the first day, and 1 6 ml on the second day He believes that the customary formula of 50–100 ml per 1% body surface burnt may be too little and lead to anuria He therefore suggests 1 ml plasma per 1% per kg, plus normal electrolyte solution of 1 ml per 1% per kg, plus water up to 2000 ml in 5% glucose Not more than 3000 ml. of electrolyte or plasma is given per day, there should be an excretion of 50 ml of urine per hour He never gives more than 10,000 ml of all fluids in the first day Sometimes death takes place even with a good urinary output

Giving colloids, fluid, salt of 1 ml per each 1% surface area burnt per kg body weight, plus 2000 ml of water by mouth, followed by half this amount on the second day, Dr Purnell has had no cases of pulmonary œdema or of anuria This means an upper limit of 3000 ml each of colloid fluid and of salt fluid If more is given, pulmonary œdema is caused

Albumin, Plasma, and Whole Blood—Prof DICKINSON W RICHARDS, jun, described a study of the circulation of 200 cases in the acute stages of burn and traumatic shock Blood volume, right auricular pressure cardiac output, femoral artery pressure, and peripheral resistance were measured in each case With burns there was a fall in the cardiac output, less fall in the right auricular pressure, and a rise in the peripheral resistance to above normal This picture did not explain the deterioration in these patients The disorganisation of circulatory dynamics was not propor

tionate to the local conditions These measurements were made following the administration of blood and saline Administration of blood increased the cardiac output, the oxygen pressure, and the pressure in the right auricle Concentrated albumin fluid had the same effect, but to a smaller extent Saline had an even less marked and a more transient effect

Dr CARL A. MOYER had tried to produce the thermal injury experimentally so that it could be studied like a pharmacological problem—that is, what thermal injury would have an M L D of 100% in 8 hours? He found that all dogs scalded to 60% surface with water at 85°C for 10 seconds died in 5–6 hours. He did a series of controls and then a further series after "loading" the dogs about to be burnt with various types of fluid Dogs loaded with saline, bicarbonate, and blood mixture showed a great rise in the proportion surviving for 60 hours Animals given blood and allowed to drink salt water survived 80 hours Dr Moyer underlined the importance of loss of red blood cells into the dilated capillaries of the burnt area, and of the slow blood flow there He regarded the urinary output as an important guide to rate and amount of fluid administration, but added that patients do not respond uniformly

Dr Moyer gave the results in a series of burns treated in Dallas, Texas, all with involvement of 30% or more of the body surface In 1944–46 cases were treated chiefly by plasma, 3–12 litres in 12–36 hours, plus water by mouth. The 1947–49 group were treated by blood plus salt water by mouth In both groups age had a very adverse effect, no patient over 60 survived with more than 30% body surface burnt Four patients had been seen comatose with very tight trunk dressings, they had recovered consciousness when these were released Dr Moyer referred to the difficulty in taking fluids by mouth with burns of more than 30% of the body surface, the stomach emptied very slowly when shock was present

Dr ARNOLD M SALZBERG had estimated plasma-volume by the T1824 dye technique The red cell volumes were estimated by the plasma volume/venous hæmatocrit formula The red cell volume was also estimated by means of radioactive phosphorus (P^{32}) In dogs standard burns were inflicted by exposure to 60°C for 1 minute to 20% body surface The red cell count by the P^{32} technique differed from that by the plasma volume/venous hæmatocrit technique formula The reasons for the discrepancy lay in the error in the venous hæmatocrit reading which was influenced by variations in individual red-cell volume It was therefore thought that the dye technique did not yield accurate data for replacement therapy After the primary phase the replacement therapy demanded the giving of blood, if the P^{32} readings were correct

Large amounts of whole blood in the first 24 hours helped healing and prevented late anæmia, the initial loss of red blood cells accounted for much of the late anæmia

Globin—Dr MAX M STRUMIA held that, when oral feeding is impossible, globin is a valuable substitute for protein feeding, it is indeed a good replacement material when plasma proteins are lost from any cause Globin is readily metabolised, a 4% solution is isotonic with 7% plasma protein Globin is a salvage material obtained from discarded red blood cells, 40 g is obtained from 500 ml of blood.

Dr ROBERT B PENNELL said that with Dr Strumia's method of manufacture from unwashed red cell residues (of any blood group), the globin product is stable for years when dry or in solution, it is free from antigen, it can be used in strengths of up to 16% without toxic reaction It contains no potassium but some iron and some calcium A study of the use of modified globin in burns has shown that it is a valuable substitute for plasma in the treatment of shock At the moment it affords the only possible means of salvaging outdated red cells

Dextran—Dr GUNNAR THORSEN (Stockholm) described six years' clinical and experimental experience with dextran Urinary excretion is proportionate to the molecular weight of the dextran used and the total volume given When ½–1 litre is given, nearly all is excreted in 2–4 days, but some remains in organs such as the liver 1 g of dextran binds 23 ml of water Dextran does not cause anæmia, the bone marrow of patients receiving it shows no abnormal cells The critical molecular weight is slightly above that which is filterable through the kidney, the molecules should be large enough to stay in the blood without causing sludging The only complication of importance has been some collapse and substernal pain in 0 02% of cases In burns dextran is as good as plasma, in the early phase 1 litre of 1% dextran is given alternately with 400 ml. of blood There have been no cases of "wet" lungs Dr Thorsen especially emphasised the value of dextran as emergency treatment in the field or in outlying hospitals

Dr J P BULL (Birmingham) gave an account of experience with dextran in the Medical Research Council's burns unit The large molecule polysaccharide used commercially has to be broken down by hydrolysis Dextran molecules are made up of glucose with 1–6 linkages, these break down slowly and are in the circulation longer than one would expect Dextran is given in the first 24 hours after the burn, blood is given later The amount given is determined by hæmatocrit readings Dextran can be swapped bottle for bottle with plasma In an adult, about 1 litre of plasma is given for every 10% of body area burnt, plus sodium lactate by mouth. If a lot of dextran is given, plasma proteins fall (in one patient, who died, to 3 g per 100 ml.) In neither patients nor animals has there been evidence of toxicity or of pyrogenic or antigenic activity In the body dextran has a half life of 40 hours About 30% can be recovered from the urine The fate of the rest is uncertain but after some months the organs contain no substantial amounts, it disappears last from the lymph glands Dr Bull remarked on the difficulty that dextran may cause in cross matching of blood because of its tendency to provoke rouleaux formation, patients who may need blood have samples taken for cross matching before any dextran is given.

Gelatin—Dr J L ONCLEY discussed the preparation of degraded gelatins suitable for use as plasma substitutes Ossein gelatin is degraded into a series of shorter chains, the shorter the chain the lower the molecular weight D gelatin is that most often used clinically, it is characterised by viscosity and by its osmotic effect Degrading may be done by different methods

Prof I S RAVDIN described clinical experience with gelatin over the last nine years in Burma, India, and America He has used the P20 gelatin in 4% solution He declared that if blood is available there is no need to worry about substitutes for it In burns the need is for a substitute product exerting a colloidal osmotic pressure over hours rather than days, the gelatin solutions are suitable for this. Some degraded gelatins cause serious renal damage, but P20 does not Other drawbacks include lack of homogeneity, and the variety of molecular weights An extensive trial of P20 gelatin has shown it to be very satisfactory when used in a 6% solution, plus other fluids 50% of the gelatin is lost in the urine in 4–5 days The use of low-molecular sizes reduces to a minimum the risk of intravascular clot Professor Ravdin believes that, when given in hospitals, it is as safe as blood

Dr EVERETT EVANS has found P20 better clinically than the more degraded gelatins He has administered

to a child 200–400 ml of 4% solution four times in 24 hours In his opinion, P20 gelatin is clinically an effective plasma substitute for cases of burns

RENAL AND PULMONARY DISTURBANCES ACCOMPANYING SEVERE BURNS

Renal Disturbance—Dr CHARLES H BURNETT said that serious renal insufficiency is rare after prompt full treatment of civilian burns, but after military and A bomb burns it is common Mallory has demonstrated a lower nephron nephrosis after severe trauma, crush injuries, transfusions, and excess sulphonamides There is a shock like state with excretion of myohæmoglobin and hæmoglobin On days 1–6 casts are present without glomerular change, at 7–10 days tubular casts appear

The management is that of acute renal insufficiency of lower nephron type This management comprises (1) re establishment of homeostasis, (2) maintenance of homeostasis during period of oliguria, and (3) maintenance of homeostasis during period of diuresis In burns a special problem is the excess of fluid which has to be got rid of between the 2nd and the 4th days The serum sodium is a good guide to therapy, it may be urgent in the period of change from oliguria to diuresis Deficiency of serum sodium may lead to sudden collapse Acidosis in this phase of oliguria should be remedied by treating the cause, but it is unwise to be too energetic about the correction of the serum carbon dioxide Severe alkalosis may be caused, and be more dangerous and difficult to correct than acidosis During the oliguria only 750–1000 ml of fluid is given The nutrition is maintained by 10–25% glucose At this period an excess of serum potassium may be present, owing to breakdown of red blood cells If the circulation is stabilised protein should not be given during the oliguria, this would increase the serum potassium Dialysis is not generally necessary, but may be valuable in burns with lower nephron failure Once diuresis sets in, extensive depletion of sodium, potassium, calcium, and chloride may occur in the absence of replacement Renal insufficiency is preventible, but with mass casualties acute kidney failure is to be expected The treatment is that of the lower nephron syndrome complicated by the nature of the fluid loss in a burn

Experimental Pulmonary Injury—Dr ALAN R MORITZ said that respiratory tract damage is common in burns and is not proportionate to the extent of the skin lesion Not only heat but also combustion products of any fire can cause pulmonary injury Hot air was delivered into the upper respiratory passages of dogs at temperatures of 350–500°C, from different heat sources, with and without protection of the larynx The dogs were allowed to breath 120 times Early deaths were due to laryngeal œdema, with little changes in the lower trachea or lungs Air even at 500°C is not hot enough to maintain its temperature into the lungs In another series a steam jet was introduced into the lungs When hot air was passed into the larynx a fall in temperature of 350°C to 180°C was observed without pulmonary injury With a flame at 1000°C at the larynx there was severe damage in the upper trachea, some early pulmonary damage, and late bronchopneumonia When steam at 100°C was passed into the larynx 50% of the dogs had moderately severe thermal injuries of the alveoli around the medium to large bronchi Why is it that air hot enough to damage skin does not damage the lungs? It is because the heat capacity of air is $^1/_{4000}$ that of water Only when the temperature of air is high enough to burn skin instantly is the lung tissue affected, and then the lung damage is not incompatible with life Only when the larynx is protected does fatal thermal pneumonitis develop If the larynx is not protected death occurs from early laryngeal obstruction The most vulnerable part of the lungs is the central alveoli, which can show hæmorrhagic œdema when the neighbouring bronchi are unaffected

Respiratory tract Injury in Man—Dr MAXWELL FINLAND recounted experience at the Boston City Hospital of the Boston Coconut Grove disaster nine years ago In this disaster people were confined in a rapid conflagration, there was a big proportion of early deaths At necropsy of the victims the mucosæ of the upper respiratory passages were red, œdematous, and hæmorrhagic, these signs diminished towards the bronchi There was no froth, but a dripping pulmonary œdema limited to the alveoli, possibly due to an irritant and not to the flames

Cases were classified, according to severity of respiratory symptoms, in five groups, ranging from those with a slight cough to those with consolidation plus respiratory obstruction, there was close correlation between clinical signs and X ray evidence of atelectasis and emphysema There was also correlation between the extent of surface burns and the pulmonary findings The deaths were in two groups (1) cases with burns of over 30% body surface, and (2) cases with signs of pulmonary consolidation or of consolidation plus obstruction The obstruction sometimes came on very suddenly, these cases needed most careful watching Administration of fluid was difficult because of the danger of pulmonary œdema Tracheotomy was done in 18 cases, only 3 survived Respiratory obstruction was a major factor in the 39 fatal cases

The nature of the noxious gases was not ascertainable from the patients' history, but in some cases carbon monoxide poisoning was a factor A late follow up has shown no important or persistent damage to lungs in survivors The pulmonary damage in the fatal cases was due to multiple causes, primary and secondary The best management of the chest condition would appear to be comparable to that of children with severe laryngo tracheo bronchitis In the cases seen at Massachusetts General Hospital the pulmonary œdema occurred in waves at 5–24 hours

STRESS, INJURY, AND ENDOCRINE RESPONSE

Prof GEORGE W THORN divided the humoral factors in severely burnt patients into three systems

System A is in the burnt area It concerns the liberation of substances and their action on the kidney and the liver We should note that the rate of absorption of toxins is increased by fluid administration, and we should ask if this is always a good thing System A also stimulates system B

System B is the pituitary action brought into play in response to the toxin from the burnt area, and in its turn stimulating the adrenal cortex, leading to an outpouring of adrenal steroids Is this always entirely a good thing for the burnt patient? And is the output of steroids adequate or optimal? In a state of stress adrenal replacement dosage, if desirable, would have to be very high There is excess 17 ketosteroid and 11 ketosteroid excretion, but what this really indicates is unknown System B is linked with system C

System C is the renal hepatic system This maintains the blood pressure by excretion of pressor substances from the kidney and/or depressors from the liver A fall in blood pressure may be due to excess depressors or diminished pressors

In burns there is intense inflammation ACTH will minimise this, hyaluronidase may be blocked by 'Cortisone' or by ACTH Synthesis of histamine is also reduced Most of the usual body reaction to injury is therefore blocked by giving ACTH

ACTH and cortisone can reduce the fever, but it is uncertain whether this is entirely beneficial These hormones also modify the liver reactions, helping to mobilise fat and save proteins, their effect on blood formation is to cause leucocytosis, they may also prevent

he formation of a pyogenic membrane This probably neans that they should only be used in association with antibiotics ACTH influences the production of hyper-tensinogen by the kidney, in 7–10 days it causes an ncrease in peripheral resistance by its effect on capillaries and arterioles

Patients who have their blood dialysed for 6 hours show a rise in blood pressure even when not previously responsive to pressor substances, depressor substances have therefore been removed by the dialysis Dialysis may be used instead of blood in cases of pulmonary congestion After 6 hours' dialysis the patient may again respond to pressor substances Dialysis is a method with great potentialities. In shock it may possibly be necessary, not merely to *give*, but also to *withdraw*, substances—e g, the depressors secreted by the liver

Relation to Burns—Dr J S L BROWNE (Montreal) said that the adaptation syndrome is the common response to a variety of stimuli The response varies with time, it is also modified by previous stimuli The urinary hormone content is only a rough indication of the hormonal activity and internal balance What is an adequate output of hormones? It varies widely with the state of the organism Both urinary nitrogen and corticoids rise after injury or burns Testosterone checks nitrogen loss, but it may simply be transferring protein from the site of injury to other parts Continuous ACTH will cause a rat to lose weight and die in 9 days with all organs showing a lowered nitrogen content, and patients in trauma are already in negative nitrogen balance It should be noted, too that different tissues have different capacities to seize nitrogen

When a patient with burns receives 1000 mg of ascorbic acid, none appears in the urine for some days and the blood level remains low The effect of ACTH is to cause vitamin C to appear in the urine when administered in heavy doses This phenomenon has great potential value Homografts persist for at least 140 days when ACTH is administered

Metabolic Response to Thermal Injury—Prof FRANCIS D MOORE suggested that a thermal burn is a disease with a natural history and a characteristic succession of events With plasma therapy the patient is put in positive nitrogen balance, then high nitrogen excretion follows with a negative nitrogen balance, before return to a positive nitrogen balance with healing There is a short period of potassium loss, and often a period of notably positive sodium balance This may be due to corticoid production and secretion Other factors are immobilisation and starvation, starvation is the more important Professor Moore's estimate is that $^1/_5$ of the response is due to immobilisation $^2/_5$ to starvation, and $^2/_5$ to endocrine reaction In a burn the negative nitrogen balance can be checked by late loading with protein, and the negative potassium balance by early loading The early endocrine picture is that of extreme adrenal stimulation going on to exhaustion, this points to the need of ACTH In some cases 300 mg cortisone is given for the first 3 days then 120 mg ACTH daily 2 mg of cortisone does not interfere with the healing of a herniotomy wound relatively enormous doses of ACTH are needed to interfere with the healing of experimental wounds The caloric deficit is treated by fine fat emulsions (of coconut oil) given intravenously

TREATMENT OF THE BURNT AREA

Closed dressing Principle—Dr HARVEY S ALLEN reported on 955 cases admitted to hospital since 1938, with a mortality of 1 78% The routine is to cleanse the burn with saline and to treat the shock by fluids Locally a pressure dressing is applied for 6–10 days. Sloughs are then excised and grafts applied forthwith, or 4 days later if oozing is heavy In 45% of children the wounds were closed in two weeks, and in 86% in three weeks. Pressure dressings are regarded as important, they must be of large resilient material with a close mesh underlayer, and must act as splints Antibiotics are used only for established infections Of this series, 30% showed clinical shock on admission, 25% needed grafts, and 17% needed excision of dead tissue In 44% grafts were applied within 2 weeks, and in 85% within 3 weeks Dr Allen emphasised the importance of this early grafting "The impetus to heal is quickly lost I do not believe that we can apply drugs to a wound and expect healing"

Dr BULL said that the pressure exerted by properly applied pressure dressings ranged from 30 to 50 mm Hg

Mr PATRICK CLARKSON (London) drew attention to the dangers of pressure dressings applied to the neck, especially in burnt children He has had some experience of the exposure method, and has found its practicability in the treatment of superficial burns in general hospitals a great asset He complimented Dr Allen on his success in reducing mortality in such a large group, including many of the most severe types, to 1 7% This, he is sure, is the result, not only of Dr Allen's exceptional skill in the operative handling of these difficult cases, but also of his energetic plan of management, by which he excises the sloughs and provides a free graft cover for over 80% of his cases within the first 10–20 days This is a most exacting programme, but its successful accomplishment obviates many problems

Exposure Method—Lieut Colonel EDWIN J PULASKI referred to the reintroduction of the exposure method of local treatment by Wallace in 1948 The object of this method is to obtain and maintain a dry surface after cleansing with a detergent The affected part is elevated and immobilised The area of full-thickness skin loss is excised after 20 days and grafted. Results obtained by the U S Army in Texas confirm for adults in a semi tropical climate Wallace's findings in Edinburgh The advantages of exposing the burn area are as follows there are no pressure dressings, which are difficult, dangerous and time consuming to apply, the marginal skin is rarely macerated or lost by secondary infection; there is no odour there is a short period of pyrexia, nursing care is reduced, healing times are short, and grafting is less often needed Exposure is a hospital procedure, and not for outpatients, it is probably unsuitable for circumferential burns because parts of these are in contact with the sheets The method is particularly suitable for 'burns of the face and neck and of the perineum, and for unilateral burns"

Mr A B WALLACE (Edinburgh) reviewed experience of over 300 cases treated by this method during the past three years His treatment of burns is by "controlled fluid therapy and local care" Clinical signs—thirst pallor restlessness—precede blood-changes and are indications for intravenous fluid. Tables of normal hæmoglobin percentages, hæmatocrit readings, and urinary output for different ages are kept and are constantly referred to when assessing fluid needs. Fluid replacement is based on age and the estimated percentage body surface burnt in accordance with a chart which has been constructed in his department (The water, protein, and electrolytes in this chart for fluid replacement are very similar to the figures arrived at independently and from different evidence by Professor Evans in the U S A)

Cultures of the exposed burnt area have never shown growth of hæmolytic streptococci, proteus, or *Pseudomonas pyocyanea*, though these organisms were often demonstrable in the air of the ward Mr Wallace compared 100 cases treated in his children's ward by exposure of the burns with 100 cases treated earlier by pressure dressings Of the exposed cases 9 needed

grafting, of those with pressure dressings 27 needed grafting None of the exposed patients had fever for 1–6 weeks, 34 of the patients treated with dressings had such a fever, and 5 of this group had streptococcal rashes, which were entirely absent from the exposed group

Mr Wallace said that the exposure method is used by him as a means to an end—this end is to obtain a dry skin with maximal preservation of the skin's natural property of resistance to infection He believes that a dry skin could probably also be obtained by an absorptive dressing In his view the term "pressure dressing" is wrong, it should be replaced by the term "absorptive dressing" The two methods—exposure and absorptive dressings—are complementary rather than mutually exclusive There are indications for the use of each

INFECTION IN SEVERE BURNS

Mode of Infection and its Control—Dr LEONARD COLEBROOK, F R S, reviewed his very extensive experience while in charge of the M R C burns units in Glasgow and Birmingham The Glasgow burns were treated largely without antibiotics

"The bacterial factor is the biggest in severely burnt patients" 90% of severe burns are complicated by infection, which postpones grafting and healing and causes unnecessary disability and unnecessary deaths The tradition that in severe burns infection is inevitable is wrong infection can be avoided Today many cases of 60–70% body surface burns recover Dr Colebrook reserved his judgment of the exposure method of treatment

In Birmingham the policy was to regard all burns as liable to infection and needing treatment under a microbe proof barrier This meant doing all dressings in a room with sterile air, and the use of topical penicillin Dr Colebrook showed slides demonstrating relatively simple air conditioning apparatus, whereby an effective rate of air replacement from above down at 20–30 replacements per hour ensures a virtually sterile environment within the dressing room The value of this sterile air has been difficult to assess, because a strict dressing technique and topical penicillin were used concomitantly But the over all effect of these three factors was most striking Thus, in Glasgow, without the dressing room, the infection rate with hæmolytic streptococci was 30%, at Birmingham it was less than 5% At Birmingham, too, many burns were kept completely sterile for 2–3 weeks The average stay in hospital has been reduced by 50% Clinically pain has been largely eliminated, and throughout treatment the morale of patients is good

Dr Colebrook made a special plea for the establishment of burns centres in all large cities About 100 beds per 1,000,000 population are necessary in England, in the U S A burns are about twice as common, and 200 beds per 1,000,000 are probably necessary He also drew attention to the possible conversion, for war purposes, of ambulances into mobile dressing rooms with sterile air produced by air conditioning at a high rate of air replacement Another urgent need is the determination of a simple dressing (to be left on for a week) for hand and face flash burns

Dr Colebrook declared that, in the event of mass casualties, streptococcal infection might again be seen in its old, dangerous, and epidemic form Our present relative freedom is due to penicillin, to small numbers, and to conditions of treatment which could not be expected to prevail with mass casualties

Antibiotic Therapy—Dr WILLIAM A ALTEMEIER said that the majority of U S doctors prefer systemic to topical penicillin Each antibiotic has a limited antibacterial spectrum Penicillin has the widest range, chloramphenicol the next widest, and then 'Aureomycin' and 'Terramycin' Terramycin is effective against the highest percentage of cocci and gram negative bacilli, this is to be expected since it has been used only for a short time Antibiotics are only a temporary measure in the control of infection in deep burns, these need surgical removal of the sloughs and a graft cover

NUTRITIONAL CARE

Burn Anæmia—Prof G WATSON JAMES outlined the biochemistry of the formation of hæmoglobin from a globin and from an iron containing hæm fragment On breakdown the iron is retained by the body, the pigment excreted The progenitor of the red cell is the site of the synthesis of hæm and globin into hæmoglobin The resources for this are brought to the cell by the plasma If the plasma protein (including glycine) is low there is normoblastic arrest Any disturbance of porphyrin metabolism probably indicates severe disorder of red cell metabolism He drew attention to the large amount of red cell mass that disappears after the dressing of extensive burns In burn anæmia the hæmoglobin tends to settle at about 8–10 g per 100 ml He concluded that the anæmia requires, for its radical treatment, the removal of dead tissue and healing by grafts

Nutritional Care—Dr STANLEY M LEVENSON spoke of the adverse effect on nutrition of combined radiation and thermal damage Routes of feeding are by mouth, stomach, jejunum, or vein Optimal amounts have not yet been determined, but high intake in the first week is always beneficial The most useful diets are liquid, given as regular small feeds, with a calorie content of 3500–5000 and protein totalling 100–250 g (When milk is the major protein source, there may be danger of calculi) A thin plastic nasal tube may be left for up to 5 months, with weekly removal for cleaning, this permits administration of protein in the form of unpalatable liver feeds 20% of calories should be from fat

Dr FREDERICK J STARE declared "I do not know what an adequate calorific intake for a severe burn is" A fine emulsion of coconut oil, in addition to providing calories, confers efficiency of utilisation on other elements in the diet The average particle is $^1/_2$ μ, none is larger than 3 μ With oral administration all the fat is absorbed, none is recovered in the fæces The emulsion is palatable and can be used as a solvent for vitamin K (When so combined and given intravenously, it can correct the effects of dicoumarol in 12–24 hours) The emulsion is out of the blood stream in $3^1/_2$ hours When tagged with radioactive C^{14} the carbon can be detected in expired air within 2 minutes of being injected 1 litre, carrying 3200 calories, can be given in half an hour, up to 5–6 g of fat per kg body weight per day is given A glassful of the fat emulsion taken orally gives 1500 calories

EARLY DEBRIDEMENT OF BURN WOUNDS

Pyruvic Acid—Dr SAMUEL C HARVEY stated that pyruvic acid acts on the slough not digestively but rather as a physiological accelerator of the normal process of autolysis and separation

Streptokinase and Streptodornase—Dr WILLIAM S TILLETT said that the effects of these enzymes are proportional to the amount of substrate against which they are active Streptokinase is active against fibrin and globin, streptodornase against nucleotides, which form most of the solid component of pus Both need serum for activity, this is absent in dry sloughs Both cause proteolysis and liquefaction They are not effective against collagen The extensive slough of a burnt leg was "cross hatched" by incision, and the enzymes

were applied for some hours daily 20,000 units of streptokinase and 7000 units of streptodornase were applied each day, and the slough separated in 10–14 days The raw area was then ready for grafting, the graft was a 75% "take," compared to a 50% take on the raw area on the control side There have been no local or general toxic effects Collagen and fibroblasts are not in the spectrum of these enzymes

Collagenase—Dr ALTEMEIER has studied collagenases from three sources clostridia, gram negative bacilli, and vegetable compounds For slough removal the chief need is a collagenase, since 70% of skin sloughs is collagen The collagenase from clostridia (*Cl histolyticum*) and that from gram negative bacilli accelerates the separation of sloughs, but less so than the collagenase from the vegetable compound Application of this substance to experimental sloughs caused the sloughs to separate so rapidly that in 20 hours they could be wiped off, but there were severe reactions in the surrounding viable tissues The problem now is to find the proper dosage of this extract, and the means of protecting normal tissues when it is used

PLASTIC REPAIR OF SEVERE BURNS

Dr J BARRETT BROWN said that local technique is not as important as being kind, gentle, and clean in the treatment He showed a number of slides demonstrating the excellent results that follow early grafting with good technique Slides were also shown to illustrate the value of homografts as a temporary cover while the metabolic imbalance is corrected Dr Barrett Brown mentioned the risk of infection of dermatome donor sites, especially when the patient is in a state of metabolic imbalance He believes that saline baths have a valuable place in treatment of the healing phase of extensive deep burns

Dr SUMNER L KOCH showed slides illustrating the many and difficult problems in deep burns of the hand Sloughs were generally removed in the second week under a tourniquet, a free graft cover was then given even when tendon and bone were exposed In such deep burns the thin primary cover was later replaced by flaps of skin and fat under which the tendon nerve, and bone grafts might be done

DISASTER PROBLEMS OF BURN CARE

Dr TRUMAN G BLOCKER, jun pointed out that in mass disasters it is impossible to provide treatment by accepted standards, but preparation and planning are needed He drew attention to the multiplicity of lesions in most disaster casualties, to the multiplicity of sources of trauma, and to the serious adverse effects of ionising radiation on the course of burns and soft tissue injuries He believes that there is need for criteria by which the greatest proportion of patients can be saved As to local treatment, the average doctor still cannot apply pressure dressings safely and properly, he has seen many examples of peroneal and ulnar nerve palsy following application of such dressings to burnt limbs He believes that the best local treatment is by exposure With this treatment fewer patients need grafts, there are fewer complications, and there is earlier ambulation and better morale throughout He would recommend its use for A bomb burns caused by flash, affecting face or perineum, or one side (not the whole circumference) of a limb The need for training more surgeons in methods of management is urgent Finally he recommended five things in plans for these disasters (1) concentration of treatment on patients with a chance of useful survival, (2) standardisation of methods at a lower level than the peace time ideal, (3) the making of stock piles of essential medical equipment, (4) the issue of plans of treatment of early phases of burns to all physicians and (5) establishment of burns centres

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IMPLICATIONS OF THE REDUCTION

The immediate result of the reduction in registrar establishment will be that some 1200 doctors in England and Wales with at least five years' postgraduate training, and often more, will be without posts when their present contracts expire Their absorption into alternative posts will be a formidable problem It will be no less of a problem to find ways whereby their present hospital duties can be performed when they are gone

But this is not the whole story The new establishment allows of the appointment each year of some 550 registrars (1100 spread over two years) of whom 200 each year will become senior registrars (600 spread over three years) and 150 will eventually find posts each year as consultants This means that of the 550 hopefuls who each year achieve the rank of registrar (presumably after each has already done some two or three years' postgraduate hospital practice) 400 will not

grafting, of those with pressure dressings 27 needed grafting None of the exposed patients had fever for 1–6 weeks, 34 of the patients treated with dressings had such a fever, and 5 of this group had streptococcal rashes, which were entirely absent from the exposed group

Mr Wallace said that the exposure method is used by him as a means to an end—this end is to obtain a dry skin with maximal preservation of the skin's natural property of resistance to infection He believes that a dry skin could probably also be obtained by an absorptive dressing In his view the term "pressure dressing" is wrong, it should be replaced by the term "absorptive dressing" The two methods—exposure and absorptive dressings—are complementary rather than mutually exclusive There are indications for the use of each

INFECTION IN SEVERE BURNS

Mode of Infection and its Control—Dr LEONARD COLEBROOK, F R S, reviewed his very extensive experience while in charge of the M R C burns units in Glasgow and Birmingham The Glasgow burns were treated largely without antibiotics

"The bacterial factor is the biggest in severely burnt patients" 90% of severe burns are complicated by infection, which postpones grafting and healing and causes unnecessary disability and unnecessary deaths The tradition that in severe burns infection is inevitable is wrong, infection can be avoided Today many cases of 60–70% body surface burns recover Dr Colebrook reserved his judgment of the exposure method of treatment

In Birmingham the policy was to regard all burns as liable to infection and needing treatment under a microbe proof barrier This meant doing all dressings in a room with sterile air, and the use of topical penicillin Dr Colebrook showed slides demonstrating relatively simple air conditioning apparatus, whereby an effective rate of air replacement from above down at 20–30 replacements per hour ensures a virtually sterile environment within the dressing room The value of this sterile air has been difficult to assess, because a strict dressing technique and topical penicillin were used concomitantly But the over all effect of these three factors was most striking Thus, in Glasgow, without the dressing room, the infection rate with hæmolytic streptococci was 30%, at Birmingham it was less than 5% At Birmingham, too, many burns were kept completely sterile for 2–3 weeks The average stay in hospital has been reduced by 50% Clinically pain has been largely eliminated, and throughout treatment the morale of patients is good

Dr Colebrook made a special plea for the establishment of burns centres in all large cities About 100 beds per 1,000,000 population are necessary in England, in the U S A burns are about twice as common, and 200 beds per 1,000,000 are probably necessary He also drew attention to the possible conversion, for war purposes, of ambulances into mobile dressing rooms with sterile air produced by air conditioning at a high rate of air replacement Another urgent need is the determination of a simple dressing (to be left on for a week) for hand and face flash burns

Dr Colebrook declared that, in the event of mass casualties, streptococcal infection might again be seen in its old, dangerous, and epidemic form Our present relative freedom is due to penicillin, to small numbers, and to conditions of treatment which could not be expected to prevail with mass casualties

Antibiotic Therapy—Dr WILLIAM A ALTEMEIER said that the majority of U S doctors prefer systemic to topical penicillin Each antibiotic has a limited antibacterial spectrum Penicillin has the widest range, chloramphenicol the next widest, and then 'Aureomycin' and 'Terramycin' Terramycin is effective against the highest percentage of cocci and gram negative bacilli, this is to be expected since it has been used only for a short time Antibiotics are only a temporary measure in the control of infection in deep burns, these need surgical removal of the sloughs and a graft cover

NUTRITIONAL CARE

Burn Anæmia—Prof G WATSON JAMES outlined the biochemistry of the formation of hæmoglobin from a globin and from an iron containing hæm fragment On breakdown the iron is retained by the body, the pigment excreted The progenitor of the red cell is the site of the synthesis of hæm and globin into hæmoglobin The resources for this are brought to the cell by the plasma If the plasma protein (including glycine) is low there is normoblastic arrest Any disturbance of porphyrin metabolism probably indicates severe disorder of red cell metabolism He drew attention to the large amount of red cell mass that disappears after the dressing of extensive burns In burn anæmia the hæmoglobin tends to settle at about 8–10 g per 100 ml He concluded that the anæmia requires, for its radical treatment, the removal of dead tissue and healing by grafts

Nutritional Care—Dr STANLEY M LEVENSON spoke of the adverse effect on nutrition of combined radiation and thermal damage Routes of feeding are by mouth, stomach, jejunum, or vein Optimal amounts have not yet been determined, but high intake in the first week is always beneficial The most useful diets are liquid, given as regular small feeds, with a calorie content of 3500–5000 and protein totalling 100–250 g (When milk is the major protein source, there may be danger of calculi) A thin plastic nasal tube may be left for up to 5 months, with weekly removal for cleaning, this permits administration of protein in the form of unpalatable liver feeds 20% of calories should be from fat

Dr FREDERICK J STARE declared "I do not know what an adequate calorific intake for a severe burn is" A fine emulsion of coconut oil, in addition to providing calories, confers efficiency of utilisation on other elements in the diet The average particle is $^1/_2$ μ, none is larger than 3 μ With oral administration all the fat is absorbed, none is recovered in the fæces The emulsion is palatable and can be used as a solvent for vitamin K (When so combined and given intravenously, it can correct the effects of dicoumarol in 12–24 hours) The emulsion is out of the blood stream in $3^1/_2$ hours When tagged with radioactive C^{14} the carbon can be detected in expired air within 2 minutes of being injected 1 litre, carrying 3200 calories, can be given in half an hour, up to 5–6 g of fat per kg body weight per day is given A glassful of the fat emulsion taken orally gives 1500 calories

EARLY DEBRIDEMENT OF BURN WOUNDS

Pyruvic Acid—Dr SAMUEL C HARVEY stated that pyruvic acid acts on the slough not digestively but rather as a physiological accelerator of the normal process of autolysis and separation

Streptokinase and Streptodornase—Dr WILLIAM S TILLETT said that the effects of these enzymes are proportional to the amount of substrate against which they are active Streptokinase is active against fibrin and globin, streptodornase against nucleotides, which form most of the solid component of pus Both need serum for activity, this is absent in dry sloughs Both cause proteolysis and liquefaction They are not effective against collagen The extensive slough of a burnt leg was "cross hatched" by incision, and the enzymes

were applied for some hours daily 20,000 units of streptokinase and 7000 units of streptodornase were applied each day, and the slough separated in 10–14 days The raw area was then ready for grafting, the graft was a 75% "take," compared to a 50% take on the raw area on the control side There have been no local or general toxic effects Collagen and fibroblasts are not in the spectrum of these enzymes

Collagenase—Dr ALTEMEIER has studied collagenases from three sources clostridia, gram negative bacilli, and vegetable compounds For slough removal the chief need is a collagenase, since 70% of skin sloughs is collagen The collagenase from clostridia (*Cl histolyticum*) and that from gram negative bacilli accelerates the separation of sloughs, but less so than the collagenase from the vegetable compound Application of this substance to experimental sloughs caused the sloughs to separate so rapidly that in 20 hours they could be wiped off, but there were severe reactions in the surrounding viable tissues The problem now is to find the proper dosage of this extract, and the means of protecting normal tissues when it is used.

PLASTIC REPAIR OF SEVERE BURNS

Dr J BARRETT BROWN said that local technique is not as important as being kind, gentle, and clean in the treatment He showed a number of slides demonstrating the excellent results that follow early grafting with good technique Slides were also shown to illustrate the value of homografts as a temporary cover while the metabolic imbalance is corrected Dr Barrett Brown mentioned the risk of infection of dermatome donor sites, especially when the patient is in a state of metabolic imbalance He believes that saline baths have a valuable place in treatment of the healing phase of extensive deep burns

Dr SUMNER L KOCH showed slides illustrating the many and difficult problems in deep burns of the hand Sloughs were generally removed in the second week under a tourniquet, a free graft cover was then given even when tendon and bone were exposed In such deep burns the thin primary cover was later replaced by flaps of skin and fat under which the tendon nerve, and bone grafts might be done

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become consultants, and each year 400 will be seeking alternative employment

Seen in this light, the present suggestion of directing some of the displaced registrars to specialist service in the Forces or in the Colonial Medical Service clearly provides no answer to the long term problem Where, then, can these men go? Can they be satisfactorily absorbed into general practice? It is quite plain that under present conditions they cannot The suggestion fails at once on the score of numbers alone There are between 18,000 and 19,000 doctors in general practice in England and Wales (about 17,000 principals and perhaps 1700 assistants) Few of them wish, or are able, to retire early The numbers of new practitioners needed to replace those who do retire or who die is unlikely to exceed 500 a year, and the displaced registrars will not be the only candidates for these 500 places They will have as rivals all those of their colleagues who have never aspired to registrar status, or who have decided as soon as their first postgraduate year was over that general practice was their métier and that the sooner they entered it the better And as things are now it will often be the younger man with fewer commitments and greater readiness and opportunity to serve an apprenticeship as an assistant that will be more easily placed in practice

Could not this annual figure of 500 places be stepped up perhaps with benefit to the under doctored areas? It might be were it not for two difficulties first, that of finding suitable premises from which the doctor could practise, and secondly, that of paying for his services The first difficulty will remain as long as housing shortages persist and health centre construction is deferred, the second as long as the present methods of computing and distributing the practitioners' pool remain unaltered This central fund does not vary in size with the number of practitioners in the service Every extra doctor joining the medical list makes one more to share a total financial allocation which no practitioner regards as adequate even for the present number So if general practice is to be the destination of an appreciable proportion of the displaced registrars, new money will have to be found to pay them

With the present completely separate organisation of hospital and general medical services, and with the tendency, too, for the hospital authorities to exclude the general practitioner from any but a most attenuated participation in the work of the hospitals, the ex registrar would have difficulty today in finding a place in general practice where he would feel able to use to advantage the special knowledge and experience gained in his costly postgraduate years

Does this, then, make nonsense of one of the Minister's suggestions for meeting the staffing difficulty in which regional boards may find themselves through the withdrawal of the registrars' services—namely, that

> boards may appoint a suitably experienced general practitioner (normally one with a higher qualification and experience as a senior registrar or registrar) on a part time basis to act as a clinical assistant This is intended as a long term method of meeting staffing difficulties in the senior registrar field, and has the advantage of providing a valuable link between the general practitioner and the hospital services In making appointments of this kind it will be necessary for boards to satisfy themselves not only that the practitioner has the experience and qualifications required, but also that his commitments in general practice will not prevent his devoting the time needed to carry out the duties of the hospital post '

It does, if all is left to a vague policy of laissez faire, for the registrar will then be hard pressed to find a place anywhere in general practice, let alone somewhere where a hospital appointment suitable to his special training is also available But given a coördinated policy between the regional hospital boards, the executive councils, and the local medical committees, the Ministry's proposal could provide a method of entry into practice which would at the same time be to the advantage of the registrars, the hospitals, and general practice

PLAN FOR COÖRDINATION

The initiative in this matter must lie with the regional boards Theirs is the chief problem—that of ensuring that the work of the hospitals continues when the registrars are gone Theirs, too, is the chief moral responsibility for seeing that all that can be done is done to help the men who have in their years of training helped the hospitals so much

With the reduced establishment of registrars it will obviously now be necessary for the regional boards and boards of governors to re examine every present post and determine whether it shall still remain a registrar appointment Many of the posts which give less favourable opportunities for teaching or for gaining specialist experience will no longer be classified as registrar appointments Where this is so, and the duties of the post cannot be absorbed satisfactorily by the remaining establishment, the regional boards should consider whether they could obtain the extra help they need by creating one or more part time clinical assistantships If so, they should consult with the local medical committee, which alone knows of the potentialities of general practice in the area and the extent to which the commitments of the local practitioners allow of their participating in hospital work Possibly among the practitioners already established there may be one suitable to take on the required duties More probably it will be necessary to advertise the post with a view to finding someone of registrar status to fill it In this case the regional board should decide the number of weekly sessions it is prepared to offer, and should state the remuneration this work will carry The local medical committee will be able to advise on the opportunities the doctor appointed will have of supplementing his hospital work by general practice, and the limit that should be put to his general practitioner work bearing in mind his hospital commitments

Quite apart from the definite attraction of association with the local hospital, the fact that even at the start the doctor would not be a total liability to any practice he joined, but would carry with him an income in his own right, should make it easier for him to find a place as partner or assistant in an established practice More over, nowadays quite a number of small practices are falling vacant in which the numbers are too small to justify the appointment of a successor, and these practices are dispersed Such a practice could often be quite satisfactorily taken over by a man with a part time hospital appointment, as a nucleus on which he could build Then again there are areas where local conditions (as in a growing town) would make it possible for a doctor, even when starting on his own, to build within a reasonable time a large enough practice to provide, with his hospital salary, a passable income

Nevertheless some of the practitioners appointed will need to be subsidised beyond their hospital stipend while waiting for opportunities to enter practice, or for their practice to grow If such subsidy is necessary, it must come from the regional board, for this is not a charge that the practitioners' present fund could reasonably be expected to bear

NEED FOR A NEW APPROACH

Admittedly this is a revolutionary approach to entry into practice, but the situation facing the registrars is one in which no orthodox approach offers hope of relief The essence of the scheme is that the onus of making the posts and of finding the money to pay for

them is placed on the regional hospital boards More men will be placed in practice, but the total pool for practitioner remuneration will be augmented by money coming from hospital sources Much, if not all, of this new money will come from sums originally set aside for paying registrars

Among the matters that remain to be decided are terms of service and the amount of remuneration, the place the practitioner should occupy in the hospital hierarchy (would it be that advanced in the Oxford plan for the "area department team"?), the types of specialty that could be covered (some help might be obtained from the recent circular on S H M O posts), whether the appointment should be permanent from the start or only after experience has proved the practitioner's suitability for his dual role, and whether, at the practitioner's request, the type and extent of his hospital duties could be varied, the better to fit with his increasing commitments in practice

These details can no doubt be settled at the proper time At present it is important only to know whether the principle underlying this scheme is acceptable If it is, and if it is thought worth a trial, the regional boards will need to act throughout in concert with the local medical committees and the executive councils There are still few places in the country where machinery for close liaison between these bodies exists For combined action such machinery should be set up without delay, for there is much to be done, and the sands, like the registrars' contracts are fast running out

FELLOWSHIP FOR FREEDOM IN MEDICINE

ADDRESSING the annual general meeting of the Fellowship on Nov 18, Lord HORDER said that the tasks it has set itself were (1) to restore the morale of the profession, (2) to protect and encourage private practice, (3) to disillusion the public about the National Health Service in the face of political propaganda (4) to call attention to its inherent defects, and to examples of maladministration and extravagance, (5) to advise practical remedies for the deficiencies of the Act, and (6) in particular, to permeate the British Medical Association with the ideals of the Fellowship In every one of these respects, it had made progress the morale of the profession had risen, the press and public were becoming critical of the service, and even of its underlying principles, and instances of extravagance and maladministration were brought to light every day Lord Horder then defined the policy of the Fellowship on a number of other questions It supported the claim of the B M A for a just settlement of the betterment factor and it supported the British Medical Guild as an instrument which would enable the profession to withdraw from the service if necessary It sympathised with the efforts of general practitioners to preserve their hospital facilities, and it was agin" the closed shop He likened the dream of the Welfare State to a phantasmagoria—"a series of optical illusions arranged for public display"—and said that the present situation would not improve until we awoke from this dream He was not worried about membership—every cause had a ceiling, and perhaps 3000 was the Fellowship's ceiling In any case, it had become the focal point of resistance to deteriorating standards, loss of freedoms, and personal frustration its influence would inevitably increase

Before the Chairman's address, Dr A C E BREACH defined the ways in which the Act should be amended The powers of the Minister should be reduced, he said, there should be an independent court of arbitration to which either party could refer a dispute, and the penalising clauses of the Act ("an amateur attempt to short-cut the law") should be abolished Hospitals should receive block grants to spend at their discretion, medical staff committees should enjoy a statutory right to submit advice, and the Minister should set up a central appeal mechanism for grading Dr Breach then turned to private practice and suggested that doctors should be able to regain the ownership of the goodwill of their practices There should be free drugs for private patients, grants in-aid for those who chose private beds, and facilities for anyone to "contract out" of the service and receive compensation from the State He anticipated that the Government would require a guarantee that those who "contracted out" would not, at some future date, become a burden on the State, and he was therefore looking for an insurance company which would provide cover against all forms of sickness at a fixed premium, without a medical examination. He went on to say that the fellowship sought to promote its ideas by "introducing its leaven into the mass of the B M A." its members were already playing a prominent part in B M A. activities and committees

Dr G J V CROSBIE, another member of the executive, said that the general practitioners were losing touch with hospital medical officers Practitioners should not only be provided with the full range of diagnostic facilities but should also be admitted to hospital practice He then introduced Dr T W MORGAN, of Kingston, who was loudly cheered when he described the action taken by him and his colleagues to retain the use of the Kingston Victoria Hospital, the meeting adopted a resolution in support of this hospital and of any others in a like situation

Dr A D KELLY, assistant secretary of the Canadian Medical Association, was asked to describe the insurance scheme which some divisions were offering the public as an alternative to commercial insurance or a State service These schemes he said, covered 500,000 persons against all forms of sickness without any medical examination Doctors received a proportion of the pool corresponding to the premiums paid into it by their patients In his opinion, it was preferable to try and modify government policy before it had been translated into law

Medicine and the Law

A Question of Diagnosis

As there seems sometimes to be an impression that medical practitioners guarantee infallibility, the judgments of the House of Lords in Whiteford v Hunter, though they may induce a natural sympathy for the unsuccessful appellant, are professionally reassuring

The facts of the case, which have already been recorded,[1] are briefly as follows Mr Whiteford, an American engineer, consulted a London surgeon, Mr J B Hunter, in March and April, 1942 He alleged that his condition was then diagnosed as a cancerous growth in the bladder and that he was warned not to expect to live much longer the growth being so far developed that nothing could be done for him Thereupon Mr Whiteford closed down his practice, gave up all his concerns in England, and went home to America to die On his taking further advice in New York Dr Benjamin Barringer, emeritus urologist at the Memorial Hospital in that city, established the absence of cancer, found the patient to be suffering from chronic cystitis and a considerable bladder diverticulum, and cured him Mr Whiteford, suing Mr Hunter for damages for negligence was awarded £6300 damages by Mr Justice (now Lord Justice) Birkett the Court of Appeal allowed Mr Hunter's appeal and on Nov 16 the House of Lords upheld the Court of Appeal

Mr Whiteford's case was founded not so much upon negligent diagnosis as upon the criticism that, there being a close resemblance between real and simulated cancer, a diagnosis of cancer should not be accepted without a pathological examination A plaintiff who claims damages for negligence must give particulars of the negligence which he alleges The two specific allegations which influenced the court of first instance were, according to Lord Porter's opinion in the House of Lords (1) the

1 *Lancet* 1948 ii 232 *Ibid* 1949 i 536

omission to use a cytoscope before opening the bladder, and (2) the omission to take a specimen of the growth in order to make a microscopical test of the presence or absence of cancer Dr Barringer, giving evidence on commission for the plaintiff, stated that there was no difficulty or danger in either of these operations

Lord Porter observed that all the medical witnesses in this country asserted that it was contrary to approved practice to use a cytoscope in cases of acute urinary retention, when the bladder was drained and collapsed, they said, it was difficult, if not impossible, to use a cytoscope effectively unless it was an instrument of the flushing type Mr Hunter did not possess such an instrument, it was rare in this country at the material date As regards the growth, Mr Hunter had spoken of "an indurated mass covered with thickened mucous membrane abnormal in colour" Apparently Dr Barringer, examining Mr Whiteford in August, 1942, did not have in mind the condition found by Mr Hunter in the previous April, when the bladder was opened The circumstances in which Dr Barringer opened the bladder were very different from those subsisting when Mr Hunter made his diagnosis Even if Dr Barringer's evidence were accepted in full, said Lord Porter, no specimen could have been taken unless the cytoscope was fitted with a rongeur attachment, witnesses had proved that such an instrument was in 1942 rare in England and was not then possessed by Mr Hunter The two specific allegations of negligence having thus been dealt with, Lord Porter reaffirmed the general statement of the law which Lord Justice (now Lord) Maugham made in 1935 in Marshall v Lindsey County Council "A defendant charged with negligence can clear himself if he shows that he has acted in accord with general and approved practice" Mr Hunter gave evidence in the trial court that his action did so conform, and two eminent surgeons had testified in support of his statement

Mr Hunter's vindication is a satisfying success for the legal experts whom a medical defence society can bring to the help of a defendant practitioner In this litigation there was, through no fault of theirs, an adverse finding of fact in the court of first instance To controvert and displace an adverse finding of fact, as Mr Hunter's counsel managed to do in the Court of Appeal, is a task of known difficulty The Medical Defence Union can be congratulated on the result

Disabilities

53 MINER'S NYSTAGMUS

ON leaving school in April, 1914, my real desire was to be a farmer, I have always loved the country and still do I suppose it would be because I thought I would make a little more money, and that my father and grandfather had been miners, that I went to the colliery It was in the August of that year (the critical month in the history of this country), after working on the pit head for a few weeks, that I went to the lamp cabin, armed with a note signed by the colliery manager, and demanded a lamp While I was thrilled at the adventure of descending the mine, still it was not my desire—the open field would have suited me much better

I am not a tall man by any means, but at that time I was small—so small that, as I walked along the tub way, I had to keep lifting my oil lamp up to prevent it from knocking against the rails and going out (The tubs—small wagons holding 8 cwt of coal—run along this little two foot gauge railway) After learning to harness and yoke a pony, I was taught to ride the limbers—iron shafts ending in a hook to fix on to the tub—and thus became a driver Time went on, and at 18 I became a putter, taking tubs to and from the hewer, a much more strenuous job, for which I was paid by the score of tubs put This meant, besides lots of other things, competition with other putters

In 1926 there was a spell on the dole for a month or so, my colliery having closed down, and after that I became a hewer with a hand pick This again was piece work and meant competition with other men One must get as much as the next man, unless there is a vast amount of difference in the nature of the coal, no matter what advantage he may have in size and strength Looking back, I can see that it was the constant strain of working in a poor light, and striving to produce the same as other men in my district, that began the trouble with my eyes I don't recall any pain then, but I remember that after only a year of face work, I often had to put my hand out and touch a prop to steady myself while walking in by to the place where I was working By this time I was married with a small family, which added to my responsibilities The struggle through the 1926 strike, and extremely hard times after, had all meant nervous strain, and as the years went on my eyes became gradually worse Many times I thought of going to the doctor about them, but the prospect of a small compensation or sick pay was not encouraging, so for over twenty years I went on as I was

At home, and in any public buildings I had (and still have) to shield my eyes from the light, and in the pit the torture of a light in front got more acute Later still I began to have a sensation of dizziness when stooping, sometimes even when looking down at my plate while sitting at the table What made me go to the doctor eventually—in April, 1949—were the severe pains I began to get in the back of my head Even while I was in bed these pains were frightening, and besides I began to stumble when rising to my feet

My doctor wrote a note to an eye infirmary, but it was not until November that I was sent for to be examined I came back with a letter from the surgeon, and after this my doctor's certificate (I was off work at this time with my eyes) said that I had nystagmus At once the National Insurance authorities sent me to their doctor, who disagreed about my case, so I couldn't claim industrial disease benefit About three weeks later I was sent by the insurance authorities to a specialist, and he also was not satisfied It seems that, though I had many of the symptoms of the disease, they couldn't at that moment find any oscillation Eventually, after a few weeks, I was sent to a lady doctor, who evidently decided I had nystagmus, for the following week I received a little over £8 from the National Insurance—the difference between sick pay and industrial disease benefit for the few weeks I was off at the end of last year

After I had been off five weeks I asked my own doctor if I could go back down the mine He was surprised, but said I could try, and I have been at my old job at the coal face ever since I have still got the trouble, as bad as ever, but I have learnt that resting when I can helps me to manage my work Nothing else eases my head pains, and if I couldn't rest for a day or two now and again I should have to leave my work altogether

A few weeks ago I received a kind invitation from a medical college to be examined for the cause of nystagmus research It was rather strange to have an electric cap put on my head, and someone in the next room studying so it seems, the inside of my head And on my second visit the questions I was asked were innumerable—two hours of questioning But I didn't mind because I was resting my eyes, and my full pay was assured Then I was invited to attend an eye infirmary, and answered more questions, this time my wife was asked too, and she answered questions on our home life In all this I was really treated like a gentleman and not just one of a mob

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Turning to the example in his own constituency of Bexley, Mr Heath related how Dr Green[1] who had surgeries in both Bexley Heath and Erith, had over 5000 patients As Dr Green refused to take an assistant or partner, or to name the patients to be taken off his list, the executive council had drawn an ellipse round the area which included both the surgery and branch surgery of Dr Green so that it would take in the maximum of 4000 patients. A notice had been sent to every patient living outside that area informing them that within seven days they would be struck off Dr Green's list and must find another doctor among those on the Post Office list for the borough Mr Heath did not object to the reduction of the list, but to the way it had been done The general turnover of a doctor's list, he understood, was between 300 and 600 Why Mr Heath asked, could not the list be closed and allowed to reduce itself to about 4200 in about eighteen months? He objected strongly to the geographical method instead patients who had joined the list last should be the first to go Seven days' notice, he declared, was callous Patients who wished to change their doctor had to give three weeks notice Again was it too much to ask that the executive council on striking a person off a doctor's list should provide him with a list of the doctors whose lists were not yet full?

Mr ARTHUR BLENKINSOP, parliamentary secretary to the Ministry of Health did not think that the wording of the circular sent out in the Bexley and Dartford area was the best that could have been designed It had always been the intention that a certain maximum number of patients on a doctor's list should be insisted upon in order to secure a proper service No vacancies for new doctors desirous of entering the service could be provided unless some reasonable maximum figure on the individual list was fixed Some members of the medical profession argued that 4000 was far too high He appreciated that the reduction of lists caused hardship and a certain amount of ill-feeling among the patients concerned. The reason why lists were allowed to grow in the initial stages of the service was to be certain that families already on the lists were not ruled out If Dr Green had tried to help the executive council, as most doctors had tried to do, in carrying out this general decision on limitation, a great deal of the difficulty which had arisen could have been avoided Not having the assistance of the doctor the executive council took what Mr Blenkinsop regarded as on the whole a reasonable decision to try to rule out those patients who appeared to them to be farthest away from the doctor's main centre of practice Any patients actually in receipt of treatment at the time would not be withdrawn from the list, and a patient excluded from a doctor's list could still get emergency treatment should the need arise before he managed to select another doctor But Mr Blenkinsop agreed that it was a point whether or not seven days was sufficient notice. He also thought that executive councils should give patients a list of other doctors in the area rather than merely refer them to the Post Office list After examining the case as a whole Mr Blenkinsop did not feel that the strictures on the executive council were really justified

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> The Minister wishes to make it clear to all local authorities that he considers that their primary duty as health authorities is to maintain the efficient and smooth running of their health services and to ensure the welfare of the patients for whom they are responsible All other considerations must in his view, be regarded as secondary and he trusts that local authorities will follow this principle in their administration While the Minister is anxious that doctors nurses and members of similar professions should join a trade union or appropriate professional association, he considers that this matter should not be determined by the unilateral action of local authorities

Dr Hill asked the Minister to repeat this advice

Dr H B MORGAN thought it reasonable to require an individual to join an organisation which might be a party in negotiations on conditions of employment The Durham County Council were not telling the doctors that they must belong to the B M A. or the M P U, but they wanted to know that they were members of some representative organisation which could speak jointly for them and for other employees Dr HILL interposed that negotiating machinery for the most part existed in the Whitley structure

Mr BLENKINSOP said that the part of the 1946 circular which had been read to the House still represented the view of the Ministry of Health and indeed of the Government They regretted the resolution passed by the Durham County Council At the same time they were anxious that local authority and other employees in regular employment should join their respective trade union or professional body They would certainly take the measures open to them—they were merely advisory—and draw the county council's attention to the circular issued in 1946, and the reply given in 1948 by the Minister of Health to a question in the House of Commons when he said

> I hope that persons employed in the National Health Service will be encouraged to belong to their appropriate organisations but it will not be a condition of employment and there will be no pressure upon anyone to belong to any organisation whether professional or trade union.'

The Doctor's House

In the House of Commons on Nov 16, Miss P M HORNSBY-SMITH called attention to the method of appointing doctors to the new London County Council estate, area of over 3000 houses known as St Paul's Cray A large population was being transferred to the estate which gave scope for doctors to build up a practice One would have expected these openings to be advertised, and that from the applications the Medical Practices Committee would select doctors to practise on the estate During the past four months she had received protests against the active Communist activities of two of the four doctors appointed to a practice on this estate She had therefore investigated the method of

omission to use a cytoscope before opening the bladder, and (2) the omission to take a specimen of the growth in order to make a microscopical test of the presence or absence of cancer Dr Barringer, giving evidence on commission for the plaintiff, stated that there was no difficulty or danger in either of these operations

Lord Porter observed that all the medical witnesses in this country asserted that it was contrary to approved practice to use a cytoscope in cases of acute urinary retention, when the bladder was drained and collapsed, they said, it was difficult, if not impossible, to use a cytoscope effectively unless it was an instrument of the flushing type Mr Hunter did not possess such an instrument, it was rare in this country at the material date As regards the growth, Mr Hunter had spoken of "an indurated mass covered with thickened mucous membrane abnormal in colour" Apparently Dr Barringer, examining Mr Whiteford in August, 1942, did not have in mind the condition found by Mr Hunter in the previous April, when the bladder was opened The circumstances in which Dr Barringer opened the bladder were very different from those subsisting when Mr Hunter made his diagnosis Even if Dr Barringer's evidence were accepted in full, said Lord Porter, no specimen could have been taken unless the cytoscope was fitted with a rongeur attachment, witnesses had proved that such an instrument was in 1942 rare in England and was not then possessed by Mr Hunter The two specific allegations of negligence having thus been dealt with, Lord Porter reaffirmed the general statement of the law which Lord Justice (now Lord) Maugham made in 1935 in Marshall v Lindsey County Council "A defendant charged with negligence can clear himself if he shows that he has acted in accord with general and approved practice" Mr Hunter gave evidence in the trial court that his action did so conform, and two eminent surgeons had testified in support of his statement

Mr Hunter's vindication is a satisfying success for the legal experts whom a medical defence society can bring to the help of a defendant practitioner In this litigation there was, through no fault of theirs, an adverse finding of fact in the court of first instance To controvert and displace an adverse finding of fact, as Mr Hunter's counsel managed to do in the Court of Appeal, is a task of known difficulty The Medical Defence Union can be congratulated on the result

Disabilities

53 MINER'S NYSTAGMUS

ON leaving school in April, 1914, my real desire was to be a farmer, I have always loved the country and still do I suppose it would be because I thought I would make a little more money, and that my father and grandfather had been miners, that I went to the colliery It was in the August of that year (the critical month in the history of this country), after working on the pit head for a few weeks, that I went to the lamp cabin, armed with a note signed by the colliery manager, and demanded a lamp While I was thrilled at the adventure of descending the mine, still it was not my desire—the open field would have suited me much better

I am not a tall man by any means, but at that time I was small—so small that, as I walked along the tub way, I had to keep lifting my oil lamp up to prevent it from knocking against the rails and going out (The tubs—small wagons holding 8 cwt of coal—run along this little two foot gauge railway) After learning to harness and yoke a pony, I was taught to ride the limbers—iron shafts ending in a hook to fix on to the tub—and thus became a driver Time went on, and at 18 I became a putter, taking tubs to and from the hewer, a much more strenuous job, for which I was paid by the score of tubs put This meant, besides lots of other things, competition with other putters

In 1926 there was a spell on the dole for a month or so, my colliery having closed down, and after that I became a hewer with a hand pick This again was piece work and meant competition with other men One must get as much as the next man, unless there is a vast amount of difference in the nature of the coal, no matter what advantage he may have in size and strength Looking back, I can see that it was the constant strain of working in a poor light, and striving to produce the same as other men in my district, that began the trouble with my eyes I don't recall any pain then, but I remember that after only a year of face work, I often had to put my hand out and touch a prop to steady myself while walking in by to the place where I was working By this time I was married with a small family, which added to my responsibilities The struggle through the 1926 strike, and extremely hard times after, had all meant nervous strain, and as the years went on my eyes became gradually worse Many times I thought of going to the doctor about them, but the prospect of a small compensation or sick pay was not encouraging, so for over twenty years I went on as I was

At home, and in any public buildings I had (and still have) to shield my eyes from the light, and in the pit the torture of a light in front got more acute Later still I began to have a sensation of dizziness when stooping, sometimes even when looking down at my plate while sitting at the table What made me go to the doctor eventually—in April, 1949—were the severe pains I began to get in the back of my head Even while I was in bed these pains were frightening, and besides I began to stumble when rising to my feet

My doctor wrote a note to an eye infirmary, but it was not until November that I was sent for to be examined I came back with a letter from the surgeon, and after this my doctor's certificate (I was off work at this time with my eyes) said that I had nystagmus At once the National Insurance authorities sent me to their doctor, who disagreed about my case, so I couldn't claim industrial disease benefit About three weeks later I was sent by the insurance authorities to a specialist, and he also was not satisfied It seems that, though I had many of the symptoms of the disease, they couldn't at that moment find any oscillation Eventually, after a few weeks, I was sent to a lady doctor, who evidently decided I had nystagmus, for the following week I received a little over £8 from the National Insurance—the difference between sick pay and industrial disease benefit for the few weeks I was off at the end of last year

After I had been off five weeks I asked my own doctor if I could go back down the mine He was surprised, but said I could try, and I have been at my old job at the coal face ever since I have still got the trouble, as bad as ever, but I have learnt that resting when I can helps me to manage my work Nothing else eases my head pains, and if I couldn't rest for a day or two now and again I should have to leave my work altogether

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Mr BLENKINSOP said that the part of the 1946 circular which had been read to the House still represented the view of the Ministry of Health and indeed of the Government They regretted the resolution passed by the Durham County Council At the same time they were anxious that local authority and other employees in regular employment should join their respective trade union or professional body They would certainly take the measures open to them—they were merely advisory—and draw the county council's attention to the circular issued in 1946, and the reply given in 1948 by the Minister of Health to a question in the House of Commons when he said

> "I hope that persons employed in the National Health Service will be encouraged to belong to their appropriate organisations but it will not be a condition of employment, and there will be no pressure upon anyone to belong to any organisation whether professional or trade union."

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their appointment and found that Dr J D Paulett was granted by the L C C a house compulsorily acquired from a private owner Having got those premises he applied to the Medical Practices Committee saying that he had been granted the doctor's house on the estate and asked for permission to practise At that time other doctors had submitted their names to the L C C as wishing to practise, but only the name of Dr Paulett appeared to have gone forward, and as there was only one applicant in the field the Medical Practices Committee had no option but to appoint him One of the three other doctors who were later appointed also applied to the committee for permission to practise, saying he had premises and facilities given him by the L C C Miss Hornsby-Smith urged that the position of the M P C was prejudiced when they had only one name submitted to them and when that applicant claimed that he had the premises and that virtually he was allowed to start up in practice The L C C by deciding which doctors should be allocated a house from which to practise were in fact choosing the doctors on this estate and usurping the statutory right of choice of the M P C She asked that applications by doctors wishing to practise in these areas should be submitted to the M P C who could then say to the local authority "we choose doctors A, B, and C, and we look to you to provide accommodation for them" Mr PERCY DAVIES Is the hon Lady saying that these doctors were chosen because they were Communists? Miss HORNSBY SMITH replied that she thought the selection of names to go forward to the Medical Practices Committee showed signs of definite political prejudice

Mr ARTHUR BLENKINSOP bitterly resented the manner in which the subject had been raised, especially the implicit suggestion that the political views of doctors should be taken into account on their appointment The whole medical profession desired to have freedom for doctors to set up practice On the broader issue raised, he continued, any doctor might apply to practise in an area, and could only be refused if the area was overdoctored Vacancies were advertised only when a sitting doctor withdrew or where the area was underdoctored

Dr CHARLES HILL thought this was an instance of a general difficulty underlying the machinery of the Medical Practices Committee If a vacancy arose through the death or retirement of a doctor and it was decided to fill the vacancy, and the full procedure of advertisement and selection had been followed, then if a doctor—whether he was an applicant or not—had obtained by purchase or otherwise premises from which the practice was conducted, or the only appropriate professional premises in the area, it was difficult to make an effective choice of any other person. That was the difficulty which the Medical Practices Committee, with the coöperation of the medical profession, were trying to tackle Whatever other issues might be involved in this case, there was, he urged, a general problem It would be a pity, he thought, if the new National Health Service machinery were short-circuited by a local authority who named a doctor as tenant He thought there was good reason for the L C C to follow another method to ask the official machinery to advertise the vacancy and to allot the house to the selected doctor One general method should be adopted, approved by the Ministry of Health and under the supervision of the M P C, to avoid this instance of tenancy being the best part of the law

Mr BLENKINSOP said he appreciated the points which Dr Hill had raised and the Ministry would be prepared to look into the question What he resented so deeply was the implication that this was tied up with some preferential treatment for alleged Communists There was certainly a problem in relation to doctors' premises, and he could give an assurance that the point would be considered in relation to the discussions which the Ministry were already having with the British Medical Association

*** *See also p 655*

Penicillin (Merchant Ships) Bill

On Nov 14, Lord SHEPHERD moved the first reading of this Bill Its purpose is to amend the Penicillin Act so that penicillin can be used for the treatment of persons on board merchant ships which do not carry a doctor Cases have occurred where members of the crew of a merchant ship suffering from an infected wound, for example, have not been able to have treatment with penicillin if there was no doctor on board It is now felt that the experience gained in the use of penicillin makes it possible to define when it can and cannot safely be used If the Bill is approved, advice on these lines will be included in the *Ship Captain's Medical Guide* which is carried on merchant ships in accordance with the Merchant Shipping Act, 1894

QUESTION TIME

Incidence of Tuberculosis

Replying to a question Mr A BEVAN said that 52,041 cases of tuberculosis were notified in England and Wales in 1949 He thought that figure showed an increase These increases were due to the fact that mass radiography was now being used Although more cases of respiratory tuberculosis were being discovered—the increase in notifications being 5½%—there had been a decrease in deaths over the last five years of 12½%

In answer to further questions he said that patients with early tuberculosis discovered by mass radiology tests were referred to a chest physician and treated according to their need and the facilities available There was some delay in the provision of treatment, but fortunately the treatment which was being given was reducing the number of deaths The general over all position was certainly improving He agreed that the real problem was the shortage of nurses That was the reason why he had circularised hospital authorities asking them to make beds available for this type of case in general hospitals He had had an interim report, and there had already been a very large increase in the number of beds available Annual returns as at Dec 31 last showed that the number of patients waiting for accommodation in tuberculosis hospitals and sanatoria was then approximately 11 000 He had been prepared to consider making use of the large number of beds available in Switzerland, but currency difficulties were involved He would be able to give the House before long a report on the progress made in providing hospital beds for tuberculosis treatment in this country

Increased Cost of Private Hospital Wards

In answer to a question Mr BEVAN stated that the increases for private ward treatment in the Merseyside hospitals, where the costs had increased by 100% from July, 1948, up to September, 1950, were partly due to increased costs and partly to the fact that the charge now covered the full cost in all cases

Mr H D OAKSHOTT As the use of private wards must relieve the pressure on public wards, will the Minister consider reducing the charges for private wards? Mr BEVAN That would really mean that a larger number of people would be able to pay for beds at the expense of others

Replying to Mr G H OLIVER, Mr BEVAN said if he was supplied with particulars of cases where admission to hospital was medically urgent and had been refused he would be glad to make inquiries Mr OLIVER Is the Minister aware that I have sent him particulars of a case where the patient after waiting for 11 months to enter a hospital was able to obtain admission as a private patient in less than 11 days?—Mr BEVAN If the patient was not suffering from anything requiring urgent medical treatment no problem arises, but he had no right to go into hospital ahead of people in greater medical need Mr OLIVER But if the patient was not suffering from something requiring urgent medical attention why could he enter the hospital as a paying patient in under 11 days?—Mr BEVAN I quite agree about that and I will investigate the matter if particulars are sent to me I am far from satisfied with the way in which it is possible for doctors to get their private patients into hospitals

Cost of N H S Prescriptions

Mr R H TURTON asked the Minister whether, in view of the evidence received from the Joint Pricing Committee for England that the average cost of prescriptions per person from Jan 1 to Sept 30 1949 was 11*s* 4½*d* he was prepared to review the present dispensing capitation fee of 6*s* 6*d*

paid to doctors who supplied medicines to patients on their National Health Service lists —Mr BEVAN replied No, Sir The figure quoted and the fee are not comparable In addition to the fee pro rata payment is made to the doctors for certain individual items supplied

Part-time Nurses

In answer to a question Mr BEVAN stated that the number of part time nurses had never been higher than the present total of 25,000 It was about 17 000 when the National Health Service began

Imports of Aureomycin

In answer to a question Mr BEVAN stated that 140,075 grammes of Aureomycin,' apart from small quantities for sample and trial purposes, had been imported from the United States of America during the nine months ended Sept 30, 1950

Food Allowances for the Tuberculous

In answer to Miss M P HORNSBY SMITH, who asked why the priority ration of an extra ounce of cooking fat and bacon was no longer included in priority food rations granted to sufferers from tuberculosis, Mr MAURICE WEBB said in view of the present levels of the bacon and cooking fat rations his medical advisers were satisfied that there was no need to continue these extra rations

Reciprocal Insurance Benefits

Sir WILLIAM DARLING asked the Minister of National Insurance what countries had accepted reciprocal insurance arrangements with the United Kingdom and if she was taking further steps to widen the area of such arrangements — Dr EDITH SUMMERSKILL replied Reciprocal arrangements are in operation with Northern Ireland and the Isle of Man for National Insurance, Industrial Injuries Insurance, and Family Allowances with the Irish Republic for Sickness Maternity, and Unemployment Benefits, and for the insurance of seamen with New Zealand for Family Allowances and with France for National Insurance and Industrial Injuries Insurance A multilateral agreement on social security signed by the five Brussels Treaty Powers has been ratified by this country Negotiations are taking place for further agreements with Australia, the Irish Republic, France, Belgium the Netherlands Luxembourg, Denmark Italy and Switzerland Negotiations with the Federal Republic of Germany are due to begin next month The possibility of making bilateral and multilateral agreements on social security similar to those made by the Brussels Treaty Powers is being examined by a Committee of Experts set up by the Council of Europe

Industrial Pneumoconiosis

In answer to a question Dr SUMMERSKILL said that since July 25 she had extended insurance under the Industrial Injuries Act against pneumoconiosis to persons using power driven tools to free metal castings from adherent siliceous substances She was fully aware that pneumoconiosis required very careful investigation and therefore she was referring the whole matter to the Industrial Injuries Advisory Council.

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis during the week ended Nov 11 were paralytic 161 (147), non-paralytic 64 (57), total 225 (204) The figures for the previous week, compared with which there was an increase of 21 notifications, are in parentheses Notifications for the corresponding weeks in 1947 and 1949 totalled 210 and 316

Total uncorrected notifications for 1950 up to and including the week under review are 7972 The corresponding figures for 1947, 1948, and 1949 are 8475, 2113, and 5905

Significant increases compared with the preceding week occurred in Cheshire (10), Dorset (10), and Durham (6) The most significant decreases were in Warwick (5) and Denbigh (5)

It is unlikely that this check in the recent steady decline of notifications is more than transitory

In England Now

A Running Commentary by Peripatetic Correspondents

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I don't want to libel the B B C, but unless memory plays me very false everything on their printed menu was scratched and the listening ear and hungry soul were fed exclusively on news, inevitably bad, on boasts of the incredible number of beds provided for tomorrow's civilian gassed and wounded, on calls to action strongly tinged with 'take cover" and 'safety first," and on something that for want of a more descriptive name must be called music

I felt compelled to listen, in case some real news came through, and because I had nothing else to do, but it brought me very low There was no real war, nothing dropped from the skies, and yet, it seemed, every flower of our civilisation was as dead as dahlias after the first frost, and weeds were rushing in to fill the gaps Once before "the lights had gone out all over Europe," but then at least there had been darkness and the flash of guns, this time it was as though every decent light went out at one puff or switch off and in their place shone neon signs advertising chewing gum Up to now, wars had been heralded by drums and trumpets, ours came in to the wailing of saxophones and the moans of the crooner Trumpets, if there were any, had mutes in their mouths

I had suffered before from cardioptosis but this was a notable attack The heart may not have reached the boots but it sagged deep into the pelvic cavity and there it stayed for an eternity of days—perhaps seven—and then the thing happened It happened, I think, at some unlikely time of day and unannounced—probably it followed official instructions about "evacuation" There was the sound of an orchestra tuning up, a pause, and then—as it were a skylark singing in November—the Overture to the Magic Flute

The heart, beating wildly, rose from the pelvis to the upper thorax, traversing the diaphragm, which for some time went into fibrillation Presently both heart and diaphragm settled down, and that is the end of the story, but who, I still want to know, was the unnamed national hero who assembled and conducted that orchestra and chose that work to play? Who were the players—angels from Heaven? How many, besides myself, walking in darkness, suddenly at that moment saw a great light? How many, eleven years later, dare not tell that simple story by word of mouth because they would again be seized by fibrillation of the diaphragm?

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Years ago, the hospital outpatient who didn't know the ropes was lucky to be seen by the consultant within four hours, and many spent the day on the job, but I had hoped things were different in these halcyon days Apparently I was wrong

Three weeks after a small orthopædic operation my wife received a card summoning her to Mr X's 10 A.M outpatient session at a teaching hospital in the provinces After a twisty 15-mile car journey, she duly reported to the orthopædic subsection 5 minutes before time Queues stretched in all directions With the simple faith of the novice she asked a porter where Mr X held his clinic 'Let me see your card he replied "Why, you should be in the *general* outpatients along there" She hobbled a painful quarter mile in the direction indicated to further queues No hoarding enlightened her search, so she inquired for Mr X s clinic from another porter "Never eard of im," he retorted, "but since 'e's orfapedic it'll be in the orfapedic outpatients quarter mile along there 'But I've just come from there," she

their appointment and found that Dr J D Paulett was granted by the L C C a house compulsorily acquired from a private owner Having got those premises he applied to the Medical Practices Committee saying that he had been granted the doctor's house on the estate and asked for permission to practise At that time other doctors had submitted their names to the L C C as wishing to practise, but only the name of Dr Paulett appeared to have gone forward, and as there was only one applicant in the field the Medical Practices Committee had no option but to appoint him One of the three other doctors who were later appointed also applied to the committee for permission to practise, saying he had premises and facilities given him by the L C C Miss Hornsby-Smith urged that the position of the M P C was prejudiced when they had only one name submitted to them and when that applicant claimed that he had the premises and that virtually he was allowed to start up in practice The L C C by deciding which doctors should be allocated a house from which to practise were in fact choosing the doctors on this estate and usurping the statutory right of choice of the M P C She asked that applications by doctors wishing to practise in these areas should be submitted to the M P C who could then say to the local authority "we choose doctors A, B, and C, and we look to you to provide accommodation for them" Mr PERCY DAVIES Is the hon Lady saying that these doctors were chosen because they were Communists? Miss HORNSBY SMITH replied that she thought the selection of names to go forward to the Medical Practices Committee showed signs of definite political prejudice

Mr ARTHUR BLENKINSOP bitterly resented the manner in which the subject had been raised, especially the implicit suggestion that the political views of doctors should be taken into account on their appointment The whole medical profession desired to have freedom for doctors to set up practice On the broader issue raised, he continued, any doctor might apply to practise in an area, and could only be refused if the area was overdoctored Vacancies were advertised only when a sitting doctor withdrew or where the area was underdoctored

Dr CHARLES HILL thought this was an instance of a general difficulty underlying the machinery of the Medical Practices Committee If a vacancy arose through the death or retirement of a doctor and it was decided to fill the vacancy, and the full procedure of advertisement and selection had been followed, then if a doctor—whether he was an applicant or not—had obtained by purchase or otherwise premises from which the practice was conducted, or the only appropriate professional premises in the area, it was difficult to make an effective choice of any other person. That was the difficulty which the Medical Practices Committee, with the coöperation of the medical profession, were trying to tackle Whatever other issues might be involved in this case, there was, he urged, a general problem It would be a pity, he thought, if the new National Health Service machinery were short-circuited by a local authority who named a doctor as tenant He thought there was good reason for the L C C to follow another method to ask the official machinery to advertise the vacancy and to allot the house to the selected doctor One general method should be adopted, approved by the Ministry of Health and under the supervision of the M P C, to avoid this instance of tenancy being the best part of the law

Mr BLENKINSOP said he appreciated the points which Dr Hill had raised and the Ministry would be prepared to look into the question What he resented so deeply was the implication that this was tied up with some preferential treatment for alleged Communists There was certainly a problem in relation to doctors' premises, and he could give an assurance that the point would be considered in relation to the discussions which the Ministry were already having with the British Medical Association

*** *See also p 655*

Penicillin (Merchant Ships) Bill

On Nov 14, Lord SHEPHERD moved the first reading of this Bill Its purpose is to amend the Penicillin Act so that penicillin can be used for the treatment of persons on board merchant ships which do not carry a doctor Cases have occurred where members of the crew of a merchant ship suffering from an infected wound, for example, have not been able to have treatment with penicillin if there was no doctor on board It is now felt that the experience gained in the use of penicillin makes it possible to define when it can and cannot safely be used If the Bill is approved, advice on these lines will be included in the *Ship Captain's Medical Guide* which is carried on merchant ships in accordance with the Merchant Shipping Act, 1894

QUESTION TIME

Incidence of Tuberculosis

Replying to a question Mr A BEVAN said that 52,041 cases of tuberculosis were notified in England and Wales in 1949 He thought that figure showed an increase Those increases were due to the fact that mass radiography was now being used Although more cases of respiratory tuberculosis were being discovered—the increase in notifications being 5½%—there had been a decrease in deaths over the last five years of 12½%

In answer to further questions he said that patients with early tuberculosis discovered by mass radiology tests were referred to a chest physician and treated according to their need and the facilities available There was some delay in the provision of treatment, but fortunately the treatment which was being given was reducing the number of deaths The general over all position was certainly improving He agreed that the real problem was the shortage of nurses. That was the reason why he had circularised hospital authorities asking them to make beds available for this type of case in general hospitals He had had an interim report, and there had already been a very large increase in the number of beds available Annual returns as at Dec 31 last showed that the number of patients waiting for accommodation in tuberculosis hospitals and sanatoria was then approximately 11,000 He had been prepared to consider making use of the large number of beds available in Switzerland, but currency difficulties were involved He would be able to give the House before long a report on the progress made in providing hospital beds for tuberculosis treatment in this country

Increased Cost of Private Hospital Wards

In answer to a question Mr BEVAN stated that the increases for private ward treatment in the Merseyside hospitals, where the costs had increased by 100% from July 1948, up to September, 1950, were partly due to increased costs and partly to the fact that the charge now covered the full cost in all cases

Mr H D OAKSHOTT As the use of private wards must relieve the pressure on public wards, will the Minister consider reducing the charges for private wards? Mr BEVAN That would really mean that a larger number of people would be able to pay for beds at the expense of others

Replying to Mr G H OLIVER, Mr BEVAN said if he was supplied with particulars of cases where admission to hospital was medically urgent and had been refused he would be glad to make inquiries Mr OLIVER Is the Minister aware that I have sent him particulars of a case where the patient after waiting for 11 months to enter a hospital was able to obtain admission as a private patient in less than 11 days?—Mr BEVAN If the patient was not suffering from anything requiring urgent medical treatment no problem arises, but he had no right to go into hospital ahead of people in greater medical need Mr OLIVER But if the patient was not suffering from something requiring urgent medical attention why could he enter the hospital as a paying patient in under 11 days?—Mr BEVAN I quite agree about that and I will investigate the matter if particulars are sent to me I am far from satisfied with the way in which it is possible for doctors to get their private patients into hospitals

Cost of N H S Prescriptions

Mr R H TURTON asked the Minister whether, in view of the evidence received from the Joint Pricing Committee for England that the average cost of prescriptions per person from Jan 1 to Sept 30 1949, was 11*s* 4½*d* he was prepared to review the present dispensing capitation fee of 6*s* 6*d*

paid to doctors who supplied medicines to patients on their National Health Service lists —Mr BEVAN replied No, Sir The figure quoted and the fee are not comparable In addition to the fee, pro rata payment is made to the doctors for certain individual items supplied

Part-time Nurses

In answer to a question Mr BEVAN stated that the number of part time nurses had never been higher than the present total of 25,000 It was about 17,000 when the National Health Service began

Imports of Aureomycin

In answer to a question Mr BEVAN stated that 140,075 grammes of Aureomycin,' apart from small quantities for sample and trial purposes had been imported from the United States of America during the nine months ended Sept 30 1950

Food Allowances for the Tuberculous

In answer to Miss M P HORNSBY SMITH who asked why the priority ration of an extra ounce of cooking fat and bacon was no longer included in priority food rations granted to sufferers from tuberculosis, Mr MAURICE WEBB said in view of the present levels of the bacon and cooking fat rations his medical advisers were satisfied that there was no need to continue these extra rations

Reciprocal Insurance Benefits

Sir WILLIAM DARLING asked the Minister of National Insurance what countries had accepted reciprocal insurance arrangements with the United Kingdom and if she was taking further steps to widen the area of such arrangements — Dr EDITH SUMMERSKILL replied Reciprocal arrangements are in operation with Northern Ireland and the Isle of Man for National Insurance Industrial Injuries Insurance, and Family Allowances with the Irish Republic for Sickness, Maternity, and Unemployment Benefits, and for the insurance of seamen with New Zealand for Family Allowances and with France for National Insurance and Industrial Injuries Insurance A multilateral agreement on social security signed by the five Brussels Treaty Powers has been ratified by this country Negotiations are taking place for further agreements with Australia, the Irish Republic, France Belgium, the Netherlands Luxembourg, Denmark Italy and Switzerland Negotiations with the Federal Republic of Germany are due to begin next month The possibility of making bilateral and multilateral agreements on social security similar to those made by the Brussels Treaty Powers is being examined by a Committee of Experts set up by the Council of Europe

Industrial Pneumoconiosis

In answer to a question Dr SUMMERSKILL said that since July 25 she had extended insurance under the Industrial Injuries Act against pneumoconiosis to persons using power driven tools to free metal castings from adherent siliceous substances She was fully aware that pneumoconiosis required very careful investigation and therefore she was referring the whole matter to the Industrial Injuries Advisory Council

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis during the week ended Nov 11 were paralytic 161 (147), non paralytic 64 (57), total 225 (204) The figures for the previous week, compared with which there was an increase of 21 notifications, are in parentheses Notifications for the corresponding weeks in 1947 and 1949 totalled 210 and 316

Total uncorrected notifications for 1950 up to and including the week under review are 7972 The corresponding figures for 1947, 1948, and 1949 are 8475, 2113, and 5905

Significant increases compared with the preceding week occurred in Cheshire (10), Dorset (10), and Durham (6) The most significant decreases were in Warwick (5) and Denbigh (5)

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I had suffered before from cardioptosis but this was a notable attack The heart may not have reached the boots but it sagged deep into the pelvic cavity and there it stayed for an eternity of days—perhaps seven—and then the thing happened It happened, I think, at some unlikely time of day and unannounced—probably it followed official instructions about "evacuation" There was the sound of an orchestra tuning up, a pause, and then—as it were a skylark singing in November—the Overture to the Magic Flute

The heart, beating wildly, rose from the pelvis to the upper thorax, traversing the diaphragm, which for some time went into fibrillation Presently both heart and diaphragm settled down and that is the end of the story, but who, I still want to know, was the unnamed national hero who assembled and conducted that orchestra and chose that work to play? Who were the players—angels from Heaven? How many, besides myself, walking in darkness, suddenly at that moment saw a great light? How many, eleven years later, dare not tell that simple story by word of mouth because they would again be seized by fibrillation of the diaphragm?

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Years ago, the hospital outpatient who didn't know the ropes was lucky to be seen by the consultant within four hours, and many spent the day on the job, but I had hoped things were different in these halcyon days Apparently I was wrong

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Let me see your card' he replied "Why, you should be in the *general* outpatients along there" She hobbled a painful quarter mile in the direction indicated to further queues No hoarding enlightened her search, so she inquired for Mr X's clinic from another porter 'Never 'eard of 'im," he retorted, "but since 'e's orfapedic it'll be in the orfapedic outpatients quarter mile along there 'But I've just come from there," she

remonstrated "Well, then," he said, "they've told you wrong, me dear—see" Now completely bewildered, she asked a passing lady doctor, who thought Casualty Sister would know, and Casualty Sister said she'd ring the chief outpatient secretary and find out An hour after the appointed time the reply came "Mr X's clinic is where you first reported" So back she went, got a card from one secretary, took it to a second secretary, and was given an appointment for another day On producing her original summons she was reprimanded and told to sit at the bottom of the queue Hours dragged by At 12 45 she was at last ushered into the holy-of-holies—and seen by the house surgeon

She was late home, and I needed the car to drive 25 miles to my afternoon clinic So my poor patients had a distressful wait The bitterest pill came two days later, when I bustled into my other hospital to find that the outpatient department had been remodelled and restaffed while I was on holiday "Where are Surgical Outpatients being held," I asked a pert young piece behind the office window "Take your place at the bottom of the queue and you'll find out," she said I will not record my reply

* * *

"Please come quickly, Doctor Grandfather has died of the soup"

I had just returned from a holiday, where I whiled away many a stormy afternoon following Detective-Inspector Alleyn or Mr Albert Campion in their relentless pursuit of homicides, so even as I grabbed my bag and accompanied the agitated young lady across the road to her house I had the whole story clearly in my mind

He Died of the Soup made a good title I should be told that after taking his first mouthful of soup the old man leapt to his feet, gasping "I've been poisoned," and then crashed to the floor, his rubicund complexion turning a dusky blue I should detect a faint odour of bitter almonds There would be four suspects the unmarried daughter, whose proposed marriage had been banned by her father only yesterday in a stormy scene, the married daughter with whom the father had lived and whose life he had made a misery, her husband, who needed the old man's money to pay his debts and start a business, and finally the attractive young granddaughter, apple of the old man's eye, who was leading me over, and who by all the rules of detective fiction must have done it I stole a glance at her with my steely grey eyes (I had decided to be an Alleyn, though my habitual vacant expression would better suit a Campion) She was registering horror and grief so well that for a moment I thought they were real, then I remembered the theatre club photograph I would find on the dining-room piano, with her in the centre as Cleopatra, and her secret histrionic skill was revealed

Less than two minutes had passed since the tragedy when I was ushered into the dining room, determined to miss no clue But a single glance at the body shattered my reconstruction of the crime For the old man had evidently pitched forward on to the table, taking his own plate of soup in the waistcoat and his son's on the forehead Now he lay crumpled in his chair, the streaks of pea soup down his face clashing hideously with his purple lips and mauve cheeks On auscultation no heart beat disturbed the stillness

A horde of small grandchildren hung round the door, their eyes bright with the prospect of missing afternoon school "Do something, Doctor," their mother begged tearfully, while her husband clumsily patted her shoulder It was the work of a moment for me to fill a syringe with 'Coramine and plunge the needle between the old man's ribs Five seconds later he drew a deep breath and then began to pant steadily I gazed fascinated The light died out of the grandchildren's eyes, the daughter's sobs gave place to a less becoming sniffle, and her husband dropped her shoulder and went out to the kitchen The air was heavy with disapproval of my tampering with the course of nature In a few minutes the old man opened his eyes, looked long at me, and finally glared at his married daughter Then he set the seal on my discomfiture 'Who," he asked peevishly, told you to send for the doctor?"

Letters to the Editor

PHYSICAL AND BIOLOGICAL EFFECTS OF ATOMIC EXPLOSIONS

SIR,—Medical readers of your correspondent's very able article on this subject will probably agree with the author's last sentence They will "find it difficult to remain optimistic" If in addition to the effects of atomic explosions they consider the hazards from biological and chemical warfare, and all these added to saturation bombing with high explosive and incendiaries as well as guided and rocket missiles, optimism will indeed seem misplaced But why be either optimist or pessimist? why not realist?

Your correspondent gives an excellent précis of the American book on the subject, with a few interpolations of his own to which he is of course entitled

Nearly all the information in the book, and a good deal besides, has been in the hands of those working at Civil Defence measures for a considerable time, and since I have had more opportunity than many to become conversant with the extensive research, surveying, and general study going on in a dozen centres in this country, and many more elsewhere, I think it important to insist that, however bad a business total war would be, a resolute trained and informed public (the nation at war), with all the aids that would be forthcoming, would find that they had it in their power to face any attack The losses might be frightful but need not be overwhelming We have the resolute public We must have the informed and trained public

E ROCK CARLING

*** As a basis for the realism Sir Ernest demands, we are publishing articles on the medical implications of new methods of warfare We do so because the risk of war, in this country as elsewhere, can no longer be ignored by the profession, which must prepare itself for what it may have to do To some of us the Civil Defence training of 1938–39 seemed largely futile - what could the citizen hope to achieve, against air attack, with a bucket and shovel? But the authorities were right then, and they are right now, in bidding us learn to do what we can This will always be more than we suppose possible — ED L

REVOLT AT KINGSTON

SIR,—Your article of Nov 11 raises four distinct issues on all of which your conclusions, which showed a considerable hesitancy as if you knew the whole story had not been told, were far from correct

1 The first issue is that of the regional hospital board's failure to consult or consider local feeling and its refusal to give information as to its plans and the reason for them The issue raised is how does a board give the public that information if the whole press, lay and professional, refuses to publish it? Local papers, with the exception of the *Richmond & Twickenham Times*, have given entirely one sided and inaccurate versions of the proposals Nationally, news has to be "exciting", so the "revolt of 26 doctors" becomes more important and space worthy than the plans of the R H B to provide the best possible service for 225,000 people having only some 1100 beds with which to do it

On Nov 5 one newspaper used more than a column of its scanty space to a statement of the case against the R H B On Nov 10 the hospital management committee heard a statement by its chairman which in six foolscap pages, handed to the press, set out the board's policy as he saw it On Nov 12 the same newspaper published 14 lines on the subject without one word of that statement

How can we then tell the public the facts if this is how the press treats them? The press has been present at every meeting of both R H B and H M C at which this

question has been discussed, and all reports on it have been made available to them

2 The second issue is who is to decide on the best use of hospital beds and how is the decision to be reached? If the amount of consideration given to the Kingston Victoria's case is not enough, what more must be done? Here, briefly, is its history In 1938 the Surrey Committee of the Nuffield Provincial Hospitals Trust discussed the future of the hospital and asked local views on the question In 1941 the two Kingston hospitals were used as an outstanding example of how *not* to organise a hospital service in discussions on the B M A's Medical Planning Commission, which declared that "from the two separate hospital systems there should be evolved one coördinated system, unified centrally and locally" In 1942 a committee met in Kingston to discuss this and other health problems and the Victoria Hospital was represented at these meetings In 1948 the G.P s who had previously exercised a close control on the number of doctors using the Victoria, began to add both G P s and specialists to the staff in order to forestall changes under the N H S

Then came the medical review of the region, when a subcommittee of the board's medical advisory committee visited the Victoria and met the whole of the staff I had the privilege of attending both as a member of the evidence-collecting committee and as one of the Victoria's staff. When asked what was the greatest need of the *district* the reply was, unanimously, "maternity and gynæcological beds, with orthopædic a close second" This was confirmed later when the local borough council sent a resolution to the board calling for increased maternity accommodation and when the Kingston medical advisory committee declared that "the provision of an adequate gynæcological unit must be the first consideration"

Those opinions were considered by the medical review committee, by the Surrey area committee, by the maternity subcommittee, and finally by the region's medical advisory committee which decided on the present scheme. It is a gross misrepresentation to talk of the Victoria being closed down There are 10 male beds to be moved, and that is all the change from the patient's angle It will cease trying to do medicine, surgery, gynæcology, urology E.N T, and eyes in 32 beds with a total medical staff of 34 while the real Kingston Hospital (older and doing 80% of the work of the district) is also doing all these jobs across the street As the Hospital Survey (Gray and Topping) showed this area has less than half the beds it needs and must use them to the maximum

3 But what about G.P beds? The South-West Metropolitan Regional Hospital Board and its medical advisory committee are on record unanimously as in favour of providing such beds as it can for G P.s in the terms of Circular 132 of the Ministry for such things as are within the competence of the family doctor The average bed occupancy of the Victoria last year was 33 and the board has offered 38 in exchange It has offered money to make such changes as the G P s want, and it expected coöperation in a trial of how G.P.s can staff and run a hospital inside a hospital service mainly based on specialists

But we must not exaggerate this question In the country as a whole *not more than* 10% of G.P s have hospital beds and not more than 5% of the total of hospital care is given by G P.s Kingston Victoria Hospital was in transition with G.P s playing a smaller and smaller role as the years went on At neighbouring Richmond the G.P s have themselves changed their hospital to a specialist unit without any public outcry at any time In this hospital group there are 121 G P.s There are no beds solely under G P s All the smaller hospitals have regular specialist cover The regional board's offer to equip the Surbiton Annexe for the G.P s to be run and controlled by themselves—as many of them as cared to accept the invitation—should have been welcomed as a first attempt to deal with "one of the potential weak spots in the service"

Let me add that the staff at Kingston Hospital are in the closest touch with the G P s of the area and that there is an open access laboratory available, and that X rays can be obtained either by direct access at the Victoria or through the physicians at the Kingston Hospital—the choice being left to the G P s

When the present changes at Kingston are complete it can be an excellent hospital group, with a G P hospital, 600 beds for acute medicine and surgery, 200 beds for chronic, sick, a 130 bed maternity unit and gynæcological unit, 60 children's beds, 48 for tuberculosis, 36 for orthopædics, and 30 for infectious diseases, with the long established eye unit of 12 beds at Richmond.

4 Then why revolt and what is to be our attitude in the matter? Let me remind you that the staff at Kingston Victoria have never held a meeting to discuss this question It is not accidental that those members of the staff able to put the matter in perspective have been excluded from any discussions that have taken place The scheme has the support of the 80% of the population who use Kingston Hospital for all their major ailments The same doctors who make so much disturbance about the Victoria send the bulk of their cases into Kingston Hospital It must clearly be recognised that the small number of patients using the Victoria are the privileged section of the G P s' practice and that they are not unconnected with whatever private practice continues to exist or with the fact that 10 of its 32 adult beds have hitherto been Section 5 beds The National Health Service and its agencies have to provide a service for the whole population not for privileged groups

Wiser counsels must prevail No patient will suffer medically by the proposed changes, but the longer the foolish revolt against the health service goes on the lower becomes the standing of the family doctor in the eyes of the sick To ally oneself with one political party and use high pressure publicity methods in a matter which is beyond the political stage, and at the same time to refuse to sit round a table with those who have the arduous task of running the hospitals, is to bring the medical profession into disrepute.

Kingston Group Laboratory D STARK MURRAY

INTERNATIONAL SOCIETY OF HÆMATOLOGY

SIR,—In your account (Sept 23) of the Cambridge congress of the International Society of Hæmatology in some places my real meaning has been lost Since several of my colleagues have been quick to charge me with a complete change-about from my usual opinions, I make haste to try to make them clear

In describing the session on "Hypersplenism," in which there were several papers dealing with splenectomy in leukæmia and related states, your report says that I "had seen no good results in eighteen splenectomies done for leukæmia" This is certainly not the case, since I have seen brilliant results occasionally What I *did* say was that our own results did not warrant undue optimism for the relief of the anæmia by splenectomy in most cases of leukæmia I thought that some degree of caution was necessary against the indiscriminate use of this operation in leukæmia The unkindest cut however, was a statement that the discussion had confirmed my growing opinion "that hypersplenism was a romantic subject devoid of scientific truth" In view of my known propensity to espouse the cause of hypersplenism vigorously and to try on every occasion possible to adduce evidence in favour of it, this statement hardly seems credible I hasten to point out, therefore, that

remonstrated "Well, then," he said, "they've told you wrong, me dear—see" Now completely bewildered, she asked a passing lady doctor, who thought Casualty Sister would know, and Casualty Sister said she'd ring the chief outpatient secretary and find out An hour after the appointed time the reply came "Mr X's clinic is where you first reported" So back she went, got a card from one secretary, took it to a second secretary, and was given an appointment for another day On producing her original summons she was reprimanded and told to sit at the bottom of the queue Hours dragged by At 12 45 she was at last ushered into the holy-of-holies—and seen by the house surgeon

She was late home, and I needed the car to drive 25 miles to my afternoon clinic So my poor patients had a distressful wait The bitterest pill came two days later, when I bustled into my other hospital to find that the outpatient department had been remodelled and restaffed while I was on holiday "Where are Surgical Outpatients being held," I asked a pert young piece behind the office window "Take your place at the bottom of the queue and you'll find out," she said I will not record my reply

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I had just returned from a holiday, where I whiled away many a stormy afternoon following Detective-Inspector Alleyn or Mr Albert Campion in their relentless pursuit of homicides, so even as I grabbed my bag and accompanied the agitated young lady across the road to her house I had the whole story clearly in my mind

He Died of the Soup made a good title I should be told that after taking his first mouthful of soup the old man leapt to his feet, gasping 'I've been poisoned," and then crashed to the floor, his rubicund complexion turning a dusky blue I should detect a faint odour of bitter almonds There would be four suspects the unmarried daughter, whose proposed marriage had been banned by her father only yesterday in a stormy scene, the married daughter with whom the father had lived and whose life he had made a misery her husband, who needed the old man's money to pay his debts and start a business, and finally the attractive young granddaughter, apple of the old man's eye, who was leading me over, and who by all the rules of detective fiction must have done it I stole a glance at her with my steely grey eyes (I had decided to be an Alleyn, though my habitual vacant expression would better suit a Campion) She was registering horror and grief so well that for a moment I thought they were real, then I remembered the theatre club photograph I would find on the dining-room piano, with her in the centre as Cleopatra, and her secret histrionic skill was revealed

Less than two minutes had passed since the tragedy when I was ushered into the dining room, determined to miss no clue But a single glance at the body shattered my reconstruction of the crime For the old man had evidently pitched forward on to the table, taking his own plate of soup in the waistcoat and his son's on the forehead Now he lay crumpled in his chair, the streaks of pea soup down his face clashing hideously with his purple lips and mauve cheeks On auscultation no heart beat disturbed the stillness

A horde of small grandchildren hung round the door, their eyes bright with the prospect of missing afternoon school "Do something, Doctor," their mother begged tearfully, while her husband clumsily patted her shoulder It was the work of a moment for me to fill a syringe with 'Coramine and plunge the needle between the old man's ribs Five seconds later he drew a deep breath and then began to pant steadily I gazed fascinated The light died out of the grandchildren's eyes, the daughter's sobs gave place to a less becoming sniffle, and her husband dropped her shoulder and went out to the kitchen The air was heavy with disapproval of my tampering with the course of nature In a few minutes the old man opened his eyes, looked long at me, and finally glared at his married daughter Then he set the seal on my discomfiture 'Who," he asked peevishly, told you to send for the doctor?"

Letters to the Editor

PHYSICAL AND BIOLOGICAL EFFECTS OF ATOMIC EXPLOSIONS

SIR,—Medical readers of your correspondent's very able article on this subject will probably agree with the author's last sentence They will "find it difficult to remain optimistic" If in addition to the effects of atomic explosions they consider the hazards from biological and chemical warfare, and all these added to saturation bombing with high explosive and incendiaries as well as guided and rocket missiles, optimism will indeed seem misplaced But why be either optimist or pessimist? why not realist?

Your correspondent gives an excellent précis of the American book on the subject, with a few interpolations of his own to which he is of course entitled

Nearly all the information in the book, and a good deal besides, has been in the hands of those working at Civil Defence measures for a considerable time, and since I have had more opportunity than many to become conversant with the extensive research, surveying, and general study going on in a dozen centres in this country, and many more elsewhere, I think it important to insist that, however bad a business total war would be, a resolute trained and informed public (the nation at war), with all the aids that would be forthcoming, would find that they had it in their power to face any attack The losses might be frightful but need not be overwhelming We have the resolute public We must have the informed and trained public

E ROCK CARLING

*** As a basis for the realism Sir Ernest demands, we are publishing articles on the medical implications of new methods of warfare We do so because the risk of war, in this country as elsewhere, can no longer be ignored by the profession, which must prepare itself for what it may have to do To some of us the Civil Defence training of 1938–39 seemed largely futile - what could the citizen hope to achieve, against air attack, with a bucket and shovel? But the authorities were right then, and they are right now, in bidding us learn to do what we can This will always be more than we suppose possible—ED L

REVOLT AT KINGSTON

SIR,—Your article of Nov 11 raises four distinct issues on all of which your conclusions, which showed a considerable hesitancy as if you knew the whole story had not been told, were far from correct

1 The first issue is that of the regional hospital board's failure to consult or consider local feeling and its refusal to give information as to its plans and the reason for them The issue raised is how does a board give the public that information if the whole press, lay and professional, refuses to publish it? Local papers, with the exception of the *Richmond & Twickenham Times*, have given entirely one sided and inaccurate versions of the proposals Nationally, news has to be "exciting", so the "revolt of 26 doctors" becomes more important and space worthy than the plans of the R.H B to provide the best possible service for 225,000 people having only some 1100 beds with which to do it

On Nov 5 one newspaper used more than a column of its scanty space to a statement of the case against the R H B On Nov 10 the hospital management committee heard a statement by its chairman which in six foolscap pages, handed to the press, set out the board's policy as he saw it On Nov 12 the same newspaper published 14 lines on the subject without one word of that statement.

How can we then tell the public the facts if this is how the press treats them? The press has been present at every meeting of both R H B and H M C at which this

REGISTRARS

SIR,—The threatened cut in hospital registrar establishment seems to me inevitable, but I disagree seriously with its suddenness A reduction of 50% in this group immediately—or possibly spread in a limited way over two years by retention in temporary gradings—is bound to cause serious unemployment and dissatisfaction Unless this change is accompanied by a good deal of reorganisation, which it would seem impossible to institute overnight, the efficiency of many hospitals must be impaired There is much truth in the suggestion that registrars do the work of hospitals

The situation at my own hospital will serve as an illustration The present staff for 450 acute and 300 chronic patients (the latter, I believe, seriously underdoctored and undernursed) is

	Specialists	*Registrars*	*House-officers*
Full time	8	11	10
Part-time (as units)	1¾ approx	½ approx	nil

The cut can be expected to reduce our registrars to 6 (possibly 4 registrars and 2 senior registrars) For it seems to be a maxim of the hospital service to scale things up or down according to previous *local* standards and never according to national standards the percentage change seems to be the only thing standardised How shall we manage two large medical teams, two surgical teams, 30 gynæcology and 80 midwifery beds (expanding numbers), and anæsthetics—apart altogether from smaller departments—with these 6? Here are some possible ways

1 *Work the specialists harder?* This means the full time staff, because, as is well known, part-time people are seldom at hand for emergencies One colleague lives 20 miles away, and the average distance for all of us is 8½ miles The hospital does an enormous amount of emergency work, and if a team had no registrar resident on duty, surgeons, physicians and midwives would have to live in or risk being fetched back probably 10–15 times per month This at present happens on the surgical firms when the registrar is on holiday The non urgent work freed by the absent registrar would also be enough to make great inroads on the consultants time and this would be a permanent obstruction to their routine work, and would seriously interfere with necessary consideration, discussion, reference, and so on

2 *Work the remaining registrars harder?* With rare exceptions this is impossible

3 *Work housemen harder?* This is possible in some cases The big trouble is the question of responsibility by a rather "green" officer, especially at night

4 *Appoint more specialists?* Here is a partial answer, but there seems to be no immediate prospect of increasing the specialist establishment As an example of the official frame of mind, S H M O regrading has been delayed till 1951 In any case we need resident responsibility, and there is no general arrangement or accommodation for this My own department (anæsthetics) is already top heavy—we have 1½ non resident specialists and a full time resident registrar

5 *Appoint more housemen?* Again a partial answer First there is the difficulty about responsibility, already mentioned Secondly there is a shortage of applicants, and this is sure to become more acute for a time in special departments when the registrar bottleneck is narrowed Housemen want supervision which shortage of staff prevents experience which we can offer freely, a 'handle' to a reference which we cannot often give and pleasant surroundings, which we have not Even now we cannot always fill vacant posts

The Ministerial alternative of employing part time general practitioners will certainly not work in most town areas Again, we need locally resident people for emergencies many of our G P s live away from the district

I do not think one can argue seriously against the reduction of registrar complements, but the change ought to be a gradual one and accompanied by changes in organisation and staffing so that the work they now do will continue to be done

London E 11 E J W BARNARD

SIR,—It was reasonable to assume that behind the creation of large numbers of registrar posts during the last two years there was some general plan If the health service accepted a man for training, having in mind the Spens report, it was natural to suppose that, with a planned scheme, there would be a fair chance of his obtaining an appointment for which he had been trained It now appears that the Ministry of Health has at last realised, too late, that there are more registrars than can possibly hope for consultant posts with present establishments (These establishments are, on Lord Moran's authority, only 56% of the optimum size[1]) What is probably more to the point, expenditure has to be cut, and what more convenient way than to cut where politically the hurt is least and where those affected are, with assistants in general practice, the most vulnerable members of the profession?

A registrar, like most others, now has a poor chance of obtaining any employment in general practice—let alone congenial employment—with general practice constituted as it is in many areas at present.

For the hospital service one risk of the cuts is that registrars will be concentrated in the teaching hospitals. No student can learn medicine properly without attending a hospital which serves fully a definite community, taking all comers who need attention, and associating itself with the general practitioners in the community In London many non teaching hospitals are beginning to satisfy these criteria The Ministry's ruling may put a stop to this progress, which cannot continue without registrars with experience and with enthusiasm Enthusiasm cannot be got—still less maintained—unless these men have a future to look forward to It cannot be got by staffing with junior hospital medical officers with no future, or by clinical assistants from general practice even if this were possible

Many registrars are in the 30s with a wife and family to support and four to six years' war service behind them. For such men there is little attraction in the Armed Services, Middle East, or South East Asia They have usually had quite enough of all three already Moreover they, like many others in the Armed Forces and Colonial Service, are wondering what they would do on retirement at a relatively early age with a poor pension and family commitments It is already extremely difficult for a man of 40 to get into general practice, how much more difficult for a man of 50 or 55! Consultant practice would be out of the question

The crux of the matter is that the Minister of Health plus some senior members of the profession would rather see the public get their bottles of medicine, wigs, false teeth, glasses and administrators than make the necessary number of consultant appointments. There is now to be direction of labour by the old trick of economic blackmail We were told that this would never happen again

Εἶδον

SIR,—At last the number of trainee specialists is to be reduced to something approaching mathematical equilibrium with the consultant posts available Few thoughtful registrars can fail to welcome the impending finale of this most unsatisfactory epoch Were the process of thinning to be as fair as possible in the circumstances, and were all hope not removed, hundreds, including myself, though bitterly disappointed, would be prepared, if unlucky, to bow before the axe But there are portents in your annotation of Nov 11 that the thing may not be done with equity, and I wish to state two points of much importance

In this annotation you say that a Scottish survey showed there to be many more vacant consultantships

1 See *Lancet* Oct 28 1950 p 493

I am still convinced (*a*) that hypersplenism exists, and (*b*) that a certain amount of evidence for it is present Unfortunately, this is almost all in the clinical field and as yet no clear cut experimental evidence has been brought to bear on the problem

On my contribution to the discussion of "hæmolytic anæmias" the report again goes astray It states that "experience with leukæmia, even when auto hæmolysins were present, was uniformly unfavourable" This is by no means what I said, since I brought to the meeting the report of three cases of leukæmia or lymphosarcoma with symptomatic hæmolytic anæmia treated with A C T H and in which the results of treatment were striking The report goes on to say that "A C T H has been tried, since it is said to influence antibody formation, but the results were equivocal" This statement too is curious, in that the latter part of my paper dealt with the marked effects of A C T H in producing a reduction in abnormal antibody with at the same time dramatic remissions in the hæmolytic process The results were anything but "equivocal"

Further on it is recorded that I considered "A C T H is *not* itself of practical therapeutic value in leukæmias" This might be a fair statement for the acute cases, but in certain of the chronic varieties, particularly with a hæmolytic complication, or in the terminal anæmia or the exfoliative dermatitis of certain cases of chronic lymphocytic leukæmia, the results were at times of considerable value and therefore must be considered to be of practical importance

Two other small points The report is headed "International Congress of Hæmatology," and is called "the third of its kind" Actually it was the second congress of the International Society of Hæmatology

While in this critical mood, may I also take exception to a statement in your otherwise excellent leading article entitled Hæmatology? Here you say "much hæmatology, of course, lacks a really scientific basis, witness the discussions on hypersplenism and hæmolytic anæmias" To those of us who have worked busily in these fields, particularly in the latter one, where considerable exact knowledge has been obtained, this statement is, to say the least, a little disconcerting

WILLIAM DAMESHEK
Professor of Clinical Medicine, Tufts College Medical School
Blood Research Laboratory New England Centre Hospital, Boston Mass

DANGER OF HEXAMETHONIUM

SIR,—I wish to reinforce the warning given by Dr Hillis and Dr Kelly in your issue of Nov 11 In this department experience with hexamethonium is limited to five cases, but in one of these the reaction was far more severe than any yet described

The patient was a man, aged 30, with severe hypertension, reaching 230/130 mm Hg, which had, after thorough investigation, been diagnosed as "essential" His hypertension has been known to exist for 8 years, and 7 years ago he developed thrombosis of the central retinal artery His heart is now considerably dilated, and he had signs of pulmonary congestion

Test doses of hexamethonium bromide given intramuscularly and intravenously showed that he was unusually insensitive, even 100 mg intravenously on one occasion caused only a slight drop in blood pressure

Hexamethonium bromide was then given orally over a period of 10 days, the dose being stepped up cautiously from 0·25 g t d s to 1 5 g t d s on the 10th day No response of any kind was seen during this period, except slight constipation on the 7th and 9th days The basal blood pressure remained essentially unchanged at about 180/110 mm Hg On the morning of the 11th day he collapsed quietly and without warning when sitting in the w c He was not discovered for about half an hour, and was then found to be stuporose His blood pressure was 100/60 mm Hg The pupils were dilated and fixed, and his speech was slurred He was incontinent of fæces but bowel sounds were completely absent

This condition persisted for 24 hours, though his blood pressure rose to 180/100 mm Hg under the influence of adrenaline and ephedrine After this his blood pressure rose spontaneously to its previous levels Extensor plantar reflexes developed, the other signs persisted unchanged The ileus recurred intermittently for 9 days, varying in severity from day to day The cerebral condition is improving, but he is still drowsy and dysarthric after 16 days and has amnesia for the fortnight preceding his collapse

The precise causation of these complications appears to be (1) sudden excessive blockage of the autonomic ganglia (hypotension, pupillary paralysis, ileus, and incontinence), and (2) cerebral cortical ischæmia (drowsiness, amnesia, dysarthria, and extensor plantar responses)

This case strongly supports Dr Turner's warning in his article of Sept 2 that a new era of treatment has not come, and that the effects of so powerful a drug should always first be assessed in a hospital It would appear to be very risky to use the drug indiscriminately in hypertension, either in the outpatient department or in general practice, until more is known about the avoidance of such complications

J DONALD BALL
Department of Medicine Postgraduate Medical School of London, W 12

SITUATION VACANT

SIR,—Now that Bernard Shaw has gone, who will take his place as Hammer of the Doctors? A thorn in the profession's side for more than fifty years, Shaw nevertheless performed a valuable public duty as chief critic, for it will not have escaped the notice of observant onlookers how remarkably uncritical of itself is the medical profession Every profession needs to be jolted out of its smug complacency at regular intervals, and as it is obvious that, in the case of Medicine, such a shaking up is very unlikely to come from within the profession, then it must come from without—from a layman and, moreover, from a prominent layman The necessity for this is evident when one considers how seldom any word appears in the popular press in any way critical of the skill and competence of doctors Such, of course, never appears at all in the medical press, and there appears to be a tradition among newspaper and other editors that the subject is taboo, only men like Shaw stood any chance of making their views known at all, because Shaw was news whatever he said

Why the medical profession should enjoy such immunity is hard to understand, as it is essentially a public service and all public services must be open to critical analysis and review if they are to function efficiently This is surely a fundamental of democracy, and the fact that the medical profession is so undemocratic in itself should not be allowed to interfere with this process The lack of such frank comment in the past accounts in some part for the astonishingly poor historical record of the medical profession, a record which shows again and again that doctors, whether organised or not, have consistently obstructed progress throughout the ages, and were rarely in the van of social or medical reform The persecution suffered by Lister and Simpson among others comes to mind as a notable example, and the opposition in more recent years to the establishment of the Ministry of Health and other progressive measures is in keeping with this tradition

In short, then, we need some person or persons to keep us on our mettle, to expose deficiencies in medical practice and custom, to shake us out of the stagnant lethargy which will otherwise inevitably be our lot Shaw, while in many ways falling short of the ideal, was a stimulating man to have around, as was Chadwick, who also scorned the doctors, before him I suggest that some worthy successor to these two stalwarts be cordially invited to fill the vacant position

ADAIR GIBBS
London N 4

REGISTRARS

SIR,—The threatened cut in hospital registrar establishment seems to me inevitable, but I disagree seriously with its suddenness A reduction of 50% in this group immediately—or possibly spread in a limited way over two years by retention in temporary gradings—is bound to cause serious unemployment and dissatisfaction Unless this change is accompanied by a good deal of reorganisation, which it would seem impossible to institute overnight, the efficiency of many hospitals must be impaired There is much truth in the suggestion that registrars do the work of hospitals

The situation at my own hospital will serve as an illustration The present staff for 450 acute and 300 chronic patients (the latter, I believe, seriously under doctored and undernursed) is

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in branches such as radiodiagnosis, psychiatry, and tuberculosis than in general or orthopædic surgery The Ministry, in its announcement published in the same issue, states that senior registrars should be appointed for a fourth year but rarely, and then mainly in such branches as neurosurgery and thoracic and plastic surgery Referring to the Scottish survey you state "These difficulties will no doubt be acknowledged in settling the distribution of registrarships within the new total establishment"

Perhaps I misapprehend, Sir, but that could mean that you favour giving a larger number of senior registrarships, pro rata, to these narrower specialties than to the basic crafts of, say, general medicine and surgery With all deference to my friends in such branches, has not this tendency gone far enough? We already have a position in which, in all save pay, the status of the senior surgeon of a hospital is no more than equivalent to that of a junior member of a non clinical specialty who happens to have been awarded consultant rank Must expediency drive the authorities to give the plum registrarships to admittedly important, but smaller and less popular, specialties—to the detriment of the traditional status and wide sphere of usefulness of the general physician and surgeon?

My second point is of even more fundamental importance We are told

(a) As soon as possible the number of registrars is to be drastically reduced Where necessary, they are to be replaced by part time clinical assistants recruited from general practitioners "normally with higher qualifications and experience as senior registrar or registrar" Fair enough

(b) At the end of his term of appointment the unfortunate registrar or senior registrar is to be ruthlessly dismissed, to make way for another—younger, cheaper, and equally expendable

Cannot the Ministry see that this in no way solves the registrar problem? More and more trainee specialists will go through the mill and topple over into general practice At the all-too rare interviews for consultantship the same old faces will be seen, many now in general practice and holding clinical assistantships in their specialty Constantly new faces will be appearing The once keen and proficient young man will, about the age of forty, cease to be short listed and will become a disgruntled and therefore probably inefficient G.P And one can see no relief from this position

No, Sir The answer is simple Subject to the individual hospitals' discretion, the periods of tenure of the surviving registrarships should be lengthened, on a year to year basis, instead of being rigidly curtailed We cannot all be consultants It is fairest that the major disappointment should be shared among the younger doctors who are not yet deeply rooted in their specialty The most brilliant and tenacious among them could still make the grade But the pressure from below would slacken, and gradually a fair and reasonable proportion of the present generation of registrars would be absorbed into the ranks of the consultants

E G HARDY
First Assistant, Department of Surgery
Norfolk and Norwich Hospital

SIR,—Your leading article last week is entirely inadequate as an analysis of the situation created by the cynical document from Whitehall which has been misnamed by its authors a memorandum on appointments to registrar grades

This so called memorandum is not related to reality, and carries a degree of cynicism in paragraph 12 which is an insult to the profession The only proper action for the profession is to repudiate this irresponsible document, to remind the Minister that such lapses from moral sensibility will be treated with the contempt they deserve, and to place before the regional hospital boards a strong statement to this effect, coupled with constructive proposals for dealing with the situation This course of action was unanimously endorsed at a recent meeting of the consultants and senior administrative personnel of the Archway group hospitals (whose membership comprises the staff of the Whittington Hospital, New End Hospital, and others), and we write to ask that you assist in making this energetic réspons to the Ministry's administrative lapse as widely known as possible

Integrity and decency are still very much alive in our profession, and the only course that can be adopted by a profession conscious of its values and its dignity is to repudiate this offensive memorandum in its entirety, whilst signifying our desire to render to the regional hospital boards all possible assistance in solving an administrative problem which undoubtedly exists, which is not new, will take one or two years to solve, and requires thoughtful and considered action by the whole profession It is not to be solved by the issue of dictatorial and ill briefed circulars from Whitehall

T ST M NORRIS
H E S PEARSON
J M ALSTON
A F MOHUN
CECIL D COYLE
Whittington Hospital
London N 19

SIR,—I have just compared your editorials of the past two weeks with your footnote to a letter of mine published on April 2, 1949, in which you say "Many more specialists are needed and it would therefore be a misfortune if financial cuts reduced the number of trainees"

I should like to make the following observations

1 For years past even the best-informed authorities, you included, have been encouraging us to pursue our training as registrars, in anticipation of additional openings under a developing State service

2 This has led to a situation where there are numerous men who have held higher qualifications for many years, and who have been carrying out responsible work without supervision This experience will now be utterly wasted, for it is evident that, with the limitation of the number of consultant appointments, the surplus of senior registrars cannot be absorbed by the posts hinted at outside the State service

3 If these men are to be sacked during the coming summer, does the Ministry and its medical advisors expect them to make a fresh start as assistants in general practice, in competition with their newly qualified pupils—but, alas, without the latter's recent training in midwifery, dermatology, and psychiatry? Ten years' specialisation does not make a good recruit for general practice In any case, has the attitude of the local executive councils as to vacancies in general practice or of the principals as to assistantships, been fully explored? Here let me briefly inform you of what the chairman of a local executive council in the North East of Scotland said at a meeting of that body This statement was published last week in the *Aberdeen Press and Journal* in question and answer form

"*Question* Was experience in general practice a good thing in these applications [for a large rural practice]?

Answer We had an enormous number of applications from doctors who work in hospitals—well qualified men of the registrar class But the committee considered that type of candidate was not the type who should get a practice of this size It was too big a plum"

As to principals, will they accept a man of, say, 38 with an F R C S? The two I know, when asked, said candidly that they would not dream of it

4 What machinery is envisaged for senior registrars to find their way back to hospitals as "general practitioner part-time clinical assistants" (G.P P T C A.), and what would be their precise function?

5 The Ministry statement establishes that the training period for consultants should be five years This, compared with the years of devoted and under paid apprenticeship

that many of us older men and women have served, seems a little inadequate

Finally, may I say that the problem has been treated without the least regard for the human beings involved? Surely this type of statistical approach, without an appreciation of individual capacities and qualities, can only lead to unhappiness and discontent

SENIOR REGISTRAR

*** Our correspondent's earlier letter was written shortly before the reviewing committees were due to complete their studies of hospital medical establishments, and the footnote to which he alludes was amplified in a leading article (May 14, 1949) in which we asked whether it was sensible "to allow these trainees, on whom the nation's money has been spent, to scatter a few short months before the hospitals' new complement of staff is made known" In both this article and a later one (Nov 19, 1949) we drew attention to the disproportion between existing establishments of registrars and of consultants and pointed out the registrars' need for immediate information We still believe that "many more specialists are needed", but the health service is now operated within a limited total budget, and we believe that other claims may be even more pressing This aspect is discussed in a leading article on another page—ED L

SIR,—Of the many remarkable circulars issued by the Ministry of Health since the appointed day, R H B (50) 106 on registrar appointments, summarised in your issue of Nov 11, must rank as one of the most remarkable It might have been thought that in planning an establishment, the volume of work to be accomplished and the needs of patients were factors to be taken into account, apparently, however, these factors must be given low priority The army must not be allowed to expand, for otherwise there will be too many privates without prospect of attaining high rank The winning of wars is a minor consideration!

Croydon. T W PRESTON

SIR,—The decision of the Minister of Health drastically to reduce the establishment of registrars, and particularly senior registrars, can only be termed short sighted and retrograde Apart from the short term result that more consultants must be appointed or the service to the patient suffer, this policy will lead to a serious reduction in the standards of service in the more distant future

As the new distribution stands, there will be only one registrar trained for each consultant vacancy, and there is no guarantee that the registrar will have been trained in the right specialty when the vacancy occurs Secondly, the new scheme does not allow for a margin of wastage in the ranks of the senior registrars themselves The Ministry circular also points out the need for specialists in the Services, in the Colonies, and in other overseas appointments, but at the same time it cuts out completely the provision of training posts for men who might enter these spheres The net result is that ultimately the average number of applications from senior registrars for consultant appointments will be considerably less than unity

But the most serious result of all will be the elimination of the element of competition for consultant appointments This must progressively lower the standard of our consultant service The antedating of the competitive stage to the selection of senior registrars (and that itself only in part) cannot suffice, as many men emerge from mediocrity during the period of responsibility and experience provided by a senior registrar appointment, while in others weaknesses become apparent In the Services, there must be a large pool of officers of the rank of commander, lieut colonel and wing commander from which future officers of flag, field, and air rank may be recruited The wastage on retirement at commander and equivalent rank is tremendous but is accepted as quite inevitable No one would suggest that the number of lieut colonels be restricted to the number of vacancies in the post of colonel or major general! The trained registrars must be kept up in numbers, not only to help with the work of the National Health Service, but in order to provide an adequate pool from which the best may be promoted to consultant rank We cannot have the "pick of the bunch" unless there is a bunch to pick from

The decision was probably made partly as a result of Treasury pressure, but also probably partly as a result of the registrars' own views I do not believe, however, that their hardship and insecurity will be as serious as they have made out, and certainly no worse than that normally faced by registrars and chief assistants in pre war days

May we hope that your influence will be brought to bear to cause a reversal of this new, and I believe retrograde, policy

Canterbury F G ST CLAIR STRANGE.

SIR,—The question of distinction awards, about which there has lately been much publicity, should be studied in the light of the economies now contemplated in relation to registrar establishments, for the displacement of 1000 registrars with an average income of £1000 per annum will provide the sum allocated for distinction awards

The time has come for our leaders to say whether they are willing to see the younger generation crushed through mis planning, or whether, even at this late hour, the present establishment should be left undisturbed so that the men and women affected can find alternative employment without being subjected to the grave anxiety of finding a post in the short time remaining to them Does not the Hippocratic oath speak of the sharing of livelihoods between pupil and teacher as between father and son? We look forward to a lively correspondence by our elders comparable to that which we have seen from them concerning their distinction awards, so that it may not be said today that the distinction awards of yesterday will be followed by the extinction awards of tomorrow REGISTRAR.

SIR,—The imminent reduction in the registrar establishment prompts us to make the following observations, for we believe that this action, said to be in the interests of the registrar class, is, in fact, contrary to their wishes

1 *Registrars are prepared for each to be in open competition with his fellows* believing this to be the most certain method of determining the individual best suited for selection to consultant status He is willing to accept the risk that no consultant post may be available for him on completion of his registrar appointments, but believes that the better doctor he can become before entering either general practice or some special branch of the service, the better for the future efficiency of the service

2 *The decision as to who will become consultants will in future be made too soon after qualification*—i e, before there has been adequate time for all round experience to be gained or assessment of his capabilities to be made

3 *The registrar is at present vital in a service which deals not only with the training of consultants, but also with the treatment of patients* The long term consultant establishment problem may be solved by a 40% reduction in the hospital registrars, but this will be accompanied by a reduction in the efficiency of the service A great deal of the large volume of work at present being done by registrars will, in future, have to be done by senior house officers, who are not qualified to do it If they are sufficiently qualified they should receive the salary of a registrar

in branches such as radiodiagnosis, psychiatry, and tuberculosis than in general or orthopædic surgery The Ministry, in its announcement published in the same issue, states that senior registrars should be appointed for a fourth year but rarely, and then mainly in such branches as neurosurgery and thoracic and plastic surgery Referring to the Scottish survey you state 'These difficulties will no doubt be acknowledged in settling the distribution of registrarships within the new total establishment"

Perhaps I misapprehend, Sir, but that could mean that you favour giving a larger number of senior registrarships, pro rata, to these narrower specialties than to the basic crafts of, say, general medicine and surgery With all deference to my friends in such branches, has not this tendency gone far enough? We already have a position in which, in all save pay, the status of the senior surgeon of a hospital is no more than equivalent to that of a junior member of a non clinical specialty who happens to have been awarded consultant rank Must expediency drive the authorities to give the plum registrarships to admittedly important, but smaller and less popular, specialties—to the detriment of the traditional status and wide sphere of usefulness of the general physician and surgeon?

My second point is of even more fundamental importance We are told

(a) As soon as possible the number of registrars is to be drastically reduced Where necessary, they are to be replaced, by part time clinical assistants recruited from general practitioners 'normally with higher qualifications and experience as senior registrar or registrar" Fair enough

(b) At the end of his term of appointment the unfortunate registrar or senior registrar is to be ruthlessly dismissed, to make way for another—younger, cheaper, and equally expendable

Cannot the Ministry see that this in no way solves the registrar problem? More and more trainee specialists will go through the mill and topple over into general practice At the all too rare interviews for consultantship the same old faces will be seen, many now in general practice and holding clinical assistantships in their specialty Constantly new faces will be appearing The once keen and proficient young man will, about the age of forty, cease to be short listed and will become a disgruntled and therefore probably inefficient G P And one can see no relief from this position

No, Sir The answer is simple Subject to the individual hospitals' discretion, the periods of tenure of the surviving registrarships should be lengthened, on a year to-year basis, instead of being rigidly curtailed We cannot all be consultants It is fairest that the major disappointment should be shared among the younger doctors who are not yet deeply rooted in their specialty The most brilliant and tenacious among them could still make the grade But the pressure from below would slacken, and gradually a fair and reasonable proportion of the present generation of registrars would be absorbed into the ranks of the consultants

E G HARDY
First Assistant, Department of Surgery
Norfolk and Norwich Hospital

SIR,—Your leading article last week is entirely inadequate as an analysis of the situation created by the cynical document from Whitehall which has been misnamed by its authors a memorandum on appointments to registrar grades

This so called memorandum is not related to reality, and carries a degree of cynicism in paragraph 12 which is an insult to the profession The only proper action for the profession is to repudiate this irresponsible document, to remind the Minister that such lapses from moral sensibility will be treated with the contempt they deserve, and to place before the regional hospital boards a strong statement to this effect, coupled with constructive proposals for dealing with the situation This course of action was unanimously endorsed at a recent meeting of the consultants and senior administrative personnel of the Archway group hospitals (whose membership comprises the staff of the Whittington Hospital, New End Hospital, and others), and we write to ask that you assist in making this energetic résponse to the Ministry's administrative lapse as widely known as possible

Integrity and decency are still very much alive in our profession, and the only course that can be adopted by a profession conscious of its values and its dignity is to repudiate this offensive memorandum in its entirety, whilst signifying our desire to render to the regional hospital boards all possible assistance in solving an administrative problem which undoubtedly exists, which is not new, will take one or two years to solve, and requires thoughtful and considered action by the whole profession It is not to be solved by the issue of dictatorial and ill briefed circulars from Whitehall

T ST M NORRIS
H E S PEARSON
J M ALSTON
A F MOHUN
CECIL D COYLE
Whittington Hospital
London N 19

SIR,—I have just compared your editorials of the past two weeks with your footnote to a letter of mine published on April 2, 1949, in which you say "Many more specialists are needed and it would therefore be a misfortune if financial cuts reduced the number of trainees"

I should like to make the following observations

1 For years past even the best-informed authorities you included, have been encouraging us to pursue our training as registrars, in anticipation of additional openings under a developing State service

2 This has led to a situation where there are numerous men who have held higher qualifications for many years, and who have been carrying out responsible work without supervision This experience will now be utterly wasted, for it is evident that, with the limitation of the number of consultant appointments, the surplus of senior registrars cannot be absorbed by the posts hinted at outside the State service

3 If these men are to be sacked during the coming summer, does the Ministry and its medical advisors expect them to make a fresh start as assistants in general practice, in competition with their newly qualified pupils—but, alas, without the latter's recent training in midwifery, dermatology, and psychiatry? Ten years' specialisation does not make a good recruit for general practice In any case, has the attitude of the local executive councils as to vacancies in general practice, or of the principals as to assistantships, been fully explored? Here let me briefly inform you of what the chairman of a local executive council in the North East of Scotland said at a meeting of that body This statement was published last week in the *Aberdeen Press and Journal* in question and answer form

"*Question* Was experience in general practice a good thing in these applications [for a large rural practice]?

Answer We had an enormous number of applications from doctors who work in hospitals—well qualified men of the registrar class But the committee considered that type of candidate was not the type who should get a practice of this size It was too big a plum"

As to principals, will they accept a man of, say, 38 with an F R C S? The two I know, when asked, said candidly that they would not dream of it

4 What machinery is envisaged for senior registrars to find their way back to hospitals as "general practitioner part-time clinical assistants" (G.P.P T C A), and what would be their precise function?

5 The Ministry statement establishes that the training period for consultants should be five years This, compared with the years of devoted and under paid apprenticeship

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Gureba Hospital Istanbul JENNY FRANCO
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ST PAUL'S CRAY APPOINTMENTS

SIR,—Considerable publicity has been given to Miss Hornsby Smith's statement in the House of Commons alleging that the L C C had "appointed" us to a practice on the St Paul s Cray Estate, and that in doing so had shown us favouritism for political reasons

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We feel quite able to defend ourselves against this remarkable attack, but the unprecedented event of doctors being attacked by name in the House of Commons and their right to their professional positions being questioned solely because of their alleged political views, should evoke an unequivocal reply from the whole profession

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Obituary

NEIL FREDERICK SINCLAIR

F R C S

Mr Neil Sinclair, surgeon to the West London Hospital, died at his home on Nov 14

He was born in Jamaica in 1885, the son of Dr F A Sinclair When he arrived in this country fifty years ago, to complete his education, he had few friends and little money As with so many of the best, his student and early professional life were a struggle In retrospect he considered this salutary, but there was a note of regret for no one would have enjoyed university life more than he Yet there remained that great attribute, he was a perpetual student The London Hospital early became and remained his alma mater To him it was school college, and university, and he was filled with admiration for it and its great men He was proud that his son is now a student there

[Thomas Fall

After qualifying in 1908 he held house-appointments at the London till 1912 He served with the R A M C in France during the 1914–18 war, and on his return he took his Edinburgh and English surgical fellowships He went to the West London Hospital as surgical registrar, and he was appointed assistant surgeon in 1919 He quickly built up a busy consulting practice, and he was also on the staff of Chiswick, Northwood Brentford, and many small hospitals In 1933 he was appointed surgeon to King George Hospital, Ilford

The founding of the West London Hospital Medical School gave Sinclair the opportunity for teaching which he welcomed, and his wealth of experience and anecdote made his ward rounds the events of the week His paternal instincts warmed to his registrars and house-surgeons, and he was a kindly but discriminating patron of younger surgeons His teaching was conversational, he avoided the lecture-room and preferred to teach at the bedside, in the outpatient department, or in the museum, by gentle control of question and answer, as he had learnt so he taught He was in fact a great teacher and his experience and ability were rewarded by his appointment to the court of examiners of the Royal College of Surgeons

A colleague writes "Many practitioners relied on Sinclair, and the large number of his doctor patients was a measure of their confidence It is true they were often kept waiting for his unhurried arrival but this unpunctuality was essential, almost physiological, in maintaining his health and good spirits, and prevented any tendency to haste in examination of patients, curtness to relatives, or operating against the clock His whole day was theirs, and his working day was a long one

"Technically his surgery was excellent and a joy to watch, in action quick, yet free from haste, easy, neat, and rhythmical. He liked his instruments to be light and simple, and avoided the 'mechanical' especially among the retractors By deftness and dexterity he accomplished his high reputation as an operator It was in the surgery of the thyroid and the upper abdomen that he was a master by his gentleness shock was prevented and after-treatment minimised

"We shall remember him as the most friendly robust figure, never pompous, but fiercely jealous of the independence a clinician must command That he disapproved of many of the changes time have brought is no secret, for his contacts with his colleagues and patients were personal and intimate, and anything that savoured of direction or remote control offended his independent spirit Dividing as he did, his time between that of his colleagues in hospital and in general practice, no wide gap could develop between them, and, to the

We consider that it is against the democratic traditions of this country that an irrevocable decision affecting a large segment of the medical profession should be made without any reference to their views on the subject We would suggest, therefore, that hospital residents and registrars throughout the country should meet to decide their attitude to this proposed change and that the Minister should thereafter take a referendum of their views

Twenty five Registrars and Resident Medical Officers, St Luke's Hospital, Bradford

THE PRACTITIONER'S REMUNERATION

SIR,—Your well balanced annotation last week on the proposals of my organisation for a new basis of pay for general practitioners hits the essential nails squarely on the head

Rightly or wrongly, the Negotiating Body pursued the original general practitioner claims on the basis of a global sum to be divided subsequently as the profession saw fit This method (which must be unique) has an advantage and a disadvantage—an advantage in that it leaves the distribution of individual doctors' pay to their colleagues, a disadvantage in that the Negotiating Body (G.M S C or Whitley Council) cannot now sue for more money on behalf of an underpaid section as can other bodies of workers

The argument has resolved itself into one about "betterment" Have the Spens Committee recommendations been sufficiently adjusted to keep pace with the rise in the cost of living since 1938? Of course they have not All sensible men know this and any economist would confirm it But is it likely that the Government, in considering the wage claims of any group, will agree to make large scale adjustments dependent on continuous changes in the cost of living? Cabinet Ministers would want £8500 a year instead of the present £5000, M P s £1700 instead of £1000, and so on down to the humblest private in the Army No doubt the G M S C have an unanswerable case for at least 70%—probably now nearer 90%—increase The only trouble is that the case will not be answered The negotiations will be spun out indefinitely (2½ years have already passed and the issues are as confused as ever)

You say that the G M S C is so sure of the soundness of its case that it does not fear arbitration The claim is for at least £23 million (including retrospective payment) on behalf of a group whose average *net* income is not less than £30 per week I beg leave to doubt whether an arbitration tribunal would grant this claim, and doubting this there is surely a strong case for instituting a claim for the lower paid sections of the profession

The other important issue is how any extra money should be distributed (whether it is £5 million or £7 million is immaterial) "Redistribution is within the power of the profession itself," you say Yes, this is indeed true, but it is worth examining the machinery by which the profession exercises these powers The Annual Conference, which determines policy, derives its power from the democratically elected local medical committees, but how do the latter settle matters of policy? The local representatives are not elected because of any special views they hold, but because they are respected individuals who will guard the practitioners' local interests (the L M C is a statutory body set up for a *local* purpose) I am not sure whether these committees can decide national policy unless they know the views of the doctors who elected them But there is no doubt that it is in these committees that such matters should be thrashed out, and it is there that we want the M P U's scheme discussed If it is a bad scheme it will get no further If it is a good one it will be carried to the Annual Conference and perhaps be adopted as official policy That is all we ask In our view this discussion should take place before money is available—not after

One last point You ask "Would the M P U council still recommend their new system of remuneration if the Treasury refused to add to the central fund?" I cannot commit my council, but I feel it would answer that this is for the profession to decide The scheme proposed is not a rigid one, it could be modified in a number of ways Whether it is modified or rejected, it will have served one purpose if it stimulates discussion The isolated overworked practitioner has neither the time nor the available data to draw up proposals of this kind Some central body has to do this for him We know that our scheme will not please everyone, but it has already elicited a very large number of interesting and important suggestions, as well as much uncritical support

Medical Practitioner's Union
55 Russell Square
London W C 1

BRUCE CARDEW
General Secretary

MEDICAL EDUCATION OF AFRICANS

SIR,—Since 1941 the South African government have awarded five bursaries each year to enable Africans to study medicine at the University of the Witwatersrand, Johannesburg These were recently discontinued by the present government, but, as the result of protests, the Minister of Education agreed to grant three bursaries for this year and next year only

The government state that they intend at some future date to reinstate all the bursaries when their proposed non European medical school is opened in Natal The indications are, however, that it will be at least another two years before this medical school does in fact open, with a resultant break in the training of sorely needed medical men The accommodation which is intended for the school consists of a disused army camp near Durban

The following information from the *Handbook on Race Relations in South Africa*[1] will emphasise the seriousness of the position

"The present over all ratio (of doctors) is 1 doctor to 3000 population, with variations from 1 to 400 or 500 in the largest urban centres, down to 1 to 30,000 in the more backward rural areas "

"The death rate for Europeans which is slightly less than 10 per 1000 is as low as any in the world, but for non Europeans it is 20 or over Other mortality and morbidity rates reflect similar differences between European and non European The infant mortality rate for Europeans is less than 50 per 1000 live births, for natives it is not less than 150 anywhere and in some areas as high as 600 or 700 The maternal mortality rates, of 4 to 5 per 1000 births for non Europeans, is twice as high as for Europeans "

"The incidence of tuberculosis is so high and is rising so rapidly among non Europeans that it constitutes probably the gravest health problem in the Union today"

South African students, anxious for the future health of the African community and fearing an indirect attack on the university's great tradition of non segregation, are determined to replace the bursaries which have been removed, and, if possible, to supplement them further

The students of the Witwatersrand have agreed voluntarily to levy an extra 10s per annum on their fees towards the trust fund which has been set up with the approval of the university authorities By itself this levy will not be adequate to replace the bursaries, and a public appeal has been launched to obtain donations to supplement the fund

Each bursary consists of £250 per year for six years and takes the form of a loan, interest free and repayable over a term of years Thus, once the fund is firmly established it will eventually become self supporting

1 Published for the South African Institute of Race Relations by the Oxford University Press Cape Town and London 1949

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One last point You ask "Would the M P U council still recommend their new system of remuneration if the Treasury refused to add to the central fund?" I cannot commit my council, but I feel it would answer that this is for the profession to decide The scheme proposed is not a rigid one, it could be modified in a number of ways Whether it is modified or rejected, it will have served one purpose if it stimulates discussion The isolated overworked practitioner has neither the time nor the available data to draw up proposals of this kind Some central body has to do this for him We know that our scheme will not please everyone, but it has already elicited a very large number of interesting and important suggestions, as well as much uncritical support

Medical Practitioner's Union,
55 Russell Square
London W C 1

BRUCE CARDEW
General Secretary

MEDICAL EDUCATION OF AFRICANS

SIR,—Since 1941 the South African government have awarded five bursaries each year to enable Africans to study medicine at the University of the Witwatersrand, Johannesburg These were recently discontinued by the present government, but, as the result of protests, the Minister of Education agreed to grant three bursaries for this year and next year only

The government state that they intend at some future date to reinstate all the bursaries when their proposed non European medical school is opened in Natal The indications are, however, that it will be at least another two years before this medical school does in fact open, with a resultant break in the training of sorely needed medical men The accommodation which is intended for the school consists of a disused army camp near Durban

The following information from the *Handbook on Race Relations in South Africa*[1] will emphasise the seriousness of the position

> 'The present over all ratio (of doctors) is 1 doctor to 3000 population, with variations from 1 to 400 or 500 in the largest urban centres, down to 1 to 30,000 in the more backward rural areas "
>
> "The death rate for Europeans which is slightly less than 10 per 1000 is as low as any in the world, but for non Europeans it is 20 or over Other mortality and morbidity rates reflect similar differences between European and non European The infant mortality rate for Europeans is less than 50 per 1000 live births, for natives it is not less than 150 anywhere and in some areas as high as 600 or 700 The maternal mortality rates, of 4 to 5 per 1000 births for non Europeans, is twice as high as for Europeans "
>
> 'The incidence of tuberculosis is so high and is rising so rapidly among non Europeans that it constitutes probably the gravest health problem in the Union today"

South African students, anxious for the future health of the African community and fearing an indirect attack on the university's great tradition of non segregation, are determined to replace the bursaries which have been removed, and, if possible, to supplement them further

> The students of the Witwatersrand have agreed voluntarily to levy an extra 10s per annum on their fees towards the trust fund which has been set up with the approval of the university authorities By itself this levy will not be adequate to replace the bursaries, and a public appeal has been launched to obtain donations to supplement the fund
>
> Each bursary consists of £250 per year for six years and takes the form of a loan, interest-free and repayable over a term of years Thus, once the fund is firmly established it will eventually become self supporting

1 Published for the South African Institute of Race Relations by the Oxford University Press Cape Town and London, 1949

Soon after the war he was due to retire, and he was in doubt what life still had in store, when John Ryle invited him to work on industrial lung diseases at the Oxford Institute of Social Medicine The statistical approach to pathology was novel to him, and the word 'significant' took on a new meaning as he began to classify his records of over 1000 microscopical examinations of lungs He found Oxford a pleasant place to work in nothing taken for granted and human qualities respected more than elsewhere As time went on retirement seemed to him another word for getting busier, and he had lately completed the life of John Hunter reviewed on p 628 In 1948 he was awarded the Weber-Parkes prize of the Royal College of Physicians

Of his continuing and varied appreciation of life, H W relates

'When a man who for over ten years has had recurrent pyrexias loses in one night his unique collection of pathological specimens, he might well be soured But Gloyne's interests never flagged, they seemed sharpened by adversity, the subjects over which his mind ranged widened rather than narrowed. His tenacity of purpose he may have inherited from his Yorkshire forbears, the way in which it was softened by humour and intuition was his own His views were seldom expressed with Johnsonian bluntness yet there were few subjects on which he could not talk It was typical that his most intimate friend was a professor of Byzantine history He read and re read the English classics, not discursively but one author at a time, from beginning to end It was as essential to read *Evan Harrington* as to learn all he could from the trials of *Richard Feverel* His holidays were spent studying the ancient abbeys and he delighted his friends as well as himself by walking them through the Buckinghamshire he knew so intimately, or showing his sympathetic understanding of lord and peasant as he illustrated social history from the top of Bredon Hill '

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WILLIAM GLEN LISTON

C I.E, M D GLASG, F R C P E, F R.S E, D P H

Lieut Colonel Glen Liston, who died at his home at Morar, Inverness-shire, on Oct 18, was a former director of the Bombay Bacteriological Laboratory at Parel. He will also be remembered for his work as a member of the Plague Research Commission of 1911

Born in 1873 at Secunderabad, where his father was stationed as an Army chaplain, he was educated at George Watson's College, Edinburgh, and at the Albany Academy, Glasgow In 1897 he graduated M B at Glasgow University and in the following year he entered the Indian Medical Service During his training course at Netley one of his teachers was Almroth Wright, then professor of pathology at the Army Medical School, and soon after Liston arrived in India in 1893 he was sent to help Wright in the work of the Indian Plague Commission In 1899 he was transferred to military duties at Ellichpur, in Berar, where he studied malaria, and particularly anopheles mosquitoes, and took part in relief work in the famine of 1899–1900

In the next year he joined the plague laboratory at Bombay under Haffkine, but he continued his studies on mosquitoes and with the help of Dr Turkhud prepared detailed drawings of the anopheles found in Berar and Bombay S P James, who was attached to the Royal Society's commission for the study of malaria, was struck with these, he suggested that they should produce a joint work using the drawings prepared by Turkhud and the result was their beautifully illustrated monograph on Indian anopheles

In their report in 1901 the Royal Commission on Plague virtually rejected L F Simond's hypothesis that plague was spread by fleas from plague-infected rats (*Ann Inst Past* October, 1898) But the idea gripped Liston He at once began studying fleas as he had mosquitoes, and at Netley, where he had lately been appointed to the staff, Almroth Wright gave him every help On his return to India in 1902 he was posted to the laboratory at Bombay, under Haffkine and Bannerman, and for two years Liston and Bannerman gathered and sifted evidence of the relation of rats and fleas to plague in man—under considerable difficulties, for Haffkine was failing in health and was subject to curious obsessions which hindered research An accidental contamination of one phial of the plague vaccine with tetanus, which had happened when Liston was away at Netley, had cast a shadow over the laboratory The Government of India sought to put matters right by sending Bannerman to Madras, and Liston, much crestfallen and despondent, to Sambalpur as civil surgeon A few months later both were recalled to the laboratory, and Haffkine was appointed to a special laboratory in Calcutta Liston's first duty was to reorganise the preparation of the plague vaccine Maynard's method of bottling was introduced, and the whole procedure, with rigid tests for purity and sterility at every step, was so good that it remained unchanged for the next 25 years

His important paper on Plague, Rats, and Fleas in the *Indian Medical Gazette* in 1905, which confirmed that "rats are the most important factor in the spread of plague," and gave many observations, his own and others, supporting the view that rat fleas convey plague from rat to rat, from rat to man, and from man to rat, aroused fresh interest in his work The Secretary of State consulted the Royal Society and the Lister Institute, an advisory committee at home and a working commission in India were set up, and Liston's services were placed at the committee's disposal. When the commission reported, Major George Lamb, the director, pointed out that its work was a coping stone to careful and tedious investigations already carried out in India and elsewhere rather than an original building In 1907, the commission was temporarily dissolved, Bannerman was promoted surgeon-general and moved to Madras, and Liston became director of the Bombay Bacteriological laboratory Here every member of his staff could be sure of a patient hearing, encouragement, kindly criticism, and valuable suggestions The laboratory was several miles from the centre of Bombay, but Liston hardly ever missed a daily visit to one or other of the three large hospitals, and many of the Indian practitioners took their problems to his laboratory

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During the 1914–18 war he had a distinguished military record For his services as officer in charge of No 3 casualty clearing station and as senior medical officer at Amiens he was appointed D S O in 1917 and mentioned in despatches Later with the rank of colonel he became A.D.M.S 47th (2nd London) Division of the Territorial Army

After he was demobilised Dr Ray settled in London. "In the early twenties," writes C B H, 'Ray worked with the late Dr Fortescue Fox to secure for London a treatment centre in rheumatism and arthritis that would

patient's benefit, there resulted that essential, continuity of treatment Very many will have read of his death with sorrow Not only was he from so many aspects, the ideal practical surgeon, but he had so many friends and acquaintances in the profession that the directory seemed only required to confirm his information "

STEPHEN ROODHOUSE GLOYNE

M D LEEDS, D P H

Dr Gloyne, who died on Sept 25, aged nearly 68, was a Yorkshireman—stocky, matter of fact, sociable—who made his mark in London as a student and interpreter of respiratory disease Though he was born at Peckham his parents soon returned to Yorkshire, and he went to school at Wakefield and studied medicine at the Yorkshire College before entering the Middlesex Hospital, where he worked for a year or two in the pathology department after qualification In 1906 he took the first M B degree granted by the new University of Leeds, and in 1909 he proceeded to the degree of M D Meanwhile he had returned to London, taking appointments as assistant school medical officer to the L C C and later to the East Sussex county council

In 1911 he moved northwards to Victoria Park, where, as pathologist to the London Chest Hospital, he worked till 1948 During these years he attained without conscious effort a unique place in the life of the hospital It was difficult to think of Victoria Park without also thinking of Gloyne His laboratory became a museum and reference library, the rendezvous of the clinical staff, and a centre for teaching and research Letters from his friends give a vivid picture of his qualities as a counsellor and a friend

J I writes 'When Gloyne took up his appointment at Victoria Park the department was one room to the right of the front door of the hospital, and I do not think that any of us would have forecast the splendid department that developed from that modest beginning Nor would we have expected Gloyne to have been the man to effect that development He was no thruster, and at that time we little realised the force that lay beneath his quiet unassuming manner A friend of many generations of residents, he came to be considered as the one constant member of a changing staff, and it was to him we went for news of the hospital He had a very deep affection for Victoria Park Hospital and to do any service for it or for anyone connected with it gave him real pleasure He was one of those lovable men who, maintaining a very high standard for themselves, yet are very tolerant and sympathetic to the weakness of their fellows I have never known him speak unkindly of anyone In spite of his fundamental seriousness he was full of quiet humour He was a delightful companion and a staunch friend "

H W takes up the tale "During the 1914–18 war, he combined the rôles of house physician, pathologist, and consultant rolled into one modest Pooh Bah, the only regular doctor in the place What he gained in clinical acumen and intuitive understanding from that grim experience will never be known "

N. L R continues "It is in the comparatively spacious and tranquil days between the wars that those who knew Gloyne best will perhaps picture him most easily It is pleasant to be able to remember those after lunch gatherings which became a forum of debate where the most junior pitted his talents against such masters as Freddie' Chandler, Burton Wood, and V S Hodson Gloyne excelled on these occasions It mattered little whether the subject under discussion was a clinical problem, a knotty point of history, or a character from English literature, he, as like as not, from his habitual seat at the end of the sofa, would put the matter in its right perspective or when as sometimes, happened political sparks began to fly, he would, with his characteristic infectious laugh disperse us all to outpatients in the best of humours It is in this setting that we shall remember him—a scholar with wide interests, a fine pathologist and yet no mean clinician, but above all as one of the most lovable of men "

During the late war, when the hospital suffered severely at the hands of the enemy, and by the death of two senior members of its staff, Gloyne again came forward and shouldered a burden which perhaps no one else could have borne The loss in one night in 1941 of his laboratory, his museum specimens, and his new microscope he rarely mentioned Instead he turned his thoughts at once to the hospital and its responsibilities. He and his wife placed their cottage in the country at the disposal of the matron as a rest centre for the nurses, and he played a prominent part in opening the country branch at Camberley He was also an E M S pathologist at St Margaret's Hospital, Epping

Among his colleagues in other specialties which marched with his own Gloyne made an equally lasting impression Of his work outside Victoria Park E L C reports

'Two things were near to the heart of Gloyne and to both he gave of his best—and his best was good indeed One was the journal, *Tubercle* He superintended it from its inception and thereafter steered it through many perilous passages And the more perilous the passage, the more, under his direction, did the journal emerge with enhanced status The second was his interest in pulmonary diseases due to dust He was among the first to recognise the unexpected toxicity of asbestos dust at a time when others were only prepared to accept silica dust as harmful His studies will always be regarded as opening the door to the disease entity known as asbestosis He approached it especially from the clinical and histological aspects without relying too much on X ray shadows He told of what he had observed and his observations were always confirmed by others '

N H S, a fellow pathologist, writes 'For a great many years he was the only pathologist of any authority connected with thoracic work as a specialty His investigations were practical in intent and within the range of an ordinary hospital laboratory, and his experimental work though simple in design showed that he could have done pure research just as successfully had he so chosen His output in print is no measure of his learning But his writing was concise, accurate, beautifully illustrated, and extremely valuable to those of us with the same interests

Gloyne's influence was acknowledged in the field of industrial medicine He was a part time member of the Medical Board for Silicosis and Asbestosis from 1931 till 1948, and his colleague C S writes

"Although the amount of work Gloyne did for the board was not large, the personal influence he brought made his contribution of the greatest importance His profound knowledge of the pathological processes produced by dust, and his kindly method of showing it, stimulated the interest of all his colleagues, and his work on asbestosis made him for us the acknowledged authority on this form of pneumoconiosis "

As president of the Tuberculosis Association and Thoracic Society Gloyne's prestige and popularity were enhanced by the clear sanity and common sense of his remarks

"He saw many changes in tuberculosis and chest work and recognised their worth and future value with uncanny accuracy," writes T H S 'His professional life was centred round the chest hospitals which he elected to serve in preference to higher academic posts, but his influence extended far beyond the bounds of thoracic pathology And anyone who met Stephen Gloyne more than once cannot but have been impressed by the essential goodness of the man In these days it is rare to find a man who had so many friends and admirers The active little figure, white headed almost as long as I can remember acted as adviser and father confessor to the many who approached him with their problems His counsel was kind and always helpful, though his comments were not devoid of a tinge of caustic wit—the bitter sweet that could often act as a spur or corrective

Soon after the war he was due to retire, and he was in doubt what life still had in store, when John Ryle invited him to work on industrial lung diseases at the Oxford Institute of Social Medicine The statistical approach to pathology was novel to him, and the word 'significant" took on a new meaning as he began to classify his records of over 1000 microscopical examinations of lungs He found Oxford a pleasant place to work in nothing taken for granted and human qualities respected more than elsewhere As time went on retirement seemed to him another word for getting busier, and he had lately completed the life of John Hunter reviewed on p 628 In 1948 he was awarded the Weber-Parkes prize of the Royal College of Physicians

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be a credit When these labours came to a successful end, by the formation of the British Red Cross Clinic for Rheumatism, Dr Ray was appointed the first honorary physician Thereafter for a long period he gave loyal and steadfast service that set a fine example to his medical colleagues, and was of great benefit to the staff and patients at this unit In 1948 he was appointed O B E in recognition of this service" He continued to work at the clinic till in 1948, on the introduction of the National Health Service, it was attached to the Middlesex Hospital as the Arthur Stanley Institute for Rheumatic Diseases He was also physician and director of the department of physiotherapy at the St Marylebone and Westminster General Dispensary His publications include *Rheumatism in General Practice* (1934), which gave a general survey of the disease and a review of its several manifestations in different regions of the body, and *Hydrotherapy and Climatotherapy* (1936) in which he classified and described spas at home and abroad in accordance with their main therapeutic indications His mind was both vigorous and versatile His pictures shown at exhibitions of the Medical Art Society will be remembered for their individuality, and he was an expert in cabinet making

Dr Ray is survived by his widow, Edith, daughter of the late Lord Henry Cholmondeley and widow of Captain R E Heaven He died in London on July 5 at the age of 80

AMY FLORENCE WAKLEY

THE only daughter of Thomas Henry Wakley (joint editor of THE LANCET from 1886 to 1905) and eldest grand daughter of Thomas Wakley (founder, and editor from 1823 to 1862) died at Burwash, Sussex, on Nov 14 Her father lived to be senior fellow of the Royal College of Surgeons, and she herself was in her 95th year when she died, the three generations, from the birth of Thomas Wakley in 1795, spanned between them a century and a half She was small and spirited, full of the family wit, and is said to have kept track of the large and growing company of Wakleys and of those who are connected with them Many of her kin came to her funeral service, some meeting as old friends and some as young strangers This hardy strain, deriving from Devon farmers, inherits the vitality which made Thomas Wakley an outstanding character

Births, Marriages, and Deaths

BIRTHS

CAPON—On Nov 13, at Plymouth the wife of Dr J H Capon—a son

LAURANCE—On Nov 11, in London the wife of Dr B M Laurance—a son

PAULLEY—On Nov 10 at Woodbridge, to Dr Deirdre Paulley (née Gavin Jones) wife of Dr J W Paulley—a son

PINSON—On Nov 14, in London, the wife of Dr K. D Pinson—a daughter

ROSS—On Nov 13, in London, the wife of Dr John Ross—a daughter

TAYLOR—On Nov 18 in London the wife of Mr Selwyn Taylor F R C.S—a daughter

TODD—On Nov 8 in London to Dr Olive Todd wife of Dr K. R Todd—a daughter

YOUNG—On Nov 9, at Macclesfield, the wife of Dr F R Mackinlay Young—a son

MARRIAGES

BENNETT—BALDWIN—On Nov 15 at Colwyn Bay, F J Bennett, M.B to Jessie Baldwin

DEATHS

CARLING—On Nov 15 at Alton Hants William Carling M B Camb aged 88

CLARK—On Nov 15 in Glasgow John Sawers Clark, M C M.A M.B Glasg D P H

FINSTERBUSH—On Nov 15 at Reading Edmund Finsterbush M.D Vienna

HARLEY—On Nov 13 in London Thomas William Harley, C I E M B Dubl lieut.-colonel I.M.S retd

LOW—On Nov 15 Alexander Low M.A M D LL D Aberd aged 82

SINCLAIR—On Nov 14, in London, Neil Frederick Sinclair F R C.S F R C.S.E

SMITH—On Nov 16, at Markyate Herts James Ernest Sutcliffe Smith M B Lond, aged 73

SWAFFIELD—On Nov 19 in London, Walter Henry Swaffield, M D Edin F.R C.S E

WADE—On Nov 15, at Enfield Middlesex Herbert Wade M R C.S aged 87

Notes and News

MORE BEDS FOR THE AGED SICK

THE St Pancras branch of University College Hospital has, for the last two years, devoted 120 beds to the treatment of the aged sick Experience has shown that a certain proportion of these beds become blocked by patients whose treatment is complete, but who cannot be discharged, either because they have no home to go to or because of some residual disability which requires nursing care With the help of a substantial grant from King Edward's Fund, the geriatric unit has now acquired a house in Highgate, to be known as the Thomas Barlow Home, where 30 patients will be accommodated under the supervision of the unit physicians Some may be expected to remain for very long periods, but others will be discharged when alternative arrangements can be made The precious—and costly—beds which they vacate at St Pancras will be occupied by some of the aged sick now waiting for admission whose treatment requires the facilities and resources which only a fully equipped hospital possesses

LONDON'S HOSPITALS AT A GLANCE

A NEW map of the London hospitals has been prepared by King Edward's Hospital Fund[1] to supersede the one they published in 1944, when the N H S was still no more than a twinkle in Mr Willink's eye They have had a much harder task this time, but have succeeded in presenting the large amount of complex information with the help of four colours, a fine variety of symbols, and some connecting lines The map shows the location, function, and ownership of all the hospitals in the Metropolitan Police area, how they are grouped under management committees, and the boundaries between the territories of the regional boards The hospital map proper is superimposed on an ordnance survey map printed lightly enough to avoid interfering with the essential symbols but perhaps not quite darkly enough to tell strangers where they are it might have been better to include only the river, main landmarks, and a few major roads Nevertheless the whole effect is not only clear but decorative An alphabetical index and a classified index, bound into a little booklet, are supplied as a key to the map

THE CHILD AND THE FILM

THE cinema, with its mixture of values, good, bad, and mediocre, and its large claims on the national time and attention, can be regarded either as a telescope sweeping the horizons of the world or a microscope magnifying criminal behaviour—a fount of education or a device for corrupting morals—depending on the outlook of the critic The idea that it must be largely responsible for the rise in juvenile delinquency is widely held, though mainly by those who are not regular cinema goers The Departmental Committee on Children and the Cinema,[2] which reported last May, concluded (with one dissentient) that the evidence as a whole did not "fasten on the cinema any primary share of responsibility for delinquency or moral laxity of children under 16" What secondary share it may have must be a matter of conjecture some think it instructs children in methods of crime, others that it glorifies brutality and equates success with money getting, others that trouble is caused not by the cinema but by the need to get the money to go

The committee based many of their conclusions on the results of an inquiry made by the Social Survey during 1948, and these results have just been published.[3] Though they add nothing new, they give a more detailed picture than the committee's report, and deserve study It will be remembered that the committee recommended a new classification of films to replace the current classification of "U" (for universal exhibition), "A" (for exhibition to adult audiences), and "H" (horrific films, for exhibition when no children under 16 are present) These categories are admittedly unsatisfactory, because a child can see an "A" film provided he is accompanied by an adult and in Scotland he can see "H" films too The Social Survey found that of the children who

1 From the Fund at 10 Old Jewry E C 2 post free 15s
2 H M Stationery Office Pp 107 3s and see Lancet 1950 i 916
3 Children and the Cinema By J C WARD Central Office of Information 1950 NS 131 Pp 100 10s post free Obtainable from the librarian Social Survey Montague Mansions, Crawford Street Baker Street London W 1.

had been to the cinema in the week before they were interviewed, about a third had seen only "U" films, nearly half had seen "A" films only, and about a sixth had seen some of each The departmental committee favoured four different classifications 'X" films (to include the present "H" category) from which children should be absolutely excluded, "C" films, to be shown at children s cinema exhibitions, advisory category "U," for family entertainment, and advisory category "A," preferably for adults Admission of children to the last two categories would be unrestricted

Whether these reasonable recommendations are to be put into action or not, the time has almost certainly come to review the criteria on which films are classed as suitable or unsuitable for children. In a recent programme *Captain Boycott*, a film dealing with the conquest of injustice by peaceful means, was classed as "A", while the trailer for a forthcoming "U" film showed savage fighting machine gunning, and other scenes of violence

NEW BRITISH STANDARDS

THE British Standards Institution has issued new standards for hospital bedsteads for general purposes (B S 1682/1950), and for paper boxes for pills, tablets, ointments, pastes, creams powder and crystals (B S 1679/1950)

The bedstead is of tubular steel construction and is 6 ft 6 in long by 3 ft wide with the spring mattress at 2 ft from the floor Provision is also made for bedsteads which are 6 ft 9 in or 7 ft long, together with alternative heights of 2 ft. 3 in or 2 ft 6 in The standard includes a specification for a removable lifting pole and provides for the inclusion of adjustable back rests and wheeling devices

Copies of these standards (bedsteads 2*s* 6*d*, paper boxes 1*s*) may be obtained from the institution's sales department, 24 Victoria Street, London, S W 1

University of Oxford

On Nov 18, the honorary degree of D SC was conferred on Dr Oscar Vogt, director of the Berlin Institute for Brain Research

University of Cambridge

On Nov 11 the degree of M.B was conferred on S E Birdsall.

University of Bristol

At a recent examination for part II of the D M.R D J B Fox and Zbigniew Lachowicz were successful

University of Birmingham

The title of reader in medicine has been conferred on Dr K W Donald, and of reader in surgery on Mr B N Brooke Dr M. B Conran has been appointed lecturer in bacteriology and Dr K Aterman lecturer in biophysics The following clinical lecturers have been appointed

Obstetrics—Dr Jean Hallum Dr G S Lester Dr L M Park.
Radiology—Dr J C Bishop Mr W H Bond Dr O E Smith
Dental Surgery—Dr R F Pusey B D.S

Mr J A. Stallworthy has been appointed Ingleby lecturer for 1951 Prof Edward D Churchill chief of the general surgical services, Massachusetts General Hospital, Boston, will take part in the surgical work of the teaching hospitals during the spring term

On Nov 21 a hostel, which will accommodate 12 students while they are doing their midwifery training, was opened at Dudley Road Hospital It is to be called the Hilda Lloyd Hostel

Scottish Conjoint Board

At recent examinations for licentiateship of the Royal Colleges of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow the following were successful

W St. C Bauld T L Bowden Wilfred Brabbin, Louis Brinberg, J P Capel Semon Caplan J T Davidson J W Davison, Donald Duck Ruth M. Eaton R Y Forbes, Isabel M. Forster Marshall Frieze K M. Graham J G Green A I Hutchinson J L W Johnson Anna M. M. Lepper Veronica R. E Lethbridge T J McCabe R H G McKay I T McLachlan A M Muir, Denis Murray P A O Brien Arthur Pollok, Anne McK. Rodger Bertram Schulberg Hareebrun Bunsee Singh P I Sless B D A Smith Leslie Steen I S Trotter E G C Valerio

McGill University

Dr Eric Wittkower has been appointed assistant professor of psychiatry He will take up his appointment in Montreal next March

University of London

At recent examinations the following were successful

M B, B.S—David Burman M W Cemlyn Jones P J Chapman S S Epstein D I Fryer L G Goodwin P E B Holmes, C B Ingor Willey R P V Jayewardene R S Jelliffe, *D J Jenden Neil MacDonald F W O'Grady, T H Roffe, M. K Sawday Geoffrey Walker (with honours), R G Adams D G E Alldridge J D B Andrews, Barnett Bass D A Begg Marion Berry C N Best Margaret L Beynon N P Bhandari Irene F A. Blakeney, A. G Blyth Elizabeth M Bough J L Bowen Betty B. Boxall, T L Bradbeer C J Bradfield Yvonne J Bradfield R O Brettell, J E Bridger W V Brooks D E Brown O F Brown K M. Bryant N L Bucky M. G Budden S H Burges Patricia M. Bushell, R P Butt, Gordon Canti R J A Carey S J Carne W I Carter P. J Chesterman J W Cieszynski P H Cima D A. Clements N F Cockett, R A Cocks R F Coggins, Sheila D Cooper C H Corby A H Cox Elizabeth P Cracroft A J I Dacre Mary G C A Dale R A Davidson Aldwyth H Davies J W Davies W H G Davies J G Dawe Geva B P de Winton P L C Diggory Stanley Dische F B Dobbs, Winifred B Drew B H Du Heaume W R Edwards Alison M. M. Fleming N S Galbraith O P Galpin M F Gardiner F P A Garton Angela M. Geere M. J Gilkes Derek Goldman A M. Goldstein Edwina R Goodall Helen Gordon, Roy Goulding, John Gower B P Green C R Greenacre E J Griffiths P W W Griffiths Stanley Hacking Antoinette I Hallett, C P Handforth H R Hewitt P G Higgins June R Hill R R W Hill, R F H Horn Harry Horwitz B J Hovenden J G Howard St C M. L A Hubbard E R Huehns F T Hunt Sylvia R Ingold Diana H Ireland Jones M C H Jackson Elsie S Jaikaran Brenda James G C Jenkins F G. Johnson M H F Johnson D R Jones R. J B H Jones Ann Kiln A E Kingston G W Korn E B Kraus A C K. Lawrence, D A Lawrence J J Lesser Shinmen Liu, J W McCloy D H McFerren K A McNeill I J MacQueen G W Marsh Nancy A H Marston J A M Martin Michael Mason Jennie C Maurice Jones, A R May Arnold Melinek A L Miller John Minnis, Cornelius Molloy David Montague Jackson Margaret C R Moore Doreen P Morgan P D Moyes A R Moynahan D J F Munro R W Nash B E C Nordin S F Oakenfull K J O Connor A L C Packham H J G Palmer Kathleen M Parker Mary Parsons J K. Paterson Dina Patuck D L Pedersen R D Peduzzi J R. P Pegg H F Pile J D Pollitt W E B Preston C F G Prideaux K G Prior Rebe S Rainsbury J H Reading Doreen M. Reside Mary Rhoderick, G A Roberts Margaret E. Robson Israel Rocker E H Roffey J K. Ross P W Ruggles, R H B Sacks Barbara J Salisbury J F Santer J N McM Schofield John Scorey W C Scott D I Segall, S A Seligman S J G Semple, Pauline M Seymour-Cole I M. Sharpe E M. Shipsey Isabel G Smith D P Smyly R S Somers, Theodore Spiro Vivian Stanhill Charles Steer F P Stephens P B Stewart K H Stone, L R Sweetman P K Sylvester Gwendolyn R Tapp P K. Thomas, D J G Tilley W L Timmins J A Tottle A F Tuohy C L Tutty Lilian S Underhill John Vaccaro Raymond Vickers M H Vickery F H Walker I H Wallington A V Watts T P S Watts D M Webster R H C Wells, Mary F West E J Williams J L Williams F P Willis M. L N Willoughby M A Wilson, Hellmuth Windschauer Maurice Wise M. E Y York Moore, J P W Young T M. Young

* University medal

Royal Institute of Public Health and Hygiene

On Monday Tuesday, and Wednesday Dec 11, 12, and 13, at 4 30 P M., at 28, Portland Place, London, W 1, Sir Leonard Parsons F R.S, will deliver the Harben lectures, entitled Studies on Child Health

International Course on Child Psychiatry

On Nov 12 some 30 psychiatrists, pædiatricians, and social workers from 19 countries in Europe the Middle East, and Latin America began a course on this subject in London Their programme was arranged by the British Council, with Dr Kenneth Soddy and Dr Emanuel Miller as advisers, and it forms part of a course arranged by the Centre International de l Enfance the first part of which was held in Paris

British Congress of Obstetrics and Gynæcology

At this congress, which is to be held at Leeds from July 8 to 11, 1952 the following subjects have been chosen for discussion abnormal uterine action in labour, stress incontinence of urine, the place of the pædiatrician in a maternity unit, and genital tuberculosis in the female The secretary of the congress is Mr B L Jeaffreson, 32, Park Square, Leeds, 1

Faculty of Ophthalmologists

At a meeting of the council on Oct 13, it was reported that the following committee had been recognised by the Minister of Health to deal with future admissions to the Central Professional Committee's list of ophthalmic medical practitioners The Hon. G J O Bridgeman Mr Nigel Cridland, Mr N P R Galloway, Mr J J Healy, Mr H. B Ingram, and Mr E G Mackie It was agreed to ask the faculty's representatives to propose that no ophthalmic medical practitioner should be admitted to the list unless he held a contract with a hospital, from S H.M O grade upwards, and that if he relinquished his post he should cease to be included on the list

be a credit When these labours came to a successful end, by the formation of the British Red Cross Clinic for Rheumatism, Dr Ray was appointed the first honorary physician Thereafter for a long period he gave loyal and steadfast service that set a fine example to his medical colleagues, and was of great benefit to the staff and patients at this unit In 1948 he was appointed O B E in recognition of this service" He continued to work at the clinic till in 1948, on the introduction of the National Health Service, it was attached to the Middlesex Hospital as the Arthur Stanley Institute for Rheumatic Diseases He was also physician and director of the department of physiotherapy at the St Marylebone and Westminster General Dispensary His publications include *Rheumatism in General Practice* (1934), which gave a general survey of the disease and a review of its several manifestations in different regions of the body, and *Hydrotherapy and Climatotherapy* (1936) in which he classified and described spas at home and abroad in accordance with their main therapeutic indications His mind was both vigorous and versatile His pictures shown at exhibitions of the Medical Art Society will be remembered for their individuality, and he was an expert in cabinet-making

Dr Ray is survived by his widow, Edith, daughter of the late Lord Henry Cholmondeley and widow of Captain R E Heaven He died in London on July 5 at the age of 80

AMY FLORENCE WAKLEY

THE only daughter of Thomas Henry Wakley (joint editor of THE LANCET from 1886 to 1905) and eldest grand-daughter of Thomas Wakley (founder, and editor from 1823 to 1862) died at Burwash, Sussex, on Nov 14 Her father lived to be senior fellow of the Royal College of Surgeons, and she herself was in her 95th year when she died, the three generations, from the birth of Thomas Wakley in 1795, spanned between them a century and a half She was small and spirited, full of the family wit, and is said to have kept track of the large and growing company of Wakleys and of those who are connected with them Many of her kin came to her funeral service, some meeting as old friends and some as young strangers This hardy strain, deriving from Devon farmers, inherits the vitality which made Thomas Wakley an outstanding character

Births, Marriages, and Deaths

BIRTHS

CAPON—On Nov 13 at Plymouth, the wife of Dr J H Capon—a son

LAURANCE—On Nov 11 in London, the wife of Dr B M Laurance—a son

PAULLEY—On Nov 10 at Woodbridge to Dr Deirdre Paulley (née Gavin Jones) wife of Dr J W Paulley—a son

PINSON—On Nov 14 in London the wife of Dr K D Pinson—a daughter

ROSS—On Nov 13, in London, the wife of Dr John Ross—a daughter

TAYLOR—On Nov 18 in London the wife of Mr Selwyn Taylor F R C S—a daughter

TODD—On Nov 8 in London to Dr Olive Todd, wife of Dr K R Todd—a daughter

YOUNG—On Nov 9 at Macclesfield the wife of Dr F R Mackinlay Young—a son

MARRIAGES

BENNETT—BALDWIN—On Nov 15 at Colwyn Bay F J Bennett, M B to Jessie Baldwin

DEATHS

CARLING—On Nov 15 at Alton Hants William Carling M B Camb aged 88

CLARK—On Nov 15 in Glasgow John Sawers Clark M C M A M B Glasg, D.P H

FINSTERBUSH—On Nov 15 at Reading Edmund Finsterbush M D Vienna

HARLEY—On Nov 13 in London Thomas William Harley C I E M B Dubl lieut colonel I M S retd

LOW—On Nov 15 Alexander Low M.A M D LL.D Aberd, aged 82

SINCLAIR—On Nov 14 in London, Neil Frederick Sinclair F R C S F R C S E

SMITH—On Nov 16 at Markyate Herts, James Ernest Sutcliffe Smith M B Lond, aged 73

SWAFFIELD—On Nov 19 in London, Walter Henry Swaffield M D Edin, F R C S F

WADE—On Nov 15 at Enfield Middlesex Herbert Wade M R C S aged 87

Notes and News

MORE BEDS FOR THE AGED SICK

THE St Pancras branch of University College Hospital has, for the last two years, devoted 120 beds to the treatment of the aged sick Experience has shown that a certain proportion of these beds become blocked by patients whose treatment is complete, but who cannot be discharged, either because they have no home to go to or because of some residual disability which requires nursing care With the help of a substantial grant from King Edward's Fund, the geriatric unit has now acquired a house in Highgate, to be known as the Thomas Barlow Home, where 30 patients will be accommodated under the supervision of the unit physicians Some may be expected to remain for very long periods, but others will be discharged when alternative arrangements can be made The precious—and costly—beds which they vacate at St Pancras will be occupied by some of the aged sick now waiting for admission whose treatment requires the facilities and resources which only a fully equipped hospital possesses

LONDON'S HOSPITALS AT A GLANCE

A NEW map of the London hospitals has been prepared by King Edward's Hospital Fund[1] to supersede the one they published in 1944, when the N H.S was still no more than a twinkle in Mr Willink's eye They have had a much harder task this time, but have succeeded in presenting the large amount of complex information with the help of four colours, a fine variety of symbols, and some connecting lines The map shows the location, function, and ownership of all the hospitals in the Metropolitan Police area, how they are grouped under management committees, and the boundaries between the territories of the regional boards The hospital map proper is superimposed on an ordnance survey map printed lightly enough to avoid interfering with the essential symbols but perhaps not quite darkly enough to tell strangers where they are it might have been better to include only the river, main landmarks, and a few major roads Nevertheless the whole effect is not only clear but decorative An alphabetical index and a classified index, bound into a little booklet, are supplied as a key to the map

THE CHILD AND THE FILM

THE cinema, with its mixture of values, good, bad, and mediocre, and its large claims on the national time and attention, can be regarded either as a telescope sweeping the horizons of the world or a microscope magnifying criminal behaviour—a fount of education or a device for corrupting morals—depending on the outlook of the critic The idea that it must be largely responsible for the rise in juvenile delinquency is widely held, though mainly by those who are not regular cinema goers The Departmental Committee on Children and the Cinema,[2] which reported last May, concluded (with one dissentient) that the evidence as a whole did not 'fasten on the cinema any primary share of responsibility for delinquency or moral laxity of children under 16" What secondary share it may have must be a matter of conjecture some think it instructs children in methods of crime, others that it glorifies brutality and equates success with money getting, others that trouble is caused not by the cinema but by the need to get the money to go

The committee based many of their conclusions on the results of an inquiry made by the Social Survey during 1948, and these results have just been published.[3] Though they add nothing new, they give a more detailed picture than the committee s report, and deserve study It will be remembered that the committee recommended a new classification of films to replace the current classification of "U" (for universal exhibition), "A" (for exhibition to adult audiences), and "H" (horrific films, for exhibition when no children under 16 are present) These categories are admittedly unsatisfactory, because a child can see an "A" film provided he is accompanied by an adult and in Scotland he can see "H" films too The Social Survey found that of the children who

1 From the Fund at 10 Old Jewry E C 2 post free 15s
2 H.M Stationery Office Pp 107 3s and see *Lancet*, 1950 i 916
3 *Children and the Cinema* By J C WARD Central Office of Information 1950 NS 131 Pp 100 10s post free Obtainable from the librarian Social Survey Montague Mansions, Crawford Street Baker Street London, W 1.

THE PATIENT AND HIS DISEASE *

A E CLARK-KENNEDY
M.D Camb, F.R C P

PHYSICIAN TO THE LONDON HOSPITAL AND DEAN OF THE MEDICAL SCHOOL, FELLOW OF CORPUS CHRISTI COLLEGE, CAMBRIDGE

I HAVE not made any particular contribution to medicine which I can now take the opportunity to expound as Dr William Croone would have wished I, therefore propose, although I fully realise how ill qualified I am to make the attempt, to paint in these two lectures a picture of medicine as a single undivided whole That I shall appear superficial is inevitable, too theoretical for your liking probable I shall be tedious; telling you nothing new, merely gathering up the strands and tying together the loose ends of our existing knowledge. But I am so convinced of the need for a general concept on which we can to some extent agree that I am impelled to try Without it, we run a grave risk of losing touch with one another Moreover, our vision of the whole is tending to be obscured more and more by the increasing amount of technical knowledge which we must each acquire

Body and Mind

The ordinary man, student or teacher, doctor or patient, thinks of himself (when he is not attempting to argue metaphysics) as a body and mind, the former as something which he can see and feel, the latter as something intangible and yet as something of which he is absolutely certain "I think, therefore I am" was the starting point of the Cartesian system of philosophy But what is body and what is mind? What is the relationship between them? What attitude to these problems should the doctor adopt? These questions must be answered, in so far as they can be answered, I think, at the start

Science, organised common sense, teaches that the human body is the product of the plan laid at its conception and the environment in which it develops It is often compared to a machine the design of which is the result of deliberate thought directed towards a certain end. But the design of the human body is the result of mutation and natural selection in the course of organic evolution A machine must be copied But the general design of the body is inherited. Machines are turned out to a standard pattern Bodies differ slightly, their individual details being largely determined by the chance mating of two people of opposite sex, and then, according to genetic theory, by the chance union of two gametes and the reshuffling of the genes The execution of a plan for a machine depends on deliberate action. The plan for a human body executes itself. A machine has to be actively maintained A human body, kept supplied with the necessary materials, maintains its characteristic form and function, as predestined in the plan whence it was derived, and continues to convert chemical energy into heat and the kinetic energy of movement In fact the human machine differs fundamentally from the machines of man's invention It is alive, self developing and self maintaining, self repairing and self reproducing Moreover, it maintains a system of high energy content in a world in which the general tendency is in the direction of the dissipation of energy It permits the development and maintenance of consciousness and mind.

Consciousness appears to depend in some way on the brain which is part of the body The development of the mind under the stimulus of experience seems to be conditioned by the physiological characteristics of the brain (The individual mind, therefore, like the individual body, depends to some extent on chance) According to one view consciousness and mind are both epiphenomena of matter The brain is said to make consciousness, in much the same sense that the heart circulates the blood, and the reactions of the mind are said to be determined by physicochemical changes in the brain But if all human behaviour was determined by conditioned reflexes, consciousness, which allows of pain and pleasure, and permits the development of the conscious mind which asks the question, would still remain mysterious Materialism leaves the "I think, therefore I am," the certainty of self, entirely unexplained Moreover 20th-century physics has reduced the extension of concrete objects in space and time to conceptions of the mind, while modern physiology compels the conclusion that their sensory qualities, which we unthinkingly attribute to them in their own right, are really added by the human nervous system Idealism, however, is unsatisfactory It conceives that all physical events take place in mind, which is contrary to common sense (A real world must exist, although it seems unlikely that the human mind can comprehend reality) On the other hand, dualism in its Platonic or Cartesian form is difficult to justify, for body and mind are obviously intimately related And how can two things which are entirely distinct possibly affect each other?

The only practical way out of this dilemma seems to lie in adopting a monistic conception of the body-mind relationship—in conceiving of body and mind as different aspects of one reality, like form and substance, energy and matter, which we shall never fully understand. Do we not see drugs, diseases, operations on the brain, exerting a profound effect on the mind? Alteration of the body leads to alteration of the mind That is certain, and there is also evidence, I think, that alteration of the mind due to emotional shock, long imprisonment, religious conversion, mystical experience, mental disease, and even application of the mind to a profession, may have some *direct* effect on the structure and functions of the body, although less quickly, to a less extent, and less consistently We must picture body and mind developing together from birth and being maintained together throughout life, the one reacting back upon the other Such, as I see it, is the psychosomatic nature of mankind

We cannot, however, escape from the common conception of the dualism of our nature engendered by personal conviction based on individual experience of the freedom of the human will "All theory and evidence is against the freedom of the will," said Dr Johnson, "all experience for it" Now I do not propose to argue for or against the existence of the freedom of the human will, or to discuss the nature of something in ourselves which gives us the feeling of being able to control, within limits, our own thoughts and actions Still less shall I attempt to define the level where freedom ends and determinism begins I am concerned with a practical problem, endeavouring to outline a working conception of medicine in our present state of knowledge Now it is easy to argue against free will, and when I stop to think I may begin to doubt that I possess it But I do know that I live my life as if I did I also know that other people live their lives as if they did Therefore, I cannot leave free will out of my picture of disease which must involve a concept of the mind.

The brain is certainly the product, like any other part of the body, of the genetic plan and the environment in which it develops It would therefore seem reasonable to me to suppose that the brain permits the development of consciousness, and that its physical characteristics

* The first Croonian lecture for 1950 delivered before the Royal College of Physicians of London on May 9 The second lecture will appear in a forthcoming issue

Association of Clinical Pathologists

The next meeting of this association will be held on Jan 25, 26, and 27, 1951, at the Westminster Hospital, London

Royal Society of Arts

On Wednesday, Nov 29, at 2 30 P M, Lord Horder will give a lecture to this society at their house in John Adam Street, London, W C 2, on Cities without Noise

Modern Methods of Diagnosis and Treatment

A series of postgraduate lectures with this general title is to be given at the hall of the Society of Apothecaries from Dec 4 to 8 Further particulars will be found in our advertisement columns

Christian Medical Fellowship

On Tuesday, Nov 28, at 8 15 P M, at the house of the Royal Empire Society, Craven Street, London, W C 2, Mr H J Seddon will speak on the Christian Heritage in Medicine

Aberdeen University Club in London

This club is holding a dinner and dance on Thursday, Dec 14, at the Hyde Park Hotel, Knightsbridge, S W 1 at 7 30 P M Tickets (25s) may be had from Dr Henderson, the secretary of the club, Southern Hospital, Dartford, Kent, before Dec 11

Ciba Foundation Lecture

Sir Stanton Hicks, professor of human physiology and pharmacology in the University of Adelaide, will deliver a lecture at the foundation, 41, Portland Place London, W 1 on Tuesday, Dec 12, at 5 P M He is to speak on the Rôle of Suprarenal Cortical Function in Disorders of Childhood

Accidents in the Home

This subject will be discussed at a meeting to be held in the Town Hall, Salford, at 2 30 P M, on Wednesday, Nov 29 The opening speakers are to be Dr C A Boucher, of the Ministry of Health, London, and Mrs Winifred Duncan, home safety department of the Royal Society for the Prevention of Accidents, London

Manx Crisis

According to press reports, the 34 Manx chemists who as we reported last week have withdrawn from the health service have intimated their willingness to resume work at once if the Health Service Board will give them three months notice, from Oct 1, of its intention to impose a charge on prescriptions and containers

Christmas Seals

The Canadian Tuberculosis Association have given the National Association for the Prevention of Tuberculosis 50 million seals to sell in aid of their funds The seals cost 4s for 100 and may be obtained from the N A P T, Tavistock House North, London, W C 1 Christmas cards (6d each) and whist score cards (10s per 100) are also for sale

"Closed Shop" in Durham

As mentioned in our parliamentary columns, Durham County Council has decided to dismiss any of its employees who do not belong to a trade union or professional association The 50 odd doctors who are involved are reported to have decided to ignore this ruling which is to be discussed again at a special meeting of the council on Nov 28

Scientists Talking

Sir Leonard Parsons, F R S, Prof A P Thomson, and Prof S Zuckerman, F R S are to be among the members of the new Lunar Society of the Air whose unscripted after dinner conversation on subjects of "public interest and real scientific significance" is to be broadcast on the Midland region of the B B C (276 m) The original Lunar Society, which met in Birmingham in the 18th century, included Dr Erasmus Darwin amongst its members The first meeting of the new series will be broadcast this evening, Nov 24 at 10 P M, when the Effects of Medical Progress will be the subject of the discussion Later subjects will include Pressure of Population on World Resources, Telepathy and the Future Evolution of Man

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On Nov 15, Sir James Learmonth was invested with the insignia of a chevalier of the League of Honour

Appointments

ARMITAGE RUTH, M B Lond anæsthetic registrar East Suffolk and Ipswich Hospital
HAWKINS C F M D Lond, M R C P D A asst physician United Birmingham Hospitals
HAYWARD J B W M B Birm medical director I C mass radiography unit Gloucester
JONES E M M B Lpool D P H asst county M O and district M O H Herts
RANGER DOUGLAS M B Lond F R C S consultant asst ear nose and throat surgeon, Middlesex Hospital London
WILSON B D R, M B Lond M R C P D C H consultant paediatrician St Andrew's Hospital, London
YOUNG I S M B Glasg F R C S E D L O consultant ear, nose and throat surgeon Norwich area

Colonial Service

CARLONI E M D M O Tanganyika
GILLIES M T M B Camb medical research officer grade III (medical entomologist) East Africa malaria unit of East Africa High Commission
GRAHAM CUMMING GEORGE M B Edin D P H D T M senior health officer Hong Kong
GRIFFITH G V A M D Dubl senior M O Hong Kong
HUDD H R M D Wales D A specialist (anæsthetist) Uganda.
KLIMCZYNSKI J J J T, M D Polish School of Medicine asst medical superintendent (temporary) Mental Hospital Barbados
McDONALD J A M B M O Uganda
VAIZEY J M M A M D Camb M R C P, D T M & H M O Uganda

Diary of the Week

NOV 26 TO DEC 2

Monday, 27th

INSTITUTE OF OPHTHALMOLOGY Judd Street W C 1
5 30 P M Mr B W Rycroft External Rhinostomies
MEDICAL SOCIETY OF LONDON, 11 Chandos Street W 1
8 30 P M Dr H L Marriott Dr N R Lawrie Maintenance of Fluid Balance

Tuesday 28th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M (London School of Hygiene, Keppel Street W C 1) Prof C Rimington Blood and Bile Pigments
INSTITUTE OF DERMATOLOGY, St John's Hospital Lisle Street, W C 2
5 P M Dr J O Oliver Pathology
INSTITUTE OF UROLOGY, St Paul's Hospital Henrietta Street, W C 2
11 A M Dr W N Mascall V D in relation to Pregnancy
EDINBURGH POST GRADUATE BOARD FOR MEDICINE
5 P M (Edinburgh University Anatomy Theatre) Prof Crighton Bramwell The Normal Heart

Wednesday 29th

INSTITUTE OF DERMATOLOGY
5 P M Dr R W Riddell Medical Mycology
INSTITUTE OF OPHTHALMOLOGY
5 30 P M Mr H Ridley Recent Advances in Ocular Therapeutics
INSTITUTE OF UROLOGY
11 A M Dr A H Harkness Urethritis of Non venereal Origin
NORTH EAST LONDON CLINICAL SOCIETY Prince of Wales's General Hospital Tottenham N 15
8 15 P M Dr C A Birch Some Medical Accidents
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242 St Vincent Street Glasgow
5 P M Prof Ian Aird Lymphœdema (John Burns lecture)

Thursday, 30th

ROYAL COLLEGE OF SURGEONS Lincoln's Inn Fields W C 2
5 30 P M Prof G Grey Turner Simple Stricture of the Œsophagus
BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M Prof G W Pickering Mechanism of Hypertension
INSTITUTE OF DERMATOLOGY
5 P M Dr B Russell Diseases Caused or Aggravated by Light
INSTITUTE OF PSYCHIATRY Maudsley Hospital Denmark Hill S E 5
3 P M Prof A Meyer The Frontal Lobe
INSTITUTE OF UROLOGY
11 A M Dr R Lees Sociological Problems of V D
ST GEORGE'S HOSPITAL MEDICAL SCHOOL Hyde Park Corner S W 1
4 30 P M Dr Anthony Feiling Neurology lecture demonstration
HONYMAN GILLESPIE LECTURE
5 P M (Edinburgh University Anatomy Theatre) Dr C M Seward Colonic Pain and the Colon Neurosis
LIVERPOOL MEDICAL INSTITUTION 114 Mount Pleasant Liverpool 3
8 P M Mr R Marcus Tracer and Therapeutic Studies with Radio Isotopes

Friday 1st

MAIDA VALE HOSPITAL MEDICAL SCHOOL Maida Vale W 9
5 P M Dr Douglas McAlpine Clinical neurological demonstration
INSTITUTE OF OPHTHALMOLOGY
5 30 P M Dr Helen Dimsdale Ophthalmological Manifestations of Cerebral Atrophy

THE PATIENT AND HIS DISEASE *

A E CLARK-KENNEDY
M.D Camb, F.R C P
PHYSICIAN TO THE LONDON HOSPITAL AND DEAN OF THE MEDICAL SCHOOL, FELLOW OF CORPUS CHRISTI COLLEGE, CAMBRIDGE

I HAVE not made any particular contribution to medicine which I can now take the opportunity to expound as Dr William Croone would have wished I, therefore propose, although I fully realise how ill qualified I am to make the attempt, to paint in these two lectures a picture of medicine as a single undivided whole. That I shall appear superficial is inevitable, too theoretical for your liking probable I shall be tedious, telling you nothing new, merely gathering up the strands and tying together the loose ends of our existing knowledge But I am so convinced of the need for a general concept on which we can to some extent agree that I am impelled to try Without it, we run a grave risk of losing touch with one another Moreover, our vision of the whole is tending to be obscured more and more by the increasing amount of technical knowledge which we must each acquire

Body and Mind

The ordinary man, student or teacher, doctor or patient, thinks of himself (when he is not attempting to argue metaphysics) as a body and mind, the former as something which he can see and feel, the latter as something intangible and yet as something of which he is absolutely certain. "I think, therefore I am" was the starting point of the Cartesian system of philosophy But what is body and what is mind? What is the relationship between them? What attitude to these problems should the doctor adopt? These questions must be answered, in so far as they can be answered, I think, at the start

Science, organised common sense, teaches that the human body is the product of the plan laid at its conception and the environment in which it develops It is often compared to a machine the design of which is the result of deliberate thought directed towards a certain end. But the design of the human body is the result of mutation and natural selection in the course of organic evolution A machine must be copied But the general design of the body is inherited. Machines are turned out to a standard pattern Bodies differ slightly, their individual details being largely determined by the chance mating of two people of opposite sex, and then, according to genetic theory, by the chance union of two gametes and the reshuffling of the genes The execution of a plan for a machine depends on deliberate action. The plan for a human body executes itself. A machine has to be actively maintained A human body, kept supplied with the necessary materials, maintains its characteristic form and function, as predestined in the plan whence it was derived, and continues to convert chemical energy into heat and the kinetic energy of movement In fact the human machine differs fundamentally from the machines of man's invention It is alive, self-developing and self maintaining, self repairing and self reproducing Moreover, it maintains a system of high energy content in a world in which the general tendency is in the direction of the dissipation of energy It permits the development and maintenance of consciousness and mind.

Consciousness appears to depend in some way on the brain which is part of the body The development of the mind under the stimulus of experience seems to be conditioned by the physiological characteristics of the brain (The individual mind, therefore, like the individual body, depends to some extent on chance) According to one view consciousness and mind are both epiphenomena of matter The brain is said to make consciousness, in much the same sense that the heart circulates the blood, and the reactions of the mind are said to be determined by physicochemical changes in the brain But if all human behaviour was determined by conditioned reflexes, consciousness, which allows of pain and pleasure, and permits the development of the conscious mind which asks the question, would still remain mysterious Materialism leaves the "I think, therefore I am," the certainty of self, entirely unexplained Moreover 20th-century physics has reduced the extension of concrete objects in space and time to conceptions of the mind, while modern physiology compels the conclusion that their sensory qualities, which we unthinkingly attribute to them in their own right, are really added by the human nervous system Idealism, however, is unsatisfactory It conceives that all physical events take place in mind, which is contrary to common sense (A real world must exist, although it seems unlikely that the human mind can comprehend reality) On the other hand, dualism in its Platonic or Cartesian form is difficult to justify, for body and mind are obviously intimately related And how can two things which are entirely distinct possibly affect each other?

The only practical way out of this dilemma seems to lie in adopting a monistic conception of the body-mind relationship—in conceiving of body and mind as different aspects of one reality, like form and substance, energy and matter, which we shall never fully understand. Do we not see drugs, diseases, operations on the brain, exerting a profound effect on the mind? Alteration of the body leads to alteration of the mind That is certain, and there is also evidence, I think, that alteration of the mind due to emotional shock, long imprisonment, religious conversion, mystical experience, mental disease, and even application of the mind to a profession, may have some *direct* effect on the structure and functions of the body, although less quickly, to a less extent, and less consistently We must picture body and mind developing together from birth and being maintained together throughout life, the one reacting back upon the other Such, as I see it, is the psychosomatic nature of mankind

We cannot, however, escape from the common conception of the dualism of our nature engendered by personal conviction based on individual experience of the freedom of the human will "All theory and evidence is against the freedom of the will," said Dr Johnson, "all experience for it" Now I do not propose to argue for or against the existence of the freedom of the human will, or to discuss the nature of something in ourselves which gives us the feeling of being able to control, within limits, our own thoughts and actions Still less shall I attempt to define the level where freedom ends and determinism begins I am concerned with a practical problem, endeavouring to outline a working conception of medicine in our present state of knowledge Now it is easy to argue against free will, and when I stop to think I may begin to doubt that I possess it But I do know that I live my life as if I did I also know that other people live their lives as if they did Therefore, I cannot leave free will out of my picture of disease which must involve a concept of the mind.

The brain is certainly the product, like any other part of the body, of the genetic plan and the environment in which it develops It would therefore seem reasonable to me to suppose that the brain permits the development of consciousness, and that its physical characteristics

* The first Croonian lecture for 1950 delivered before the Royal College of Physicians of London on May 9 The second lecture will appear in a forthcoming issue

condition the way in which the mind develops under the stimulus of education and experience It would also appear to me that the mind so developed can influence to some extent the further development and subsequent maintenance of the body But in our present state of knowledge I do not think that we are justified in assuming that the mind can be explained entirely in terms of the structure of the brain, which the individual inherits, and the experience through which he passes—in spite of the success of modern clinical psychology Something in our make up seems to allow us to force ourselves to some extent against the tides which tend to influence our thoughts and actions, and enables us to appreciate moral and æsthetic values which science is unable to take into account and which empirical psychology does not even attempt to explain Nevertheless, this dichotomy must be at a higher level than Plato or Descartes supposed At the lower level of the mind which is the legitimate field of medical practice, body and mind *are* intimately related In fact the Aristotelian conception of body and mind (Aristotle called it soul) intimately compounded, with the understanding or reason which asks the question and attempts the answer as something distinct, is a more satisfactory working hypothesis True that it was part of the scientific system which dominated the Middle Ages and which Descartes set out to destroy But it fits in better with our clinical experience today!

Variation, Constitution, and Disease

In health, as popularly conceived, a man, as thus in part we understand him—the product of his heredity, his experience and the use which he makes of his mind—is usually more or less unaware of the internal environment of his body Moreover, the working of his internal machinery has no effect on consciousness until the limit of the capacity of one of his functions is reached Then he does experience symptoms Now in the literal sense of the word he is diseased Similarly, except when his attention is concentrated on some particular object, he is only vaguely aware of his external environment, unless it changes suddenly Given time, the functions of his body usually keep his internal environment constant He can develop his muscles and increase his vital capacity a little, and by improving his coordination of movement increase the efficiency of his physical machine, but fatigue prevents him exerting himself to the point at which he would develop severe acidosis, and respiratory distress from overtaxing his heart as the result of running "all out" at the end of a race On the other hand, the body can adapt itself to continuous demand on function from within, as in the modification of structure which brings the economy of the pregnant woman into line with that of her developing child, and enables the heart to meet the additional load thrown on it when the peripheral resistance to the flow of blood increases It is also capable of adaption to some extent to a new environment, as in life at high altitudes, residence in the tropics, and employment in a new occupation In fact the human body is a coordinated, balanced, self regulating machine, in equilibrium with demand on function from within and (up to a certain point) in equilibrium with its changing environment without

But extensive variation is inevitable The chance of even two members of the same family (identical twins excepted) being derived from similar genetic plans must be remote Environment varies with race and creed, social circumstances, and economic conditions, class and cultural tradition often determining diet, exercise and recreation, and the outlook of the developing mind Besides, men elect to live their lives differently, meet with good or bad luck, and endeavour to modify their environment to suit their individual taste Every man, therefore, develops a constitution peculiarly his own, the product of his genetic origin and his life in his environment It evolves quickly in childhood as the plan whence he is derived takes shape, and in adult life it may seem fairly set But throughout life each new experience, physical or mental, plays some part in determining the reactions of his body or his mind to experience still to be encountered

Thus a man may grow up vigorous or lethargic, easily tired or capable of sustained exertion, placid or emotional, musical or mathematical His character is often reflected in his face and his state of mind in his expression His philosophy of life, it would appear, is to a large extent determined by what heredity and environment dictate One is somatically strong, his body can cope with considerable demand on function and he is adaptable to change of environment, and resistant to infection But he is psychologically weak, his mind cannot stand up to intellectual demand or emotional strain Another is somatically weak, more liable than other people to succumb to demand on physical function But he is psychologically strong, emotionally stable and capable of sustained mental effort A third is somatically weak and psychologically weak He cannot stand up either to physical or to mental strain His mind may be peculiarly sensitive to his body, so that a slight disturbance of physical health leads to depression unjustified by circumstances, or his body to his mind so that a slight emotional upset leads to over stimulation of his sympathetic nervous system A man of this type is bound to make "heavy weather" of any environment which this world is likely to provide

Some of the features of a man's constitution, as thus I conceive it, appear to be genetic His sex and blood group are certainly genetic, and the study of his family often suggests that the main peculiarities of his body and the outstanding characteristics of his mind are largely genetic Others seem to be due mainly to the action of the environment in which he is compelled to live or to the way in which he has chosen to live, for instance, his complexion, muscular development, and mental reactions, as a study of his life history reveals But it is very easy to make a mistake The plan whence every individual is derived is hidden, and "inheritance" of environment is very easily confused with true heredity Further, the distinction between the action of the genes and the influence of environment is far less clear now than was once supposed, and, for all we know, the specific force of the genes may be profoundly influenced by the conditions under which they act Genetic factors determine the way and extent to which the developing body responds to the influence of environment Two genetic plans in different environments can produce two individuals surprisingly alike Conversely, different environments can mould two genetic plans into similar shape In fact it seems reasonable to suppose that there are few bodily features commonly attributed to heredity which cannot also be produced mainly by environment, and few usually attributed to environment which cannot also sometimes be explained in terms of heredity The relative importance of genetic and environmental factors is exceedingly difficult to assess in any attempt to analyse the constitution of a man

The same difficulty arises in any attempt to analyse the causes of disease For disease, as we understand it, must be due to genetic faults, adverse factors in environment, or the way in which a man uses his mind, or to some combination of these three factors, interfering still further with the normal balance of human bodies or minds (In the present state of our knowledge we cannot conceive of it being produced in any other way) The body may fail to develop or maintain itself properly as a result of a serious fault in its genetic plan It may succumb to mischance in its environment The mind

may suffer in consequence of genetic or acquired disease of the body, or succumb to adverse factors influencing it direct through the understanding Diseases of the mind, in so far as the mind can be separated from the body, may interfere with the structure and functions of the body Moreover, a deliberate act of will may run the body into one of the risks in the environment against which it is unprotected but which it would have otherwise avoided. Lack of mental effort may result in a man failing to rise superior to circumstances from which there is no hope of physical escape

The Pathology of the Body

In pursuing this conception further, let us start with the material risks to which the body, divorced as far as possible from the influence of the mind, as we understand it, may from time to time succumb, in fact with the material risks which lead to structural changes that can be studied, at least to some extent, in the body after death These can be divided, in so far as it is justifiable to distinguish between heredity and environment (it is necessary to force this distinction to some extent in any attempt to analyse the causes of disease) into three groups Let us consider them in turn

1 There may be a fault in the genetic plan whence the individual is derived, with the result that his bodily machinery is not properly balanced from the start, or his brain will not permit the development of a normal mind. But life really starts at conception, and it is difficult in practice to distinguish between disease which is truly genetic and congenital disease which has been acquired in utero Nevertheless to confine our conception of genetic factors in the pathogenic disease to conditions transmitted according to Mendelian laws is to take too limited a view of their influence Genetic factors probably play a part in the pathogenesis of many other conditions, and on general grounds it seems reasonable to suppose that they must often be largely responsible for constitutional weakness of body and mind of sufficient severity to be dignified with the title of disease It is also probably true that many cases of congenital malformation of structure and abnormality of function, for which no environmental cause can be discovered, are genetic, although their true nature cannot be proved because the plan whence the individual is derived is hidden from our sight

2 The body may succumb to one of the many risks to which it is exposed in its environment during antenatal and postnatal life These fall into four main groups First, it may be damaged by physical forces These include heat, light, X rays (which lead also to aplasia of the bone marrow and are known to cause mutation of the germ plasm leading to genetic disease in subsequent generations), and trauma The risk of mechanical injury before birth is negligible, at birth considerable After birth it is variable, depending on individual way of life and occupation For the body may now be caught unawares by forces against which reflex action is inadequate to protect it, damaged by internal stress which it is constitutionally not strong enough to withstand, or overtaken by danger from which the conscious reactions of the mind and the functions of the body working to full capacity do not permit it to escape The second great risk in this class is malnutrition The body may be deprived for one reason or another of one or more of those substances on which its development and maintenance depend The supply of oxygen may fail It may run short of water, salt, calories, protein, vitamins, or minerals The third risk is poisoning by substances used in medical practice and industry or taken for pleasure The fourth and perhaps the greatest, is infection Before birth syphilis of the placenta may lead to abortion, stillbirth, or the congenital disease, and viruses passing through it in the early months of pregnancy are known to cause fœtal malformation After birth the body is exposed to invasion by pathogenic organisms and parasites, and may suddenly encounter a type of organism against which it is completely unprotected and to which it inevitably succumbs

3 Distinct from these two main classes of risk there is however, a third, encountered only under the peculiar circumstances which obtain during antenatal development A constitutional factor in the child, genetically determined according to Mendelian laws and antigenic to the constitution of its mother determined by the same laws, may lead to modification of her internal environment, and therefore of the external environment of her child Under these circumstances, if Rh antigen and antibody can both pass freely across the placental boundary, antigen antibody reactions in the child in the later months of pregnancy may lead to antenatal death, severe anæmia at birth, or a defect in the development of the brain predisposing to failure of mental development after birth This risk—and there may be others of a similar kind still to be discovered—links disease due to faults in the genetic plan with disease due to adverse factors in environment

The risks to which we are exposed are great In fact a man would not long survive his birth did he not inherit the potential power of reacting not only in such a way as to avoid most of the dangers to which he is constantly exposed, but also, when these reactions fail, in such a way as to conserve his structure and functions and (unless adverse factors act too strongly) maintain his existence as a unit of life and mind although at a lower level of efficiency Action on the body may interfere with growth, stimulate or depress function, destroy structure, undermine nutrition, or upset endocrine balance But the body is a balanced system, and action on the body almost always leads to reaction by the body Thus mechanical injury of all kinds leads to proliferation of tissue, which organises clot, closes wounds, and unites fractured bones Chemical poisons are eliminated by the lungs or kidneys, detoxicated in the liver or tissues, or stored in the bones Acute infection stimulates inflammation, fever, and immunity, chronic infection leads gradually to fibrosis But these reactions are not always advantageous to us, and sometimes man has to pay a price for this power with which every human body is endowed Reactionary fibrosis often leads to pressure or mechanical obstruction The innate capacity of the body to respond to antigens by the production of antibodies on which immunity depends is also responsible for Rh reactions in infants and many incompatible blood transfusions in adults, and often results in allergic reactions which may modify adversely the subsequent course of infection in the human body

These actions on, and these corresponding inborn reactions by, the body are the primary pathological processes of the body Thinking of them from the point of view of their cause, some appear to be genetic Others seem to be acquired during life in the environment Both can be congenital Sometimes a genetic defect transmitted according to Mendelian laws acts alone to alter structure and disturb function For instance, the meeting of two recessive genes of a certain type when the plan is laid leads to deafness when the child is born No adverse factor in environment can be held responsible for the condition, and we can be certain that the cause of it lay wholely in the plan whence the individual was derived At other times the cause of a disease seems to be wholly in environment When a normal man is damaged in an accident, is poisoned, or succumbs to some virulent infection to which he is unluckily exposed, it is difficult to blame his genetic origin His disease can be attributed entirely to mischance and to a pathological process of an

condition the way in which the mind develops under the stimulus of education and experience It would also appear to me that the mind so developed can influence to some extent the further development and subsequent maintenance of the body But in our present state of knowledge I do not think that we are justified in assuming that the mind can be explained entirely in terms of the structure of the brain, which the individual inherits, and the experience through which he passes—in spite of the success of modern clinical psychology Something in our make up seems to allow us to force ourselves to some extent against the tides which tend to influence our thoughts and actions, and enables us to appreciate moral and æsthetic values which science is unable to take into account and which empirical psychology does not even attempt to explain Nevertheless, this dichotomy must be at a higher level than Plato or Descartes supposed At the lower level of the mind which is the legitimate field of medical practice, body and mind *are* intimately related In fact the Aristotelian conception of body and mind (Aristotle called it soul) intimately compounded, with the understanding or reason which asks the question and attempts the answer as something distinct, is a more satisfactory working hypothesis True that it was part of the scientific system which dominated the Middle Ages and which Descartes set out to destroy But it fits in better with our clinical experience today

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lesion in the cerebrum leads to uncontrolled activity of the lower centres in the pons, it may stimulate growth or function out of proportion to the needs of the body as a whole or interfere with the balance of the endocrine system on which structure and function both depend But action on the body tends to reaction by the body Some of these reactions tend to defeat or aggravate adverse action on it, as in the production of antibody in response to antigen in immunity and allergy respectively Others lead to hypertrophy of some other structure and compensatory overaction, or to atrophy or reduction of the activity of some other function, maintaining integration of structure and function and conserving the body for the time being, although at a lower level of efficiency, as a unit of life and of potential or developed mind. Thus the course and final outcome of a disease process depends on the relative intensity and speed of adverse action on the body in relation to the rate at which, and the efficiency with which, the body reacts A sudden attack may overwhelm it when ill prepared or undefended, but adverse factors which act slowly do not lead to failure of function until the process of adaptation has reached its limits or for some other reason compensation suddenly breaks down

Nevertheless the distinction between action and reaction by the body, like most of the distinctions which the human mind imposes on nature, cannot always be maintained. "Action on" often merges imperceptibly into "reaction by" the body, the alterations of structure and disturbances of function produced appearing as a complicated pattern of relationships dominated (at least so it looks to us) by the body "struggling" under adverse circumstances "purposely" to keep itself alive Indeed it is difficult to contemplate the picture painted by disease without doubting the purely mechanical conception of causation. Hume's challenge has never really been answered, and the modern mathematical conception of the physical universe throws grave doubt upon the validity of the principle of mechanical causation Moreover, philosophical thought is tending to regard the universe as a progressive process which the human mind, as Kant maintained, carves up to fit in with its preconceived ideas of law, order, and causation One day we may revert to the Aristotelian conception that the cause lies to some extent in the end and not only in the events which come before it

When the patient dies, functional activity is suddenly arrested. Structural changes thus far produced—those due to action on and those due to reaction by the body—can be spread out to view on the post mortem table and seen for a brief period in relation to each other, as they were when the individual life was finally defeated They often throw light on the mechanism of death Sometimes the cause of it can actually be demonstrated More often the post mortem reveals it within the generally accepted sense, only because the structural changes revealed are typical, in appearance and distribution, of a known action on the body More often still there are no visible changes due to action on the body, and the diagnosis depends on the reactions by the body and the structural consequences of progressive failure of function But in a short illness there is little time for structural change due to reaction by the body or for structural change due to progressive failure of function, and under these circumstances, unless the post mortem reveals a sudden catastrophe, such as a fatal pulmonary embolus or an extensive cardiac infarct, it may fail to provide a complete explanation of the mechanism of death. Even in some chronic conditions—untreated diabetes and idiopathic steatorrhœa for instance—little structural change due to its primary cause can ever be demonstrated on the post mortem table The post mortem method has its limitations, particularly in acute cases No characteristic changes in the structure of the heart ever prove that death was due to ventricular fibrillation or status epilepticus. A functional conception of disease is necessary for that No functional conception explains death due to hydrocyanic acid poisoning or many cases of acute infection The basic chemical conception of disease which I have endeavoured to outline must now be invoked But not even that will explain why a man "blew out his brains," on which his mind was based, or flung into the water the body to which his brain belonged The pathology of the mind which deliberately drank the corrosive, swallowed the veronal tablets, or turned on the gas unlighted, calls for an explanation which examination of the dead body is unlikely ever to provide

The Pathology of the Mind

The brain is well developed by full term During fœtal life, however, the oxygen pressure in the arterial blood is too low to permit the development of consciousness and mind Consciousness can only start at birth Mind can only develop gradually under the stimulus of experience, a process which is difficult to study and which can only be described empirically in terms of attributes transmitted from one generation to the next and determined by the structure of the human brain Subjective sensations of pleasure and pain presumably come first Then satisfaction and frustration of instinct stimulate emotional feeling—so at least we must suppose—experience being stored in memory permitting the association of past events and rendering a conception of the future possible As time passes, reason under the stimulus of observation and experience, and later under the stimulus of education, discovers that certain principles, once grasped from a few examples, are self evident in the sense that they never stand in need of further proof Thus individually we began to understand the world Thus collectively we have arrived at empirical and a-priori knowledge But the intellect can develop only within the limits set by the functional efficiency of the cerebral machinery, the third-class differing from the first-class mind, we must suppose, because of physicochemical differences in the underlying brain "Two glasses can be equally full," said Dr Johnson, "but one holds more water"

Normally the brain permits the development under the stimulus of experience, and the subsequent maintenance, of a mind of average intellectual ability and sufficiently robust to weather the mental stresses and emotional storms of an average life But it is always bound to give way if at any time a pathological process of the body interferes sufficiently with the structure of the brain or with any function of the body on which the brain depends A head injury may lead to permanent mental defect Deficiency of vitamin B is associated with characteristic mental failure Arterial anoxæmia due to low oxygen pressure in the atmosphere or to advanced disease of heart or lungs may lead to complete confusion Chemical poisons, alcohol, morphine, and cocaine cause mental deterioration Acute infections may lead to delirium, chronic infections to mental changes depending in part on the nature of the infection and in part on the personality of the patient Progressive failure of the cerebral circulation due to the degenerative changes of advancing age often leads to exaggeration of individual characteristics, sometimes to reversal of character, occasionally to complete alteration of personality But in all these conditions the mind is not primarily affected If the body recovers, the mind recovers, provided no permanent damage has been done

Sometimes, however, the development of the brain does not permit the development of a normal mind In some children a defect in the genetic plan or adverse factors in intra uterine environment lead to mental deficiency In others intellectual development proceeds normally but the brain so conditions the development of

acquired kind But in most conditions environment is merely revealing an innate predisposition, and the view held as to the causation of many diseases is likely to depend very largely on the standpoint of the particular observer Thus a doctor seeing a tendency to scurvy or tuberculosis in a family in his practice among a population living on a poor diet may well think in terms of genetic weakness The public health officer, on the other hand, with access to statistics and surveying the scene as a whole, is more likely to attribute the increasing incidence of the disease mainly to environment Hence, I think, the concentration on heredity diathesis in the 18th and on environmental factors with the deterioration of the standard of living and the growth of the public health services in the 19th century In the 20th century we ought to be able to take a more balanced view Genetic and environmental factors interact in the pathogenesis of most clinical conditions Even hæmophilia remains unsuspected until some trivial injury precipitates bleeding, and colour blindness often passes unrecognised unless it leads to some disaster Proneness to commit misjudgments predisposing to accidents may be to some extent genetic, and there is evidence that peculiar liability to vitamin deficiency, idiosyncrasy to chemical substances, and particularly susceptibility to infection are often genetic The association of increasing maternal parity with the occurrence of certain congenital conditions in uniovular twins, more commonly than can be explained in terms of probability, suggests that they are the product of genetic and intra uterine factors Statistical evidence points to a genetic predisposition to many of the disorders of later life, and the common occurrence of a disease more frequently in one sex than in the other suggests a partially sex limited genetic factor in its pathogenesis, although some adverse factor in environment must lead the individual to succumb Many diseases are probably due to the chance combination of a peculiar genetic weakness with a particular environmental defect

Trauma, malnutrition, chemical poisoning, and infection (although no absolute distinction can be drawn between them), and the corresponding reactions by the body, stand out as pathological processes which we can claim, at least to some extent, to understand New growth, the degenerative changes of advancing age, and a number of other recurring structural changes in the human body still remain mysterious How are we to think of them from this point of view in our present state of knowledge ?

The growth of all living things depends on heredity and environment, and new growth seems likely to be due to mutation or to some permanent alteration of the environment of certain cells The discovery that some types of malignant growth can be started in animals by the application of chemical substances, and then transmitted indefinitely by implantation, certainly suggests that naturally occurring cancer may be due to the production (or failure of production) of some chemical substances within the body as the result of trauma, infection, or degeneration, changing the genetic constitution of certain cells, altering their growth behaviour The transmission of other types by the injection of cell free extracts suggests that they may be due, in part at least, to a virus gaining access to certain cells and then being transmitted at each cell division, with the result that all successive generations inherit the same environment Further than that we cannot go at present

Wear and tear must play some part in the pathogenesis of the degenerative processes of advancing age, but the frequent death of identical twins from arteriosclerotic causes at the same period of life suggests that genetic factors must be more important than is generally supposed Genetic make-up predisposes to acquired conditions, and one acquired pathological process predisposes to another—trauma to infection, infection to malnutrition, and malnutrition to infection

Bearing all the facts in mind it seems reasonable to suppose that all structural changes met with in the body —new growth, degeneration, and the rest—are potentially capable of explanation in terms of variation on the same major theme They depend in fact on complicated reactions at different ages between genetic constitution and the functional disturbances (including allergy and disturbance of endocrine balance) produced by different combinations of four acquired pathological processes corresponding to the four great risks to which we are exposed (it is difficult to conceive of any others)—namely, trauma, malnutrition, chemical poisoning, and infection

What is the basic nature of these four processes ? If we take them one by one we shall see that they must be chemical The genes are said to be non repetitive crystalline molecules which in some way transform the chemical nature of substances derived from the environment and arrange them in a pattern giving rise to the characteristic architecture and the regular reactions which underlie the functions of the human body A pathological process of genetic origin, therefore, must be chemical Pathological processes due to lack of the substances on which the maintenance of nutrition depends are obviously chemical Mechanical injury, heat, cold, and radiation are forms of physical action, but no fundamental distinction between chemical and physical action can be maintained Poisons exert their action chemically, some by destroying living tissue by oxidation or the coagulation of protein on which the structure of living cells depends, others by exerting a specific action on some function of the body Pathogenic organisms affect the body by secreting substances which exert a specific action on certain tissues, by competing for the substances on which its life depends, by producing substrates out of which its enzymes produce useless metabolites, or by stimulating allergic reactions Infective disease must depend on interaction between the chemical way of life of parasite and human host All organic pathological processes, therefore, are essentially of physicochemical nature, chemical action on, and chemical reaction by, the body tending to alter the static chemical arrangements which determine its structure or to disturb the dynamic reactions on which its functional attributes depend A pathological process is a chemical modification of the body

A chemical concept of a pathological process is necessary before we can claim to understand it completely But in practice it is usually sufficient to think in terms of the structural changes and functional disturbances in which chemical changes are reflected And we must remember that our distinction between structure and function is artificial (It is our minds which force structure and function apart and technical considerations which compel us to teach them separately) Function is changing structure, and structure is static function Both depend on the physicochemical nature of the body The former on the labile reactions and the latter on the static reactions of the body Structure and function cannot really be divorced Functional change leads to structural consequences, as in the hypertrophied heart of hypertension and the anasarca of heart failure Structural change leads to functional consequences, as in the heart failure of rheumatic carditis and the vomiting of pyloric obstruction Let us, therefore, leave chemistry behind and proceed to think instead of pathological process in terms of alteration of structure and disturbance of function which can be observed directly

Action on the body may destroy structure or lead to failure of function It may unmask some more primitive mechanism For instance when disease of the auricular ventricular bundle reveals idioventricular rhythm, or a

lesion in the cerebrum leads to uncontrolled activity of the lower centres in the pons, it may stimulate growth or function out of proportion to the needs of the body as a whole or interfere with the balance of the endocrine system on which structure and function both depend But action on the body tends to reaction by the body Some of these reactions tend to defeat or aggravate adverse action on it, as in the production of antibody in response to antigen in immunity and allergy respectively Others lead to hypertrophy of some other structure and compensatory overaction, or to atrophy or reduction of the activity of some other function, maintaining integration of structure and function and conserving the body for the time being, although at a lower level of efficiency, as a unit of life and of potential or developed mind. Thus the course and final outcome of a disease process depends on the relative intensity and speed of adverse action on the body in relation to the rate at which, and the efficiency with which, the body reacts A sudden attack may overwhelm it when ill prepared or undefended, but adverse factors which act slowly do not lead to failure of function until the process of adaptation has reached its limits or for some other reason compensation suddenly breaks down.

Nevertheless the distinction between action and reaction by the body, like most of the distinctions which the human mind imposes on nature, cannot always be maintained. "Action on" often merges imperceptibly into "reaction by" the body, the alterations of structure and disturbances of function produced appearing as a complicated pattern of relationships dominated (at least so it looks to us) by the body "struggling" under adverse circumstances "purposely" to keep itself alive Indeed it is difficult to contemplate the picture painted by disease without doubting the purely mechanical conception of causation Hume's challenge has never really been answered, and the modern mathematical conception of the physical universe throws grave doubt upon the validity of the principle of mechanical causation. Moreover, philosophical thought is tending to regard the universe as a progressive process which the human mind, as Kant maintained, carves up to fit in with its preconceived ideas of law, order, and causation One day we may revert to the Aristotelian conception that the cause lies to some extent in the end and not only in the events which come before it.

When the patient dies, functional activity is suddenly arrested. Structural changes thus far produced—those due to action on and those due to reaction by the body—can be spread out to view on the post mortem table and seen for a brief period in relation to each other, as they were when the individual life was finally defeated. They often throw light on the mechanism of death Sometimes the cause of it can actually be demonstrated More often the post mortem reveals it within the generally accepted sense, only because the structural changes revealed are typical, in appearance and distribution, of a known action on the body More often still there are no visible changes due to action on the body, and the diagnosis depends on the reactions by the body and the structural consequences of progressive failure of function. But in a short illness there is little time for structural change due to reaction by the body or for structural change due to progressive failure of function, and under these circumstances, unless the post mortem reveals a sudden catastrophe, such as a fatal pulmonary embolus or an extensive cardiac infarct it may fail to provide a complete explanation of the mechanism of death. Even in some chronic conditions—untreated diabetes and idiopathic steatorrhœa for instance—little structural change due to its primary cause can ever be demonstrated on the post mortem table The post-mortem method has its limitations, particularly in acute cases No characteristic changes in the structure of the heart ever prove that death was due to ventricular fibrillation or status epilepticus. A functional conception of disease is necessary for that No functional conception explains death due to hydrocyanic acid poisoning or many cases of acute infection The basic chemical conception of disease which I have endeavoured to outline must now be invoked But not even that will explain why a man "blew out his brains," on which his mind was based, or flung into the water the body to which his brain belonged The pathology of the mind which deliberately drank the corrosive, swallowed the veronal tablets, or turned on the gas unlighted, calls for an explanation which examination of the dead body is unlikely ever to provide

The Pathology of the Mind

The brain is well developed by full term During fœtal life, however, the oxygen pressure in the arterial blood is too low to permit the development of consciousness and mind Consciousness can only start at birth. Mind can only develop gradually under the stimulus of experience, a process which is difficult to study and which can only be described empirically in terms of attributes transmitted from one generation to the next and determined by the structure of the human brain. Subjective sensations of pleasure and pain presumably come first Then satisfaction and frustration of instinct stimulate emotional feeling—so at least we must suppose—experience being stored in memory permitting the association of past events and rendering a conception of the future possible As time passes, reason under the stimulus of observation and experience, and later under the stimulus of education, discovers that certain principles, once grasped from a few examples, are self evident in the sense that they never stand in need of further proof Thus individually we began to understand the world Thus collectively we have arrived at empirical and a-priori knowledge But the intellect can develop only within the limits set by the functional efficiency of the cerebral machinery, the third-class differing from the first-class mind, we must suppose, because of physicochemical differences in the underlying brain "Two glasses can be equally full," said Dr Johnson, "but one holds more water"

Normally the brain permits the development under the stimulus of experience, and the subsequent maintenance, of a mind of average intellectual ability and sufficiently robust to weather the mental stresses and emotional storms of an average life But it is always bound to give way if at any time a pathological process of the body interferes sufficiently with the structure or the brain or with any function of the body on which the brain depends. A head injury may lead to permanent mental defect Deficiency of vitamin B is associated with characteristic mental failure Arterial anoxæmia due to low oxygen pressure in the atmosphere or to advanced disease of heart or lungs may lead to complete confusion Chemical poisons alcohol, morphine, and cocaine cause mental deterioration Acute infections may lead to delirium, chronic infections to mental changes depending in part on the nature of the infection and in part on the personality of the patient Progressive failure of the cerebral circulation due to the degenerative changes of advancing age often leads to exaggeration of individual characteristics, sometimes to reversal of character, occasionally to complete alteration of personality But in all these conditions the mind is not primarily affected. If the body recovers, the mind recovers, provided no permanent damage has been done

Sometimes however, the development of the brain does not permit the development of a normal mind In some children a defect in the genetic plan or adverse factors in intra uterine environment lead to mental deficiency In others intellectual development proceeds normally but the brain so conditions the development of

the mind, and the developed mind so conditions the subsequent maintenance of the brain, that the individual has difficulty in standing up to emotional strain during adolescence and is predisposed to mental breakdown in later life under mental stress or in physical ill health In these cases there is often a family history of mental instability suggesting the transmission of a tendency to mental disease through the structure of the brain Disease of this kind is also associated, as might be expected, with characteristic physical features, while different types are linked to sex in a way which cannot be explained in terms of predominantly male or female occupations Moreover, individual cases can seldom be interpreted in terms of psycho analytical theory, and usually fail to respond to psychotherapy, some form of "shock" directed to the brain being required in their treatment True, that no organic pathological processes of the body and no histological changes in the brain have ever been demonstrated, but all the evidence points to some structural peculiarity of the cerebrum predisposing to mental breakdown in these patients No absolute dividing line can be drawn, however, between functional psychoses, due to defects of the brain which as yet have defied analysis at the physicochemical level, and organic psychoses due to recognisable pathological processes of the body

In other children the somatic constitution of the brain has permitted normal development of intellect and greater emotional stability, but if circumstances are unfavourable they are liable to grow up with a tendency to react abnormally in one way or another to the stresses and strains of adult life In one, repression of instinct leads to a permanent state of mental tension In another a capacity to dissociate ideas and respond to suggestion permits subconscious escape from difficult situations or emotional satisfaction in abnormal ways These conditions are not, as would be expected, associated with any particular characteristic of the body Nor is there often a definite history of mental instability in the family Electro encephalograms show no abnormality, and many cases can be explained, in part at least, by psycho analytical investigation of their mental development They respond to psychotherapy but are not benefited by empirical treatment directed to the brain But again no absolute dividing line can be drawn The psycho neuroses merge imperceptibly into the extreme varieties of normal human personality as generally accepted Neither is there any exact dividing line between the functional psychoses and the psychoneuroses Nevertheless it would appear that in the former we should attribute more blame to the physical constitution of the brain and less to abnormal experience, and in the latter less to defect of the brain and more to the experience which on investigation proves to have been unfortunate in early life

The psychoneuroses are sometimes regarded as patho logical processes of the mind, but pathological processes of body and pathological processes of mind differ funda mentally The former are usually due to abnormal action on, and a normal reaction by, the body, abnormal reaction to normal stimulation, allergy for instance, being on the whole less common The latter are usually due to normal action on and abnormal reaction by the mind, in other words, abnormal reactions to the kind of stress to which everyone is subjected, mental breakdown entirely due to abnormal experience, true neurasthenia being relatively uncommon except in time of war More over, mind, as man knows it, cannot exist without a functional body, and pathological processes of the mind cannot ever be divorced from the body in the way that pathological process of the body can sometimes be divorced from the mind This is why I think it is question able if we can really say that they exist The health of the body can influence the psychoneurotic just as much as it can influence the normal reactions of the mind Therefore, we cannot ever ignore the physical health of the body on which our patient's mind is based

Freedom of the Will

Disease, as I have said, must be due to faults in the plan whence the individual is derived, to adverse factors in the environment in which he lives, or to the way in which he uses his mind, or, as is often the case, to some combination of these three causes I have discussed at some length the part played by heredity and environ ment Let me now touch on the problem of the use of the mind in relation to disease For practical medicine must reckon with the apparent freedom of the human will (Education and the law assume it) Disease does not always depend on genetic bad luck or environmental mischance Rather, as we must admit, unless we subscribe to the doctrine of determinism, a deliberate act, some times of the kind universally admired, at other times of the kind held in general contempt, may lead a man to expose his body to trauma, malnutrition, chemical poisoning, or infection from which it would otherwise have escaped. It is even possible that a way of life, good or bad according to generally accepted standards, may accelerate or retard the degenerative processes of advancing age Moreover, although organic disease undermines the power of the will, does not failure to exercise this power play some part in the genesis of psychoneurotic reactions? Cannot these people make some effort of their own, apart from influence brought to bear upon them, to overcome the handicaps of instinct, environment, and personality, as we all believe we can ourselves in the control of our own lives and the reactions of our more normal minds? But even if we are just machines determined by heredity and past experience, which few really believe, medicine cannot escape the problem of the way in which a man should live and use his mind from whatever source it is derived The mind is an important factor in the pathogenesis of human disease We can influence the mind profoundly Inevitably, therefore, medicine collides head on at times with moral problems

Some believe in the existence of an objective moral law Others hold ethical codes to be a product of organic evolution necessary to social living and advantageous to the State, individual moral standards to be subjective judgments determined by environment and past experi ence But with this dichotomy in our interpretation of life we are not immediately concerned For in whatever direction the truth actually lies, the fact remains that most people have some moral sense, be it the result of the repressions of the nursery, the conventions of society, their desire to retain the respect of other people, their religious education, or their own thought out philosophy A man, therefore, lives in practice, not only in a physical environment of material things and a mental environment of experience affecting him through his understanding, but also in a moral environment, be it the product of his religious education, his own experience, or his a priori intuition of a moral order in the Universe "Thou shalt love the Lord thy God and Him only shalt thou serve" is the teaching of the Jewish law "Above all, to thine own self be true" said Polonius in giving fatherly advice to Laertes on the eve of his visit to England "Act only according to that principle," wrote Kant, "which you can at the same time will to be a universal law"

Medicine is not primarily concerned with moral problems, but when moral sense exists, health and moral judgment may conflict Action right from the point of view of health may be wrong from the point of view of a patient's moral standards Then, if he follows medical advice, his mind is sick Conversely, action wrong from the point of view of health may be right from the point of view of moral standards. Then, if he risks his physical

health, he retains his self respect Under certain circumstances in an individual life there may be no escape from this dilemma At this level of the mind the will, if free to take its choice, must endeavour to escape from the trammels of heredity and the influence of past experience Perhaps this is not possible I do not know Sir, I have reached the limits of our human understanding Let that stop me tonight At the highest level of the mind fools rush in, I sometimes think, where wise men well may fear to tread

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LECTURER IN THERAPEUTICS IN THE UNIVERSITY OF SHEFFIELD
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THE treatment of thrombo embolic disease with anti coagulants is now widely practised, the choice of drug lying between heparin and the coumarin preparations Heparin is effective and safe, but its use is limited by expense and the difficulty of continuous or frequent intermittent intravenous administration, whereas the coumarin preparations, in spite of the risk of hæmorrhage involved, are extensively used because of low cost and ease of administration Burt et al (1949) have reported trials on a new coumarin substance, bis 3, 3′ (4 oxycou marinyl) ethyl acetate (' Tromexan '), which is said to have fewer of the disadvantages of the older dicoumarol preparations

The short period of action of heparin and the ease with which it can be neutralised by fresh blood or by protamine sulphate provide a wide margin of safety which would make it the ideal anticoagulant if a method of administration at infrequent intervals by an alternative route could be used Fullerton and Anastasopoulos (1949) have re emphasised that, until effective intra muscular preparations of it are available with an action lasting many hours, heparin is unlikely to be used for more than a few days at a time, and effective treatment is usually desired for a longer period

Efforts have been made to overcome these difficulties by incorporating heparin in a medium which would delay absorption when given by intramuscular injection, and Bryson and Code (1944) used a preparation in which the heparin was incorporated with beeswax It has been suggested that the action of intravenous heparin can be prolonged by the simultaneous use of ' Caronamide ' (Sirak et al 1948), but caronamide can give rise to toxic effects and therefore should not be used as a routine

G P Pitkin (unpublished work cited by Loewe et al 1942) devised a medium consisting of glucose, acetic acid and gelatin to slow the rate of absorption of water soluble drugs given intramuscularly or subcutaneously Heparin was first used in this vehicle by Loewe et al (1942), who, using the subcutaneous route, produced a satisfactory increase in the coagulation time in rabbits Loewe and Rosenblatt (1944), using 200–300 mg of heparin every 48–72 hours, obtained clotting times of 25–60 minutes in fifteen patients with thrombophlebitis They noted that after a single dose of 100 mg there was a delay of several hours before any definite increase in coagulation time, but that the increase was sustained for 2–5 days

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We have been unable to find any report of a fatality due to heparin/Pitkin, but all who have used the men struum have commented on the local swelling, pain, and tenderness at the injection site Apparently this has never necessitated withdrawal of therapy, and the pain has been controlled with analgesics Loewe and Hirsch (1947) and Loewe and Eiber (1949) state that careful buffering is necessary to make the gel " more physiologically acceptable " and reduce the irritation Weiner and Lange (1947) found that repeated subcutaneous injections at the same site in rats and rabbits produced hæmato mata, often so large that the animals died from acute blood loss In some instances the heparin was trapped in these hæmatomata, with the result that the coagulation time of the circulating blood did not increase These workers point out that in clinical practice the risk of serious blood loss must be very much less, since the size of any hæmatoma relative to that of the total vascular bed is much smaller in man than in rabbits

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It seems, however, that in some workers' experience, heparin/Pitkin is a safe and adequate anticoagulant The preparation used by the American workers cited had been supplied by William R Warner & Co Inc, and has not been generally available in this country We report below our experience in 24 cases treated with heparin/Pitkin made by Boots Pure Drug Co

INVESTIGATION

The clinical material consisted of cases studied in the wards of the Royal Infirmary, Sheffield, and of Hammersmith Hospital (Postgraduate Medical School of London) 24 patients with thrombo embolic disease (venous thrombosis 8, myocardial infarction 6, pulmonary embolism 9, and arterial embolism 1) were treated with heparin/Pitkin The object of the clinical trial was primarily to assess the efficacy of heparin/Pitkin in prolongation of the coagulation time, and no specific attempt was made to investigate the effect of anti coagulant therapy in the treatment of thrombo embolic disease The patients selected for therapy were chosen because it was felt that the administration of anticoagulant substances was unjustified in the absence of clear indications for this form of therapy

METHOD

Heparin Pitkin was prepared in 2 ml. ampoules according to the following prescription

Heparin (*B.P*) 20 000 I.U (200 mg)
Gelatin (*B.P*) 360 mg
Dextrose (*B.P*) 160 mg
Acetic acid (*B.P*) 0·03 ml.
Water to 2 ml

* Formerly Research Fellow and Tutor in Therapeutics University of Sheffield

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It seems, however, that in some workers' experience, heparin/Pitkin is a safe and adequate anticoagulant The preparation used by the American workers cited had been supplied by William R Warner & Co Inc , and has not been generally available in this country We report below our experience in 24 cases treated with heparin/Pitkin made by Boots Pure Drug Co

INVESTIGATION

The clinical material consisted of cases studied in the wards of the Royal Infirmary, Sheffield, and of Hammersmith Hospital (Postgraduate Medical School of London) 24 patients with thrombo embolic disease (venous thrombosis 8 , myocardial infarction 6 , pulmonary embolism 9 and arterial embolism 1) were treated with heparin/Pitkin The object of the clinical trial was primarily to assess the efficacy of heparin/Pitkin in prolongation of the coagulation time, and no specific attempt was made to investigate the effect of anti coagulant therapy in the treatment of thrombo embolic disease The patients selected for therapy were chosen because it was felt that the administration of anticoagulant substances was unjustified in the absence of clear indications for this form of therapy

METHOD

Heparin Pitkin was prepared in 2 ml. ampoules according to the following prescription

Heparin (*B.P*) 20 000 I.U (200 mg)
Gelatin (*B.P*) 360 mg
Dextrose (*B.P*) 160 mg
Acetic acid (*B.P*) 0·03 ml
Water to 2 ml

* Formerly Research Fellow and Tutor in Therapeutics University of Sheffield

At room-temperature this preparation is a solid gel It was therefore necessary to warm it to body heat and, when it became fluid, to draw it into the syringe through a wide bore needle 1 ml. of 2% procaine (20 mg) was then drawn into the syringe, and the mixture injected slowly into a large muscle mass, the position of choice being the anterolateral aspect of the thigh In many cases a further 1 ml of procaine was injected down the track of the needle Care was taken to spread subsequent injections over a wide area Coagulation-times were estimated twice daily (9 30 A M and 4 30 P M) by Lee and White's method, which has a normal range of 2–10 minutes The aim of treatment was to obtain average coagulation times of 20–25 minutes, a range considered to be satisfactory by Allen et al (1946) The drug was injected at noon only, or at noon and at midnight when, as became usual, twice daily injections were necessary After some unfavourable experience with subcutaneous injections as used by American workers, we invariably used the intramuscular route The injection should never be given in a part of a limb which is in the least degree œdematous or in which there is evidence of poor venous circulation, because the absorption in such cases is irregular and erratic

RESULTS

The results are tabulated in the accompanying table It can be seen that all patients except three (cases 17, 22, and 23) showed a satisfactory response with prolongation of the coagulation time Case 17 was completely resistant to doses of up to 1 g daily, no significant alteration in coagulation time occurring Local reactions in this case were slight, hence there seemed no reason to doubt that the heparin was reaching the general circulation *Satisfactory prolongation of the coagulation*

RESULTS OF TREATMENT WITH HEPARIN/PITKIN IN THROMBO-EMBOLIC DISEASE

Case no	Sex	Age (yr.)	Diagnosis	Duration of treatment (days)	Average dosage (mg)	Average coagulation time (Lee and White) (min.)	Remarks
1	F	57	Myocardial infarction	25	400 on alternate days	12–16	Inadequate dosage recovery
2	M	53	Pulmonary embolism	21	See fig 1		Poor levels until dosage increased, recovery
3	F	61	Pulmonary embolism	15	200–400 12 hrly	16–24	Rather uneven levels, recovery
4	M	57	Phlebothrombosis	2	400 12 hrly	20	Very satisfactory, drug only used at end of course of intravenous heparin recovery
5	M	45	Pulmonary embolism	10	200 12 hrly	24	Satisfactory therapy, but rather painful, good levels recovery
6	F	38	Phlebothrombosis	5	200 12 hrly	20	Satisfactory coagulation times, but treatment stopped because of pain and hæmatoma
7	M	42	Phlebothrombosis, pulmonary embolism	4	See fig 3		Treatment stopped because of hæmaturia
			(Second course)	12	200–400 12 hrly	16–24	Irregular absorption and levels, continued to have pulmonary emboli died
8	M	63	Pulmonary embolism	11	See fig 2(A)		Satisfactory, little pain recovery
9	M	48	Phlebothrombosis pulmonary embolism	9	See fig 4		Irregular absorption, large local hæmatoma, treatment discontinued, recovery
10	F	44	Myocardial infarction	12	200 12 hrly	16–28	Satisfactory coagulation times no complication but patient died after further infarction
11	M	65	Phlebothrombosis	7	200 12 hrly	20–24	Satisfactory little discomfort, recovery
12	M	62	Myocardial infarction	13	See fig 2(b)		Fairly satisfactory very little pain or discomfort, recovery
13	F	54	Bilateral deep femoral venous thrombosis	2	200 12 hrly	18	Spreading œdema left no suitable injection site in legs painful in shoulder muscle mass, discontinued, recovery
14	M	49	Myocardial infarction	11	See fig 2(c)		Satisfactory but patient died after further infarction
15	M	37	Pulmonary embolism	8	200–400 12 hrly	17–22	Some local discomfort only recovery
16	M	63	Pulmonary embolism	10	200 12 hrly	16–20	Satisfactory, but some local discomfort recovery
17	F	60	Mitral stenosis, auricular fibrillation femoral embolus	7	200–400 12 hrly	7–12	Resistant no prolongation of coagulation time died
18	F	63	Thrombophlebitis of calf	6	200 12 hrly	15–20	Fairly satisfactory; normal coagulation time only 1 min, recovery
19	M	69	Myocardial infarction	8	400 24 hrly	15–24	Treatment stopped because of local pain and discoloration pyrexia
20	M	47	Myocardial infarction	5	200–400 12 hrly	16	Treatment stopped because of severe local reaction and hæmatoma, albuminuria pyrexia
21	M	59	Pelvic venous thrombosis	7	100–200 12 hrly	17–30	Very sensitive died after ligation of inferior vena cava
22	M	55	Pulmonary embolism	4	200–400 12 hrly	12–14	Resistant local reaction when dose was raised
23	F	48	Mitral stenosis pulmonary emboli	4	200 12 hrly	8–15	Treatment stopped because of large hæmatoma died in congestive heart failure
24	F	74	Pulmonary embolism	3	100–200 12 hrly.	20–30	Very sensitive treatment stopped recovery

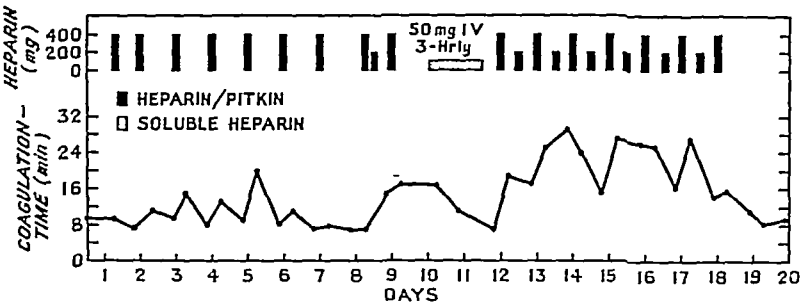

Fig 1—Pulmonary embolism in a man aged 53 (case 2) showing inadequacy of dosage until heparin/Pitkin was given twice daily Recovery

time was not obtained in case 22, and local pain associated with a larger dose necessitated the substitution of intra venous heparinisation Even with 50 mg three hourly intravenously this patient showed resistance to the drug Case 23 developed large hæmatomata at the sites of injection, so the treatment had to be stopped before an effective dosage had been reached The dosage used varied from 2 ml (200 mg) twelve hourly to 4 ml (400 mg) twelve hourly In case 1 200 mg every forty-eight hours was tried but found to be inadequate, as was 400 mg every twenty four hours Experience with this case and with case 2 (fig 1) showed that twelve hourly injections were necessary to achieve and maintain a satisfactory coagulation time Subsequently all cases were given 200 mg twelve hourly initially, and this dose was increased to 400 mg twelve hourly when necessary

Treatment was continued for at least 10–14 days whenever possible In most cases fluctuations occurred in the coagulation time, and it was noted that the dosage requirements varied from patient to patient and from day to day in the same patient, making it difficult to predict the clotting-time from the dosage used Irregularity in absorption of the heparin was probably the major factor causing this unevenness Some patients seemed to require less heparin after the first two or three days' treatment, whereas others seemed to require more

Fig 2 shows the type of satisfactory response obtained in three of the patients (cases 8, 12, and 14) These curves illustrate several points which we noted in our experience with heparin/Pitkin Firstly, it was often necessary to use during the first few days a slightly higher dosage than might subsequently be necessary to maintain adequately prolonged coagulation times If it became necessary subsequently to increase the daily dosage of heparin/Pitkin to attain levels previously obtainable with a lower dosage, the usual explanation was that the drug was not being adequately absorbed into the general circulation, and care was necessary to avoid its sudden release with possibly disastrous results (case 9) Secondly, a fall in the coagulation times from a previously constant level could often be remedied by the occasional isolated administration of a higher dose Thirdly, if the patient was not intolerant of pain produced by injection of heparin/Pitkin in the first three days, it was usually possible to continue its administration for a week or more if necessary

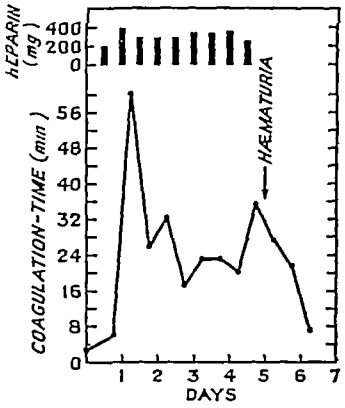

Fig 3—Phlebothrombosis and pulmonary emboli in a man aged 42 (case 7) showing initial response to treatment with heparin Pitkin which was discontinued because of hæmaturia. Patient eventually died after massive pulmonary embolism

As the result of experience we adopted the custom of prescribing a dose of 400 mg if the coagulation time was less than 15 minutes, and 200 mg if it was 15–30 minutes, and we usually withheld the next dose if the coagulation-time was more than 30 minutes

The time required to produce an effective coagulation time after a single injection of heparin/Pitkin was very variable but never less than six hours and in some cases it was twenty four hours, during which time a second injection had been given In view of this delay soluble heparin in addition was given initially in cases where an immediate increase in the coagulation time was urgently required It was found advisable, moreover, to initiate treatment with heparin/Pitkin with the smallest potentially effective dose (200 mg), since the sensitivity of each patient could not be predicted In case 7 the coagulation time of 6 minutes was not increased after 200 mg but rose to 60 minutes after a further 400 mg twelve hours later (fig 3) Probably variations in both heparin tolerance and rate of absorption influenced these results

Complications

In practically every case some bruising and tenderness developed at the injection site after each injection In 6 cases this local reaction was severe enough to stop the treatment In 1 further case (case 7, fig 3) hæmaturia occurred while the coagulation time was 34 minutes but

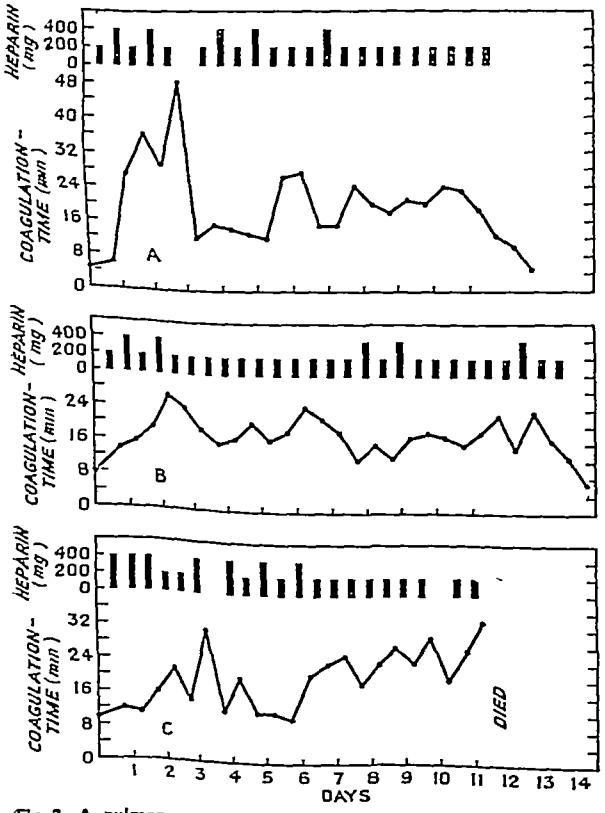

Fig 2—A pulmonary embolism in a man aged 63 (case 8) treated with heparin/Pitkin for 11 days showing how a transient fall in the mean coagulation-time can be boosted by an occasional injection at a higher dosage. Recovery B myocardial infarction in a man aged 62 (case 12) treated with heparin/Pitkin for 13 days. Recovery C myocardial infarction in a man aged 49 (case 14) treated with heparin/Pitkin for 11 days. Death followed further infarction.

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Attention is drawn to the danger of blood loss into injection sites and sudden release into the circulation of large amounts of heparin

Heparin/Pitkin is suitable for general use only if careful watch is kept for excessive local reactions and if the coagulation time is estimated every twenty four hours

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Further work is necessary to modify the menstruum so as to diminish local reactions and ensure more even absorption of heparin

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ACTIVITY OF HEPARIN IN PITKIN'S MENSTRUUM

J D MUIR
M.B Lpool, F R C S E
SENIOR SURGICAL OFFICER, ST JOHN'S HOSPITAL, CHELMSFORD

To delay the absorption of heparin, Loewe and Rosenblatt (1944) and Lange and Loewe (1946) gave it in Pitkin's menstruum by deep subcutaneous injection, and the effect of a single dose often lasted one to six days I have been unable to confirm their findings in a small series of cases, but the preparation is useful in thrombo embolic conditions requiring an anticoagulant

Pitkin's menstruum is a mixture of gelatin, glucose, acetic acid, and water, solid at room temperature but readily melted by warming to 45–50°C The menstruum is made up in 2 ml. ampoules already incorporated with 200 mg (200,000 I U) of heparin It is readily administered by warming the ampoule and drawing the contents into a warm dry syringe immediately before the injection, which is given deeply into the subcutaneous tissues

Before the preparation was used clinically its action was assessed on volunteers, heparin activity being determined by repeated estimations of coagulation time These were done by placing 1 ml of blood, obtained by clean venepuncture, in a test tube of 8 mm diameter and inverting it every half-minute The coagulation time is taken when the blood clots to such an extent that on inversion it remains at the end of the tube or falls en masse, the normal is 3–10 minutes From its withdrawal the blood must not be agitated

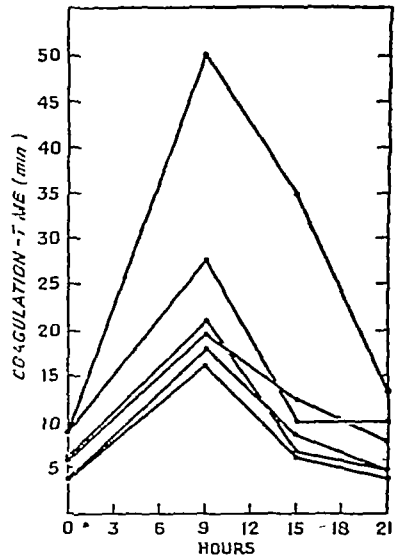


Fig 1—Effect of heparin 300 mg in Pitkin's menstruum on coagulation time in six healthy volunteers

PRELIMINARY INVESTIGATION

The optimal preliminary dose is usually 200–400 mg of heparin In six volunteers 300 mg of heparin in Pitkin's menstruum was given by deep subcutaneous injection and the coagulation times were taken after nine, fifteen, and twenty one hours (fig 1) The 9 hour coagulation-time was prolonged to 15–30 minutes in five of the cases, but in the sixth the effect was much greater and lasted up to twenty one hours Slight discomfort was felt at the site of the injection, but no untoward reactions occurred

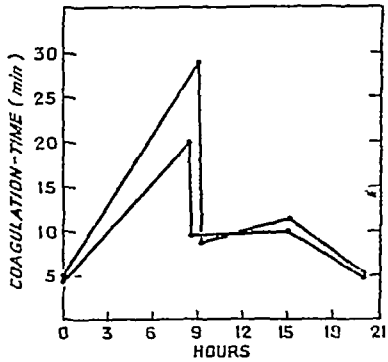
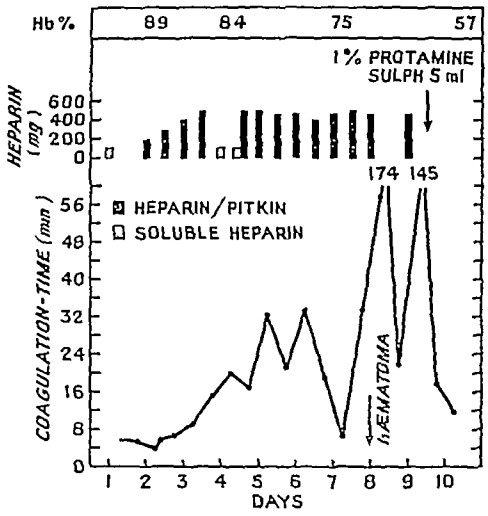


Fig 2—Effect of protamine sulphate on activity of heparin

Since anticoagulant drugs are potentially dangerous the effectiveness of protamine sulphate as an antidote was next investigated In two other volunteers, when a satisfactory response had been obtained, 10 ml. of 1% protamine sulphate solution was injected intravenously and the coagulation time determined five minutes later In both cases the coagulation time fell sharply (fig 2) This effect would probably not last long enough to

COAGULATION TIMES AFTER AN INITIAL DOSE OF HEPARIN 400 MG AND THE CONTINUATION DOSAGES

Diagnosis	Age (years)	Sex	Coagulation time (min)					Subsequent dosage (mg)		
			Initial	6 hr	12 hr	18 hr	24 hr	12 hr	24 hr	Continuation
Iliac embolus	32	F	8	25	15	27	14	200	200	200 b d
Femoral embolus	69	F	5	50	40	25	18	Nil	200	200/day
Venous thrombosis	52	M	6	18	10	25	12	400	400	400 b d
Pulmonary embolus	32	M	4	24	12	30	16	400	400	400 b d
Femoral embolus	71	M	5	24	16	25	14	200	200	200 b d
Venous thrombosis	36	F	8	16	12	20	14	400	400	400 b d
Venous thrombosis	72	F	4	40	25	18	11	Nil	400	400/day
Venous thrombosis	38	F	6	24	12	27	14	400	400	400 b d
Iliac embolus	27	M	7	18	11	20	12	400	400	400 b d
Venous thrombosis	58	M	4	20	12	25	13	400	400	400 b d



-Phlebothrombosis and pulmonary emboli in a man aged 48 9) showing sudden rise in coagulation time consequent on se of heparin from a large hæmatoma. Treatment discontinued very

was no local hæmatoma The severe local reactions the form of large hæmatomata in 3 cases (cases 6, 23), and gross painful swelling of the thigh asso- with pyrexia and leucocytosis in 2 cases (cases 19 20) Case 20 developed profuse proteinuria for y four hours, but there was no hæmaturia and no ise in the amount of hæmoglobin These systemic ons were not due to sensitivity to heparin, since patients subsequently received intravenous soluble n without untoward effect Severe local discomfort it obvious cause led to stopping of the treatment in 2 after the dosage had been raised

al bleeding at the site of the injection, with sudden into the circulation of large amounts of heparin esultant severe blood loss into the site, developed es 6 and 9 In case 9 (fig 4) the Hb level fell from to 57% and the coagulation time rose from 34 es to 174 minutes after the hæmatoma had red The next dose of heparin was omitted, and the ation time fell to 22 minutes The final dose of n/Pitkin should probably have been omitted, the coagulation time rose from 22 to 145 minutes w of the fall of the Hb level 5 ml of 1% protamine te was given intravenously, and the coagulation hen fell to 10 minutes In case 7 (fig 3), although was no hæmatoma, the injections were given oo small an area, and so a large quantity of n may have been released suddenly into the tion

rt from these 7 cases in which local or systemic ns or hæmaturia led to immediate stopping of the ent, it was discontinued in another patient 24), who was very sensitive to small doses and in it was felt that more reliable control would be ed with intravenous heparin In most, but not all, remaining cases local transient discomfort was nt to excite comment from the patient but not to stop treatment

incidence and severity of local reactions were in of those described by workers in the United States, sed heparin/Pitkin manufactured by William R r and Co Inc , and apparently identical with that ed by Boots Pure Drug Co and used by us In ries 6 patients died 2 from repeated pulmonary (cases 7 and 22), 2 from myocardial infarction 6 and 14), and 2 from congestive heart failure 17 and 23) With the above mentioned exceptions were no other untoward events, and no deaths ed as a result of heparin/Pitkin treatment In those who died as the result of further thrombo embolic phenomena the coagulation times were adequately prolonged, and no ante mortem mural thrombi were found in the hearts of the 2 patients who had fatal myocardial infarction

CONCLUSIONS

Intramuscular heparin/Pitkin 200–400 mg twelve hourly causes satisfactory lengthening of the coagulation time and is a simple and relatively safe anticoagulant, obviating the need for continuous or discontinuous intravenous administration of soluble heparin There is a latent period of at least six hours before heparin/Pitkin takes effect , and, if immediate prolongation of the coagulation time is required, intravenous heparin must be given initially in addition The coagulation time fluctu ates considerably from day to day in the same patient, and there is a great individual variation in the degree of tolerance to this, as to other forms of heparin The rate of absorption is irregular, and the dosage required cannot be accurately predicted beforehand Heparin/Pitkin should not, therefore, be used unless there are adequate facilities for estimating the coagulation time, and it is unsuitable for domiciliary use except in very exceptional circumstances

The severity of the local reactions and the tendency to extensive bleeding into the injection site are serious disadvantages Although heparin/Pitkin is undoubtedly effective and a promising anticoagulant, it is doubtful whether its general use is practicable until the menstruum has been suitably modified, especially as regards the production of a preparation with an optimal pH, and further work to this end is necessary In the meantime cases may be treated cautiously with an initial minimal effective dose (200 mg twelve hourly), therapy being discontinued at once in the event of more than slight local swelling, a hæmatoma, or a fall in the Hb level Fresh blood for transfusion and protamine sulphate should be available Coagulation times should be estimated at least once every forty eight hours It must be remem bered that, since heparin in this form can be rapidly neutralised by protamine and/or blood transfusion, the risk is minimal, provided that careful watch is kept on the injection sites

The effective dose of heparin/Pitkin (200–400 mg twelve hourly) is in excess of that used by Loewe and Eiber (1949), who found 400 mg every forty eight hours to be adequate and produced consistent and predictable response from a given dose and procured satisfactory coagulation times 1 or 2 hours after a single injection

SUMMARY

24 patients with thrombo embolic disease were treated with heparin dissolved in Pitkin's menstruum to retard absorption

Satisfactory lengthening of the coagulation time was obtained in all except 3 cases

Wide variations in coagulation times occurred from patient to patient, and in the same patient from day to day after a standard dose This was attributed to differ ences in rate of absorption, and to individual variations in sensitivity to heparin

The minimal effective dose was 200 mg twelve hourly, and the average was 200 mg alternating with 400 mg twelve hourly (600 mg a day)

A latent period of at least 6–48 hours occurred before adequate clotting times were obtained

Intravenous soluble heparin was required in addition when an immediate anticoagulant effect was required.

Most patients developed some pain at the injection sites, and in 6 cases these local reactions were severe consisting of large hæmatomata in 3 patients and inflammatory reactions in 3

Attention is drawn to the danger of blood loss into injection sites and sudden release into the circulation of large amounts of heparin

Heparin/Pitkin is suitable for general use only if careful watch is kept for excessive local reactions and if the coagulation time is estimated every twenty four hours

In patients who have no more than mild local reactions, the menstruum is a satisfactory and convenient medium for anticoagulant therapy and has many advantages over intravenous soluble heparin and dicoumarol

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SENIOR SURGICAL OFFICER ST JOHN'S HOSPITAL, CHELMSFORD

To delay the absorption of heparin, Loewe and Rosenblatt (1944) and Lange and Loewe (1946) gave it in Pitkin's menstruum by deep subcutaneous injection, and the effect of a single dose often lasted one to six days I have been unable to confirm their findings in a small series of cases, but the preparation is useful in thrombo embolic conditions requiring an anticoagulant

Pitkin's menstruum is a mixture of gelatin, glucose, acetic acid, and water, solid at room temperature but readily melted by warming to 45–50°C The menstruum is made up in 2 ml. ampoules already incorporated with 200 mg (200 000 I U) of heparin It is readily administered by warming the ampoule and drawing the contents into a warm dry syringe immediately before the injection, which is given deeply into the subcutaneous tissues

Before the preparation was used clinically its action was assessed on volunteers, heparin activity being determined by repeated estimations of coagulation time These were done by placing 1 ml. of blood, obtained by clean venepuncture, in a test-tube of 8 mm diameter and inverting it every half-minute The coagulation time is taken when the blood clots to such an extent that on inversion it remains at the end of the tube or falls en masse, the normal is 3–10 minutes From its withdrawal the blood must not be agitated

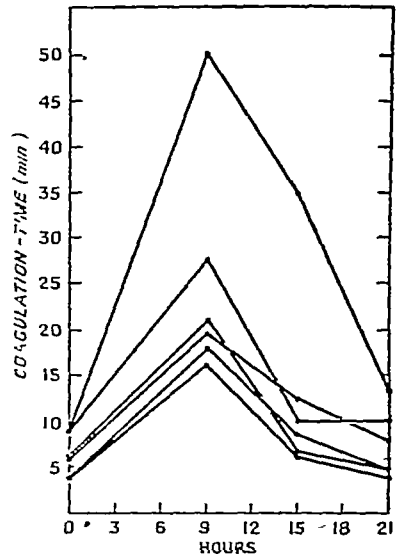

Fig 1—Effect of heparin 300 mg in Pitkin's menstruum on coagulation time in six healthy volunteers

PRELIMINARY INVESTIGATION

The optimal preliminary dose is usually 200–400 mg of heparin In six volunteers 300 mg of heparin in Pitkin's menstruum was given by deep subcutaneous injection and the coagulation times were taken after nine, fifteen, and twenty one hours (fig 1) The 9 hour coagulation-time was prolonged to 15–30 minutes in five of the cases, but in the sixth the effect was much greater and lasted up to twenty-one hours Slight discomfort was felt at the site of the injection, but no untoward reactions occurred

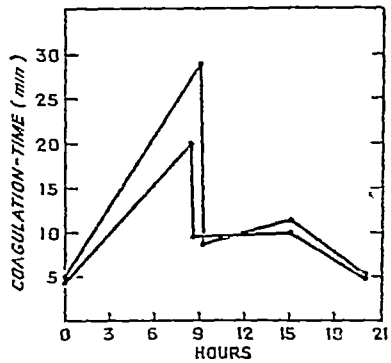

Fig 2—Effect of protamine sulphate on activity of heparin.

Since anticoagulant drugs are potentially dangerous the effectiveness of protamine sulphate as an antidote was next investigated In two other volunteers, when a satisfactory response had been obtained, 10 ml. of 1% protamine sulphate solution was injected intravenously and the coagulation time determined five minutes later In both cases the coagulation time fell sharply (fig 2) This effect would probably not last long enough to

COAGULATION TIMES AFTER AN INITIAL DOSE OF HEPARIN 400 MG AND THE CONTINUATION DOSAGES

Diagnosis	Age (years)	Sex	Coagulation time (min)					Subsequent dosage (mg)		
			Initial	6 hr	12 hr	18 hr	24 hr	12 hr	24 hr	Continuation
Iliac embolus	32	F	8	25	15	27	14	200	200	200 b d
Femoral embolus	60	F	5	50	40	25	18	Nil	200	200/day
Venous thrombosis	52	M	6	18	10	25	12	400	400	400 b d
Pulmonary embolus	32	M	4	24	12	30	16	400	400	400 b d
Femoral embolus	71	M	5	24	16	25	14	200	200	200 b d
Venous thrombosis	36	F	8	16	12	20	14	400	400	400 b d
Venous thrombosis	72	F	4	40	25	18	11	Nil	400	400/day
Venous thrombosis	38	F	6	24	12	27	14	400	400	400 b d
Iliac embolus	27	M	7	18	11	20	12	400	400	400 b d
Venous thrombosis	58	M	4	20	12	25	13	400	400	400 b d

counteract the heparin released from the subcutaneous deposit some hours later, but it was reassuring to know that a rising coagulation time could easily be controlled The value of protamine in this respect is in striking contrast to the unreliability of the antidotes used against the dicoumarol type of drugs Other methods of controlling a rising coagulation time—e g, by applying a light tourniquet proximal to the injection, and by applying ice bags to resolidify the deposit of heparin —were not investigated

CLINICAL APPLICATION

When an anticoagulant is required the need is urgent and a rapid effect is best obtained by injecting 8000–10,000 I U of aqueous heparin intravenously, and 300–400 mg of heparin/Pitkin subcutaneously A further dose of aqueous heparin may be required after three hours if a low coagulation time reveals that absorption of heparin from the Pitkin's menstruum has not yet become effective At the end of twelve hours the patient's response to heparin can be accurately assessed

In a few cases heparin/Pitkin was given as the sole anticoagulant, its effect being controlled by determining the coagulation time every six hours for the first twenty four hours (see table)

All the cases were given an initial dose of 400 mg of heparin/Pitkin, and at the end of twelve hours a decision was made on further dosage As a working rule, after twelve hours the initial dose was repeated if the coagulation time was less than double, and half this dose was given if it was between two and three times the initial coagulation time After twenty four hours the dosage was reviewed again in the same way

As will be seen from the table, a single dose of heparin/Pitkin did not produce a satisfactory response for longer than twenty four hours At the end of this time the dosage could be satisfactorily judged, so coagulation times were determined at twelve or twenty four hours according to the estimated frequency of dosage

Treatment was continued for five to ten days, and none of the patients needed any change in dosage after the first day

DISCUSSION

In many quarters dicoumarol and allied drugs are falling into disfavour because of the difficulties encountered in estimating dosage in relation to the prothrombin level The frequent intravenous injection of heparin is the safest and most popular anticoagulant method, but unless the injections are given three hourly the coagulation time cannot be kept at a suitably raised level Nevertheless, from the point of view of simplicity, there is a place in clinical practice for a long-acting anticoagulant with a wide margin of safety and easy to control Heparin/Pitkin seems to be a step towards this ideal anticoagulant, although it is disappointing that the earlier reports on its activity have not been sustained However, further experience in making up the preparation may lead to improvement in this respect

SUMMARY

By administering heparin in Pitkin's menstruum (an aqueous solution of gelatin, glucose, and acetic acid) the effect of a single deep subcutaneous injection can be made to last 12–24 hours The release and effect of heparin can be controlled if necessary with intravenous protamine sulphate

A satisfactory clinical response has been obtained in suitable cases

I wish to thank Dr J P Whitehead for his help with the laboratory investigations and Messrs Boots Pure Drug Co for supplying the heparin in Pitkin's menstruum ('Heparin retard')

REFERENCES

Lange K Loewe L (1946) *Surg Gynec Obstet* 82, 256
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TREATMENT OF DEAFNESS AND RECURRENT OTITIS MEDIA WITH X RAYS

H S KANDER
F R C S
CONSULTANT EAR, NOSE, AND THROAT SURGEON

K SICHER
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COVENTRY AND WARWICKSHIRE HOSPITAL

It has long been recognised that lymphoid tissue in the nasopharynx, particularly round the orifice of the eustachian tubes and in Rosenmueller's fossa interferes with the ventilation of the middle ear and often impairs hearing Hence the satisfactory results obtained by surgical removal of adenoids in many children with defective hearing In a substantial proportion of cases, however, the deafness persists or recurs, or acute otitis media—catarrhal or suppurative—returns repeatedly, in spite of thorough curettage of the adenoid tissue Such failures are due not only to the notorious tendency of adenoid tissue to re form, but also to the fact that it is often inaccessible in the place where its removal is most necessary—namely, at the orifice and in the lumen of the tube itself

Fortunately lymphoid tissue is radiosensitive, and attempts have therefore been made to reduce excessive lymphoid tissue in the nasopharynx by irradiation

Crowe and his co workers (1938, 1939, 1941) introduced radium or radon applicators through the nose and placed them against the orifice of the eustachian tubes The 'Monel' metal applicators containing 50 mg of radium are inserted for twelve minutes every two weeks for three or more treatments Fowler (1946), who also uses this treatment for otitic barotrauma, employs a similar applicator with a platinum wall, which has to be left in position for about forty minutes

Desjardins (1931, 1932) reviewing the literature concluded that X rays influence tinnitus and improve hearing in some cases O Brien (1937) treated 140 patients between 1929 and 1935 and found that 73 had improved hearing, 65 were unchanged, and 2 were worse Rentschler and Settle (1944) describe the technique they employed in 19 patients who had deafness and middle ear disease, using a total of 800 r 15 of their patients were improved and 8 had their hearing restored to normal Hawley (1944) reports 18 cases with impaired hearing, of which 17 showed improvement audiometrically Young and Woutat (1948) review the literature and give their experience with deep X ray therapy in 116 cases They consider it the treatment of choice for chronic middle ear infection with lymphoid infiltration of the eustachian tubes, and in cases of deafness associated with excessive lymphoid tissue, and recurrent otitis media They observed no damage to surrounding structures

In the United States irradiation by radium or radon applicators is now widely practised and has become standardised In this country this method is now being tried When we considered irradiation treatment nearly three years ago radium applicators were not available to us, and we therefore started the less popular method of treatment by deep X rays Impressed by the good results in our early cases we pursued this method It seemed to us that the repeated insertion of applicators into the nose must be an unpleasant procedure, and in children it often requires general anæsthesia We did not think this justifiable if the same results could be obtained by an easier method

In our experience it has not been difficult to treat even nervous children by X rays Apart from 2 cases which developed mild parotitis lasting a few days, our patients have had no side effects (It should be noted, however, that the dose given may cause temporary depilation over the temples, unless the hairy part of the scalp is screened with lead rubber) No skin erythema has been seen, and no complaints of dryness of the throat have been made One child treated for recurrent otitis media and deafness had an acute attack of otitis media

three weeks after treatment, but we have no evidence that the irradiation was a contributing factor

Fowler (1947), one of the advocates of the radium method, admits that comparable results can be obtained by deep X-ray therapy His objections to it are the possibility of flare ups of otitis media, occasional parotitis, and the need for cumbersome and expensive equipment and the services of a radiotherapist In view of the availability of deep X ray equipment in most large hospitals the last argument is scarcely valid In any case we feel that the supervision of a radiotherapist is essential in any form of radiotherapy Fowler also states that where lymphoid tissue grows excessively, and radiotherapy by radium or radon to the mouth of the tube is unsuccessful, deep X ray therapy may be required to shrink it

Dickson and McGibbon (1949) writing on the treatment of otitic barotrauma, strongly prefer deep X rays to radium, which they regard as dangerous in the dosage which would be needed for irradiation of the entire eustachian tube

SELECTION OF CASES

The correct selection of cases for radiotherapy is of great importance On routine examination of a large number of children Crowe found that the first indication of hearing loss due to excessive lymphoid tissue is impairment of hearing of very high tones, well above the speech range and in the neighbourhood of 16,000 d v.s. (double vibrations per sec) This hearing loss may be caused by lesions other than tubal occlusion but he advises treatment prophylactically if the nasopharynx is not completely normal The best results from radiotherapy were obtained, however, in cases in which

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—	Total	Improvement		No change	% improved
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It is clear that early treatment is imperative if permanent changes—e g adhesions in the middle ear and marked retraction of the tympanic membranes—are to be prevented Once these changes have occurred the process is irreversible and may even progress It is therefore of utmost importance that a suspicion of deafness by parents or teachers should be taken seriously All these cases should be investigated thoroughly and referred to an otologist, who should look for aural, nasopharyngeal, or nasal abnormality Hearing tests with the audiometer and spoken voice may have to be made repeatedly before any objective evidence of deafness can be obtained In many cases removal of tonsils and adenoids will have to be the first therapeutic measure but often these have already been removed When after careful operative removal marked lymphoid enlargement is present, especially on the posterior pharyngeal wall and in the nasopharynx, and in patients who give a history of frequent colds earache, or recurrent otitis media hearing should be assessed carefully Occasionally one sees cases in which a large pad of adenoids has recurred. This should be removed surgically, because great shrinkage may not take place with the dosage of X rays used.

To avoid disappointments the selection of cases for radiotherapy should be narrowed down to those fulfilling certain criteria Our two main groups were children suffering from deafness and those suffering from recurrent attacks of otitis media All these children treated by deep X rays had had their tonsils and adenoids removed —almost all of them long before they were referred to us for deafness, &c. Excessive lymphoid tissue was present either in the postnasal space or around the openings of the eustachian tubes In some children we were unable to see the postnasal space by mirror examination, and in those the lymphatic nodules on the posterior pharyngeal wall were conspicuous, or there was enlargement of the lateral pharyngeal bands, two red bands of lymphoid tissue just behind the posterior tonsillar pillars The tympanic membranes were usually retracted or had lost some of their lustre, both in our deafness cases and in those suffering from attacks of acute otitis media with or without discharge

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One patient had an anterior perforation of the tympanic membrane with a chronic discharge In all but 3 of our cases audiograms were taken before and after treatment, and, though we did not find a drop at the 16,000 d v s level, which Crowe considered of such significance, some hearing loss could be demonstrated audiometrically in all our deafness cases In some this loss was only slight and in the neighbourhood of 15–20 decibels but treatment was nevertheless given when the other criteria were present as well

Though we regarded the audiometric testing as a valuable scientific means of assessing hearing loss, we fully recognise that it is only partially reliable Tests often take a considerable time, and fatigue and the temperament of the child may influence the result and value of the test Therefore information from the parents about their child's hearing is of great importance

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TABLE III—FREQUENT COLDS AND NASAL OBSTRUCTION BY LYMPHOID TISSUE RESULTS OF TREATMENT

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The patient lies supine with the head turned to one side with the central beam at right angles to the plane

of the area to be treated An experienced radiographer will have no difficulty in handling a child

RESULTS

The total number of cases treated by deep X rays was 41 in a period of twenty seven months Cases which were followed up for less than five months are not included in this series The average follow up period was thirteen months There were 22 male and 19 females 39 were children from the age of four to thirteen years and the 2 other patients were seventeen and twenty six

To assess the response we divided our cases into three groups

1 Patients who had hearing loss (deafness)
2 Patients with recurrent otitis media with or without suppuration (This group also included a patient with chronic suppurative otitis media with an anterior perforation due to eustachian infection.)
3 Children with frequent colds and nasal obstruction

Several of the cases belonged to more than one group—e g , a patient may have recurrent attacks of otitis media with loss of hearing

Deafness

The response to treatment is assessed (1) symptomatically and clinically, and (2) audiometrically "Symptomatic and clinical improvement" is judged by the impression of parents or teachers, improvement in school work, and our own observation The impairment of hearing as shown by audiometer was divided into three degrees

1 Marked more than 20 decibels
2 Slight under 20 decibels
3 No change or worse

To assess the audiometric improvement we took the readings of a corresponding frequency at the point of the greatest loss The results are shown in table I

In 3 cases audiograms were not taken and in 1 case they were unreliable because the child was too vague Of these 4, 3 showed considerable symptomatic and clinical improvement

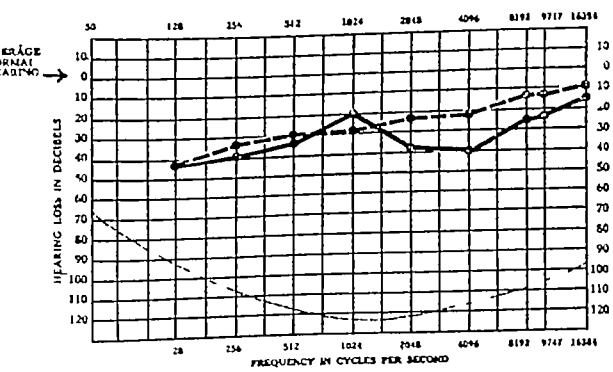

Fig 1 (case 1)—Audiogram on Sept. 15 1948

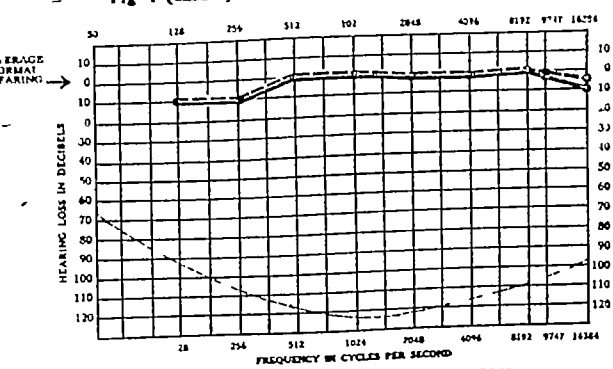

Fig 2 (case 1)—Audiogram on March 30, 1949

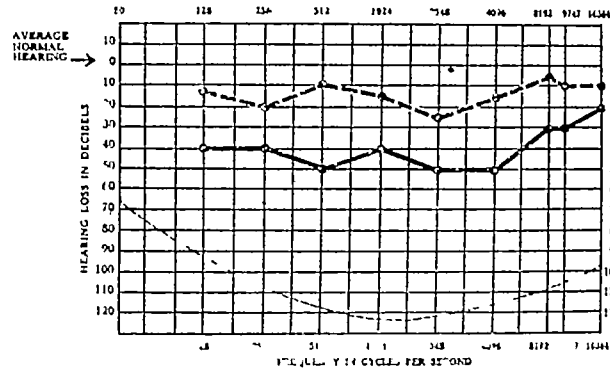

Fig 3 (case 2)—Audiogram on Sept. 29, 1948

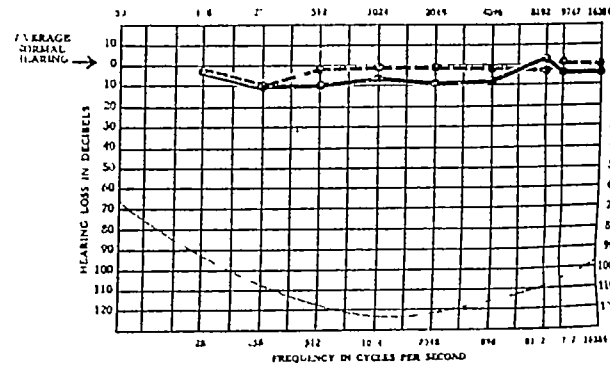

Fig 4 (case 2)—Audiogram on June 9, 1949

Some of the patients had only slight hearing loss audiometrically and their hearing became normal after treatment But as the improvement was less than 20 decibels these cases are classified as showing slight improvement

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Case 2 —Girl aged 6 Had tonsils and adenoids removed in 1947 Seen again in September, 1948, because of recurrent attacks of earache and otorrhœa, usually from the right ear, but also from the left Last attack of acute otitis media in July, 1948 On examination some lymphoid follicles were present on the posterior pharyngeal wall The right tympanic membrane was retracted and scarred, the left slightly retracted The Rinné test was negative in both ears Whispered voice heard from about 2 ft in both ears An audiogram taken on Sept 29 showed marked hearing loss in the right ear, in the left ear hearing was moderately reduced (fig 3) X ray therapy was started immediately An audiogram taken on Jan 23 1949, showed only 10 decibels loss in both ears On June 9, 1949, her audiogram was normal (fig 4) Whispered voice could be heard from 12 ft without difficulty Rinne was positive The tympanic membranes were still retracted but there had been no earache or otorrhœa since treatment Improvement has since been maintained

Recurrent and Chronic Otitis Media

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SUMMARY AND CONCLUSION

Over a period of two years, 41 cases with hypertrophy of lymphoid tissue in the nasopharynx have had deep X ray therapy

The results were encouraging Final conclusions cannot yet be drawn, but we are convinced that deep X ray therapy has a definite place in the treatment of selected cases of deafness and recurrent otitis media

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DEHYDRATION TREATMENT OF RHEUMATIC FEVER

W S C COPEMAN
O.B E, M.A., M D Camb, F R C P
PHYSICIAN TO RHEUMATISM DEPARTMENT, WEST LONDON HOSPITAL

L G C E PUGH
M.A. B M Oxfd
MEDICAL REGISTRAR POSTGRADUATE MEDICAL SCHOOL OF LONDON

THE mode of action of salicylates has been investigated by Reid et al (1950), who suggest that the reduction of fever and tachycardia, together with the relief of pain and swelling in the affected joints during the first five days' therapy, can be attributed to a reduction in the water content of the body cells (dehydration) If similar clinical results were obtainable as the result of cellular dehydration brought about by another method, the basis of this hypothesis would be strengthened

We treated 7 cases of rheumatic fever by reducing the total water content of the body and following this with a rapid intravenous injection of hypertonic saline solution to displace water from the intracellular to the extracellular fluid compartment of the body We reported our results (1945) but did not at that time describe them in full

The effect of this treatment on the patients was clinically comparable with that described by Reid et al in their cases treated with large doses of salicylates, and the side effects in our series were also strikingly similar to those which they report

METHOD

The 7 patients treated were young soldiers serving with the B L A All food and water were withheld from these patients for thirty six hours Six doses of sodium sulphate 1/2 oz were administered during this period The resultant reduction in body water, estimated by loss of body-weight, amounted to 2 or 3 litres At the end of this period 50 ml. of a 30% solution of sodium chloride (15 g) was injected intravenously in about 30 sec The shift of water from the cells thus produced was calculated to be about 1 litre (Gamble 1942) A cup of tea was allowed during the next four hours to mitigate thirst The doses of sodium sulphate were continued two hourly for a further twelve hours Twenty four hours after the injection of sodium chloride, restriction of fluid and food was relaxed.

RESULTS

No clinical effects other than thirst and diarrhœa were observed during the preliminary period of dehydration Within twenty four hours after the injection of sodium chloride there were relief of pain on movement, reduction of tenderness and swelling of the affected joints, and a fall of temperature and pulse rate Side effects, such as hyperpnœa, nausea, vomiting, and tingling of the extremities, developed in four cases, and drowsiness was observed in all but one The erythrocyte sedimentation rate (E S R) repeated three days after the injection of saline solution showed no significant change Abstracts of the case-histories are given below

Case 1 —A soldier, aged 24, had had painful and swollen wrists and knees for a week His temperature was 100°F, and pulse rate 100 Twelve hours after injection his temperature dropped to normal and remained so and his pulse rate to 70 He made an uneventful recovery without further involvement of his joints

Case 2 —A soldier aged 25, had had, three days previously while in hospital for hernia, polyarticular pain and swelling, temperature 104 2°F, and pulse rate 110 He seemed very ill Within twenty four hours of injection all joint pain and swelling had gone, temperature 100°F, pulse rate 100 He still felt ill After another twelve hours his left knee swelled again and some drowsiness hyperpnœa, and nausea developed There was no further rise in temperature or pulse rate

Case 3 —A soldier, aged 27 had had a first attack of rheumatic fever at the age of 12 years, and relapses on several occasions subsequently, generally lasting about three weeks The present relapse had occurred three days previously His temperature on admission was 101°F but fell to 100°F pulse rate 102 Twelve hours after injection his temperature was unchanged pulse rate 70 and all joint pain and swelling had disappeared Twelve hours later his pulse rate had dropped to 50

Case 4 —A soldier aged 23 had had an attack of acute rheumatic fever a week previously There was some evidence of early carditis The patient was obviously ill with temperature 103 7°F and pulse rate 112 Twenty four hours after injection joint pains and swelling very much relieved temperature remained around 100°F pulse dropped to 80–90, but the patient still felt ill and started to vomit

Case 5 —A soldier aged 24, was in tenth day of the fourth attack of rheumatic fever since childhood He did not feel very ill, but his knees, wrists and ankles were very swollen and painful His temperature was 102°F, and pulse rate 90 Twenty four hours after injection his temperature was 99°F and pulse rate 75, the pain and swelling were minimal and there were tingling of extremities and nausea The patient relapsed to his original condition after cessation of treatment

Case 6 —A soldier, aged 21 was in seventh day of a first attack of rheumatic fever of moderate severity His temperature was 101°F and pulse-rate 100 Twenty four hours after injection his temperature was 97°F, and pulse rate 68 From this time he made an uneventful recovery with no further pyrexia or joint swelling

of the area to be treated An experienced radiographer will have no difficulty in handling a child

RESULTS

The total number of cases treated by deep X rays was 41 in a period of twenty seven months Cases which were followed up for less than five months are not included in this series The average follow up period was thirteen months There were 22 male and 19 females 39 were children from the age of four to thirteen years and the 2 other patients were seventeen and twenty six

To assess the response we divided our cases into three groups

1 Patients who had hearing loss (deafness)
2 Patients with recurrent otitis media with or without suppuration (This group also included a patient with chronic suppurative otitis media with an anterior perforation due to eustachian infection)
3 Children with frequent colds and nasal obstruction

Several of the cases belonged to more than one group—e g, a patient may have recurrent attacks of otitis media with loss of hearing

Deafness

The response to treatment is assessed (1) symptomatically and clinically, and (2) audiometrically "Symptomatic and clinical improvement" is judged by the impression of parents or teachers, improvement in school work, and our own observation The impairment of hearing as shown by audiometer was divided into three degrees

1 Marked more than 20 decibels
2 Slight under 20 decibels
3 No change or worse

To assess the audiometric improvement we took the readings of a corresponding frequency at the point of the greatest loss The results are shown in table I

In 3 cases audiograms were not taken and in 1 case they were unreliable because the child was too vague Of these 4, 3 showed considerable symptomatic and clinical improvement

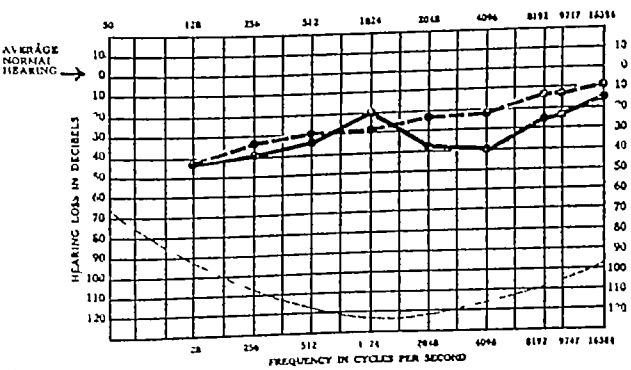


Fig 1 (case I)—Audiogram on Sept. 15, 1948

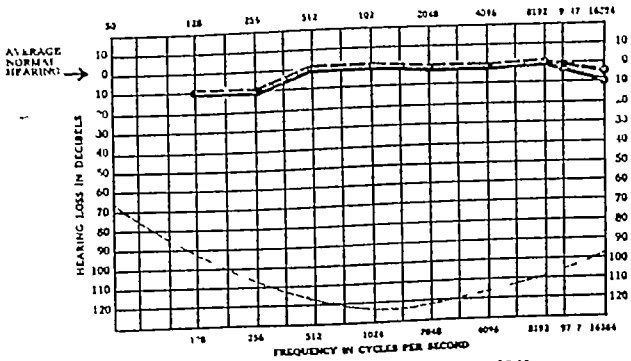
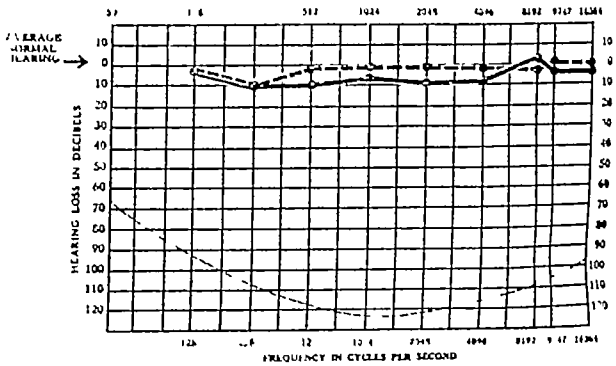


Fig 2 (case I)—Audiogram on March 30 1949

Fig 3 (case 2)—Audiogram on Sept. 29, 1948



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Case 7 —A soldier, aged 25, was seen on the fourth day of an attack of rheumatic fever of moderate severity His temperature was 100 8°F, and pulse rate 100 He felt ill, and many joints were very painful and swollen Twenty four hours after injection joint pain and swelling had practically subsided, temperature was 98°F, and pulse rate 72 Shortly afterwards the patient developed mild "air hunger," with deep slow sighing respirations and slight nausea He did not subsequently relapse

DISCUSSION

The clinical picture observed in these cases is comparable with that described by Reid et al (1950) as developing in their series about the fifth day of massive salicylate therapy Hyperpnœa, nausea, vomiting, and drowsiness were features of both series of cases, in neither was an early change in E S R found The chief points in which the two series differ are the intense thirst and tingling of the extremities in our cases, and the well known tinnitus and deafness of salicylism in the cases of Reid et al

Although Reid et al attribute the reduction of symptoms to the change in fluid distribution within the body, this phenomenon is but one of several complex changes, and possibly the symptomatic relief may be due to some other, as yet undefined, cause Similarly the reduction of symptoms in our cases may be due to factors other than the alteration in the volume and distribution of body fluids, such, for instance, as a non specific stimulation of the adrenal cortex

No claim is therefore made that the factor of cellular dehydration common to both groups is necessarily the cause of the rapid reduction in symptoms The object of this note is merely to place on record the similarity of the clinical effects in acute rheumatism treated with massive salicylate therapy and in acute rheumatism treated by dehydration induced more directly by another method

SUMMARY

Seven cases of rheumatic fever were treated by intracellular dehydration

The clinical effects were strikingly similar to those reported with massive salicylate therapy

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EFFECTS OF PRISCOL ON THE PERIPHERAL CIRCULATION

R B LYNN
M D Queen s Univ, Ont, F R C S
From the Surgical Laboratories of the Postgraduate Medical School of London

OF the many chemical compounds recommended for the treatment of peripheral vascular disease few have stood the test of time and critical clinical investigation 'Priscol' (benzyl imidazoline), one of the more recent vasodilator drugs, has been reported on favourably by Bürklen (1940) and Lindquist (1943) on the Continent, by Grimson et al (1948a and b) in the U S A, and by Douthwaite and Finnegan (1950) in this country Ahlquist et al (1947) and Chess and Yonkman (1946) have shown, in experiments on animals, its sympatholytic and adrenolytic actions, its effect on the cardiac output, and its vasodilator action on the limbs, and Winsor and Ottoman (1949) have confirmed its vasodilator action on the limbs in man The effects of priscol on the peripheral circulation in the limbs of 40 adults are reported here

METHOD AND RESULTS

The blood flow through the limbs of 30 patients (including 6 normal volunteers) was measured by a thermostatically controlled modification of the water filled venous occlusion plethysmograph (Barcroft and Edholm 1945) Fifty limbs were studied by this method

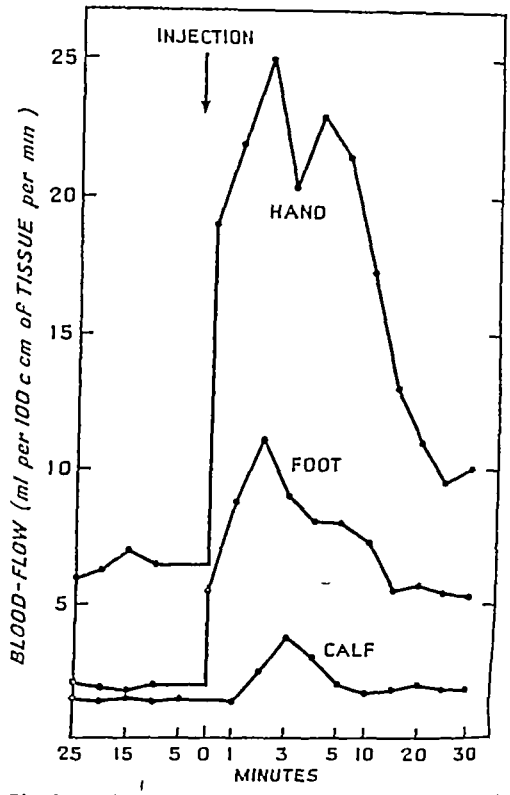

Fig 1—Blood flow in normal person after intravenous injection of priscol 50 mg (In all charts arrow indicates completion of injection)

In the 6 normal volunteers the intravenous injection of priscol 50 mg caused a pronounced increase in blood flow through the hands and feet and only a slight increase in the calf (fig 1) Priscol 50 mg injected into the femoral artery caused a maximal effect in the ipsilateral foot and only a slight increase in the blood flow through the contralateral foot (fig 2) This increase in blood flow was transient but was maintained in all cases above the pre existing level for the duration of the test but had returned to normal by the next day

In 3 sympathectomised patients (1 operated on for thromboangiitis obliterans, 1 for arteriosclerosis, and 1 for pernio) the intravenous injection of priscol 50 mg caused no appreciable change in blood flow through the feet (fig 3)

In 13 patients with vasospastic disorders of the limbs (Raynaud's disease 3, Raynaud's phenomenon 8, acrocyanosis 1, erythrocyanosis frigida 1) the intravenous injection of priscol caused an immediate increase in the blood flow in both the hands and the feet (fig 4) Ten of these patients received 150 mg of priscol by mouth daily for periods ranging from one to six months, and a definite clinical improvement was noted by both patient and observer in the 3 patients with Raynaud's disease and in 5 of the 8 patients with Raynaud's phenomenon One of the patients with Raynaud's phenomenon had previously had from one to three attacks of vasospasm every day, but after taking priscol by mouth for a month (March) had only one attack during the period of therapy One patient with Raynaud's phenomenon secondary to scleroderma, and another with Raynaud's phenomenon secondary to Pott's paraplegia, showed no improvement Four patients with persistent vasospasm after sympathectomy showed considerable improvement Of 4 patients with vasospastic disorders whose blood flows were estimated before and after the

administration of priscol by mouth for a month only one showed an increase in blood flow over the pre existing resting level.

In 17 patients with occlusive vascular disease (thrombo angiitis obliterans 2, arteriosclerosis 15) the intravenous injection of 50 mg of priscol was followed by an increase in blood flow in the feet (fig 5) In the calf the increase in blood flow was minimal and in some patients it was unchanged The injection of priscol 50 mg into the femoral artery was followed by an increase in blood-flow in the ipsilateral calf to double the pre existing level, apparently when priscol was given by this method the effect was more sustained (fig 6) Eight patients of this group received priscol 150 mg by mouth daily for a month, and in none of these was there any significant clinical improvement Claudication distance was not materially improved in any patient- Only grade 2

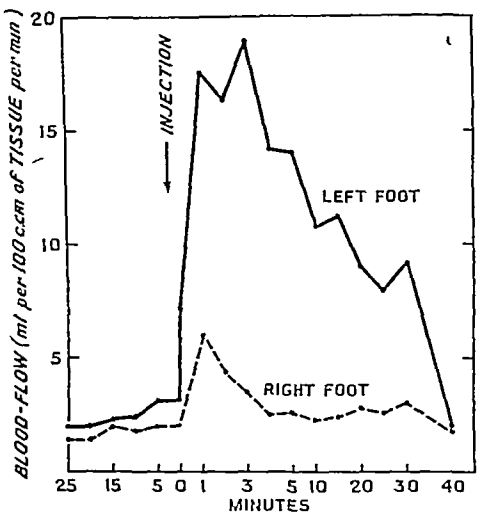

Fig 2—Blood flow in feet of normal person after injection of priscol 50 mg into right femoral artery

and grade 3 claudicants (Boyd et al 1949) were studied. The calf and foot blood flows were not increased over the pre existing levels in any of these patients

A patient with an acute embolism of the brachial artery was given 40 mg of priscol by injection into the subclavian artery an hour after the onset of symptoms The collateral circulation visibly improved immediately, and within two hours the paralysis and anæsthesia had disappeared and the hand was warm, though the radial pulse did not return until next day

In 3 patients a further degree of vasodilatation was obtained with 50 mg of priscol intravenously at the end of a reflex heating test

DISCUSSION

It has been found that intravenous priscol is a powerful vasodilator agent which acts particularly on the skin of the extremities Intra arterial injection of priscol does little more than double the blood flow through the muscle of the calf, and this increase accords with that obtained through muscle by other sympathetic blocking methods (Barcroft et al. 1943) The administration of 150 mg of priscol by mouth daily for a month or more has proved ineffective, judged by plethysmographic criteria It has been shown that a maximal effect is exerted on the ipsilateral limb when priscol is given by intra arterial injection, and that there is no increase in blood flow in sympathectomised limbs when priscol is given intravenously It can therefore be concluded that the vasodilatation results from a peripheral sympathetic blocking effect Its beneficial action

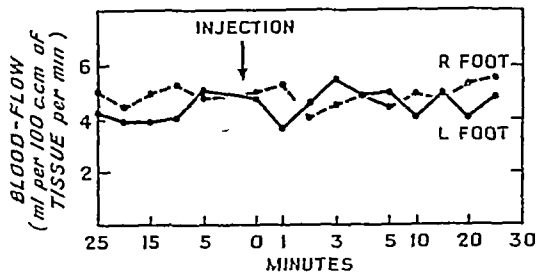

Fig 3—Blood flow in feet of sympathectomised patient after intravenous injection of priscol 50 mg

in vasospastic disorders—particularly in cases which relapse after sympathectomy of the upper limbs—may well be the result of this peripheral effect on regenerated sympathetic nerve fibres In the blood concentrations obtained with oral dosage it is not likely that the effect of the drug could be a local one on the blood vessels (see Addendum)

The clinical findings recorded here agree fairly well with those of Bürklen (1940), Grimson et al (1948a and b), and Lindquist (1943) Douthwaite and Finnegan (1950) reported improvement in patients with intermittent claudication, but this has not been confirmed in this department It is suggested that priscol will find its greatest use in vasospastic disorders of the upper limb, and perhaps particularly in cases which relapse after cervicodorsal sympathectomy Grimson (1950) contends that the immediate and late effects with priscol are as good as those which follow sympathectomy for Raynaud's disease, and some of his cases have now been followed for more than three years He seldom gives the drug to patients with arteriosclerosis or Buerger's disease, because the results are equivocal The value of intra arterial priscol in the conservative management of acute arterial embolism needs further confirmation It is as effective as a paravertebral block (Grimson et al 1948a) and may be used whenever vasodilatation of a limb is desired Intra arterial injection ensures a maximal effect in the ipsilateral limb, and the blood pressure is not lowered by the dosages used in this study Priscol may be of value in confirming the completeness of a reflex heating test and in determining suitable candidates for sympathectomy

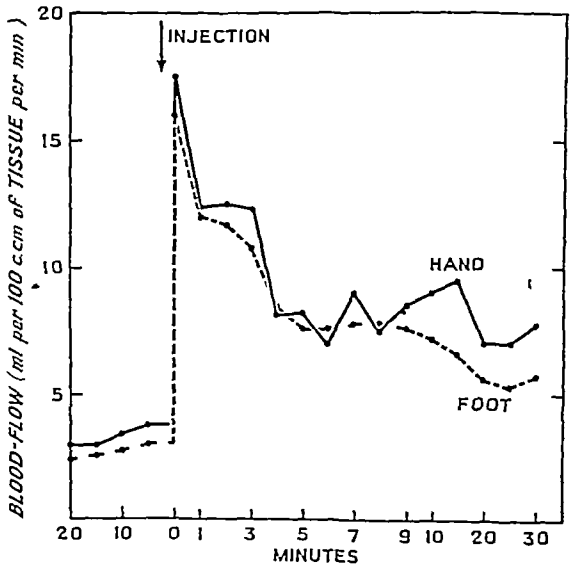

Fig 4—Blood flow in patient with Raynaud's phenomenon after intravenous injection of priscol 30 mg

Case 7 —A soldier, aged 25, was seen on the fourth day of an attack of rheumatic fever of moderate severity His temperature was 100 8°F, and pulse rate 100 He felt ill, and many joints were very painful and swollen Twenty four hours after injection joint pain and swelling had practically subsided, temperature was 98°F, and pulse rate 72 Shortly afterwards the patient developed mild "air hunger," with deep slow sighing respirations and slight nausea He did not subsequently relapse

DISCUSSION

The clinical picture observed in these cases is comparable with that described by Reid et al (1950) as developing in their series about the fifth day of massive salicylate therapy Hyperpnœa, nausea, vomiting, and drowsiness were features of both series of cases, in neither was an early change in E S R found The chief points in which the two series differ are the intense thirst and tingling of the extremities in our cases, and the well known tinnitus and deafness of salicylism in the cases of Reid et al

Although Reid et al attribute the reduction of symptoms to the change in fluid distribution within the body, this phenomenon is but one of several complex changes, and possibly the symptomatic relief may be due to some other, as yet undefined, cause Similarly the reduction of symptoms in our cases may be due to factors other than the alteration in the volume and distribution of body fluids, such, for instance, as a non specific stimulation of the adrenal cortex

No claim is therefore made that the factor of cellular dehydration common to both groups is necessarily the cause of the rapid reduction in symptoms The object of this note is merely to place on record the similarity of the clinical effects in acute rheumatism treated with massive salicylate therapy and in acute rheumatism treated by dehydration induced more directly by another method

SUMMARY

Seven cases of rheumatic fever were treated by intracellular dehydration

The clinical effects were strikingly similar to those reported with massive salicylate therapy

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EFFECTS OF PRISCOL ON THE PERIPHERAL CIRCULATION

R B LYNN
M.D Queen s Univ , Ont , F R C S
From the Surgical Laboratories of the Postgraduate Medical School of London

OF the many chemical compounds recommended for the treatment of peripheral vascular disease few have stood the test of time and critical clinical investigation 'Priscol' (benzyl imidazoline), one of the more recent vasodilator drugs, has been reported on favourably by Bürklen (1940) and Lindquist (1943) on the Continent, by Grimson et al (1948a and b) in the U S A , and by Douthwaite and Finnegan (1950) in this country Ahlquist et al (1947) and Chess and Yonkman (1946) have shown, in experiments on animals, its sympatholytic and adrenolytic actions, its effect on the cardiac output, and its vasodilator action on the limbs, and Winsor and Ottoman (1949) have confirmed its vasodilator action on the limbs in man The effects of priscol on the peripheral circulation in the limbs of 40 adults are reported here

METHOD AND RESULTS

The blood flow through the limbs of 30 patients (including 6 normal volunteers) was measured by a thermostatically controlled modification of the water filled venous occlusion plethysmograph (Barcroft and Edholm 1945) Fifty limbs were studied by this method

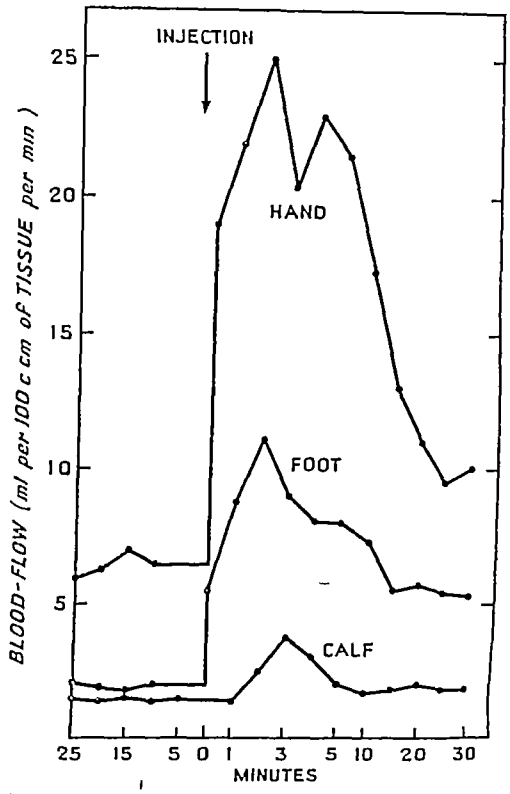
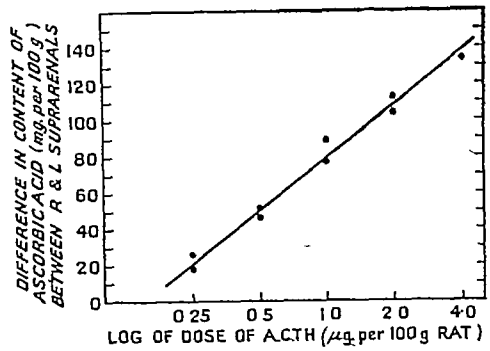


Fig 1—Blood-flow in normal person after intravenous injection of priscol 50 mg (In all charts arrow indicates completion of injection.)

In the 6 normal volunteers the intravenous injection of priscol 50 mg caused a pronounced increase in blood flow through the hands and feet and only a slight increase in the calf (fig 1) Priscol 50 mg injected into the femoral artery caused a maximal effect in the ipsilateral foot and only a slight increase in the blood flow through the contralateral foot (fig 2) This increase in blood flow was transient but was maintained in all cases above the pre existing level for the duration of the test but had returned to normal by the next day

In 3 sympathectomised patients (1 operated on for thromboangiitis obliterans, 1 for arteriosclerosis, and 1 for pernio) the intravenous injection of priscol 50 mg caused no appreciable change in blood flow through the feet (fig 3)

In 13 patients with vasospastic disorders of the limbs (Raynaud's disease 3, Raynaud's phenomenon 8, acrocyanosis 1, erythrocyanosis frigida 1) the intravenous injection of priscol caused an immediate increase in the blood flow in both the hands and the feet (fig 4) Ten of these patients received 150 mg of priscol by mouth daily for periods ranging from one to six months, and a definite clinical improvement was noted by both patient and observer in the 3 patients with Raynaud's disease and in 5 of the 8 patients with Raynaud's phenomenon One of the patients with Raynaud's phenomenon had previously had from one to three attacks of vasospasm every day, but after taking priscol by mouth for a month (March) had only one attack during the period of therapy One patient with Raynaud's phenomenon secondary to scleroderma, and another with Raynaud's phenomenon secondary to Pott's paraplegia, showed no improvement Four patients with persistent vasospasm after sympathectomy showed considerable improvement Of 4 patients with vasospastic disorders whose blood flows were estimated before and after the



Standard curve used in estimating adrenocorticotropic activity of blood plasma. Each plotting point represents the mean of the findings in six rats.

Rats weighing about 150 g were hypophysectomised by the parapharyngeal approach under light ether anæsthesia Twenty four hours later they were anæsthetised with pento barbitone sodium, 4 mg per 100 g of body weight, and the left suprarenal was removed from each rat for analysis 0 5 ml of the final extract was then given intravenously into a tail vein, and an hour later the right suprarenal was removed from each rat and prepared for analysis The amount of ascorbic acid was estimated by the technique of Roe and Kuether (1943)

The difference in content of ascorbic acid between the left and right suprarenals is regarded as the index of the adrenocorticotropic activity of the extract of blood plasma (see figure)

The reference standard, in which the results are expressed, is a sample of beef A C T H prepared in this laboratory according to the technique of Fishman (1947) in which the initial extraction procedure is identical with that used in preparing the plasma extract,

MATERIAL

The subjects investigated were 12 normal people aged 17–61, 3 patients with Cushing's syndrome, 1 patient with panhypopituitarism, 1 patient with Simmonds's disease, 6 patients with severe congestive failure (both while in acute failure and under control), 2 women with simple hirsutes, 3 postoperative patients, and 6 patients with uncontrolled diabetes mellitus but with no evidence of ketosis

All 3 cases of Cushing's syndrome presented with similar characteristics—namely, rapidly increasing obesity, moderate hirsutes, and amenorrhœa

Case 13 showed gross obesity with pigmented striæ confined to the abdomen and lower thorax blood pressure 180/110 mm Hg moderate hair growth on the upper lips glycosuria pubic hair of masculine distribution, and atrophic external genitalia

Case 14 showed moderate obesity somewhat more generalised but principally abdominal with pigmented striæ blood pressure 170/110 mm Hg, intermittent glycosuria hirsutes of face and thorax pubic hair of masculine distribution and atrophic external genitalia

Case 15 showed well marked abdominal obesity, with pigmented striæ blood pressure 150/110 mm. Hg no facial hirsutes pubic hair of masculine distribution and atrophic external genitalia

The biochemical findings are summarised in table I

Case 16 (Simmonds s disease) —Two years before admission she had had a very difficult labour with severe postpartum hæmorrhage necessitating repeated transfusions After it lactation did not come on, amenorrhœa persisted, and the axillary and pubic hair and eyebrows disappeared She was a slow speaking and somewhat mentally retarded young woman with a tendency to obesity, no eyebrows and no axillary or pubic hair, and gross atrophy of external genitalia.

The results are expressed in table I and a statistical survey is given in table II

DISCUSSION

Assay

The assay technique, as described, is subject to certain criticisms First, as fractionation was not carried through to the "pure" hormone stage, we cannot state that the extract contains no substance other than A C T H Secondly, it must be emphasised that the values obtained do not necessarily represent true amounts of A C T H per 100 ml of plasma but merely activity in terms of a particular standard This statement is further strengthened by the work of Li (1950) and others who have shown that hydrolysis of the so called "pure hormone"

TABLE I—ADRENOCORTICOTROPIC ACTIVITY

Case no	Age (yr)	Sex	Blood sugar 1 hr after 50 g of glucose	Glycosuria	A C T like activity (μg per 100 ml of plasma)	17 ketosteroids (mg per 24 hr) (normal 4–19)	11 glucosteroids (μg per 24 hr) (normal 40–65)†
					A, normal controls		
1	24	F			155		
2	29	F			143		
3	22	F			190		
4	22	M			230		
5	38	M			270		
6	36	M			197		
7	37	F			200		
8	19	F			172		
9	17	F			247		
10	61	F			150		
11	54	M			187		
12	31	M			220		
					Mean 197 ±39*		
					B Cushing's syndrome		
13	29	F	286	++	560	25	408
14	32	F	188	+	353	6	126
15	26	F	192	+	440	14	258
					Mean 451 ±104		
					All these cases showed much insulin resistance		
					C Simmonds's disease		
16	26	F	104	Nil	28	Nil	Nil
					This patient shows much hypersensitivity to insulin (basal metabolic rate 40 %)		
					D hypopituitarism with dwarfism and obesity		
17	34	F	138	Nil	112	9	48
					This patient shows normal sensitivity to insulin		
					E Hirsutes in females with no masculinisation or metabolic upset		
18	28	F	138	Nil	271	14	48
19	24	F	124	Nil	267	21	51
					Insulin sensitivity normal		
					F congestive heart failure		
					(i) In failure / (ii) Controlled.		
20	61	F		Nil	447 / 220		
21	58	M		Nil	471 / 188		
22	48	M		Nil	396		
23	54	F		Trace	408 / 176		
24	61	F		Nil	356 / 166		
25	76	M		Nil	392 / 210		
					Mean 412 ±41* / 192 ±25*		
					G after operation		
26	31	M			343		
27	21	M			317		
28	54	F			382		
					Mean 337 ±35*		
					H diabetes mellitus (uncontrolled but without ketosis)		
29	47	F	302	+++	193		
30	31	M	281	+++	171		
31	68	F	426	+++	235		
32	27	M	301	+++	193		
33	33	M	224	+++	186		
34	58	F	382	+++	235		
					Mean 202 ±27*		

* = Standard deviation
† Estimated by method of Venning et al (1942)

Comparison of A C T like activity of the various groups investigated shows that

For A and B	$n = 13$	$T = 7\ 21$	P is <0 001
A and F (i)	$n = 16$	$T = 10\ 75$	P is <0 001
A and F (ii)	$n = 15$	$T = 0\ 264$	P is 0 8
A and G	$n = 13$	$T = 5\ 59$	P is <0 001
A and H	$n = 16$	$T = 0\ 270$	P is 0 8
F (i) and F (ii)	$n = 4$	$T = 12\ 22$	P <0 001

T represents the variance of the means and P the probability of the results being due to chance Values of P of 0 01 or less are regarded as significant

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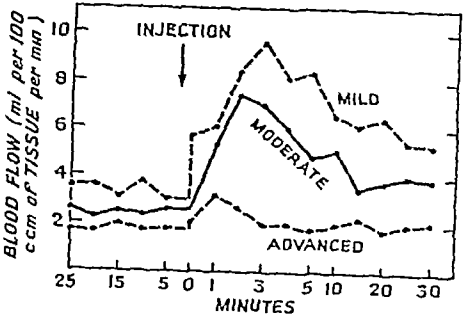
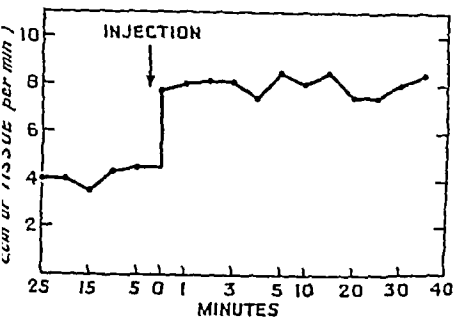


Fig 5—Blood flow in feet of patients with mild moderate, and advanced arteriosclerosis after intravenous injection of priscol 50 mg

followed by facial flushing, suffusion of the ivæ, palpitations, and a feeling of full he head These symptoms passed off in about utes, but the blush was apparent for much In most cases there was a mild transient tachy- In the dosage used in this study no appreci ct on the blood pressure was noted Various



d flow in ipsilateral calf in patient with arteriosclerosis after injection of priscol 50 mg into femoral artery

" goose flesh " and shivering were encountered rial injection was not followed by any ill effects

SUMMARY

ects of priscol administered by mouth, intra and intra arterially have been studied in nts Clinical criteria and venous occlusion graphy were used for the assessment of

is a peripheral sympathetic blocking agent, ts greatest effect on the hands and feet It effect on the calf

f value in the treatment of vasospastic dis t it is unlikely that it will improve patients with vascular disease

ue of priscol in the treatment of acute arterial needs further confirmation

be of value in the determination of suitable for sympathectomy

e and well tolerated in therapeutic doses

ol was provided by Ciba Laboratories Ltd

ADDENDUM

his paper was submitted for publication, C Swan, at the Sherrington School of Physio Thomas's Hospital, has shown that the intra jection of 50 mg of priscol into the brachial ses an immediate and pronounced increase od flow in the sympathectomised hand His has been confirmed in the sympathectomised e the injection of 50 mg of priscol into the tery increases the blood flow in the foot four times its previous value This finding hat priscol, besides being a sympathetic gent, has a direct local action on the blood vessels when delivered to them in a sufficiently high concentration

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ADRENOCORTICOTROPIC ACTIVITY OF BLOOD-PLASMA EXTRACTS

J BORNSTEIN* PHYLLIS TREWHELLA*
M.D Melb, M R A.C P B Sc Melb
From the Baker Medical Research Institute, Alfred Hospital, Melbourne

THE experiments of Conn and his group (1948, 1949), in which temporary diabetes mellitus was induced in human volunteers by the administration of pituitary adrenocorticotropic hormone (A C T H), made it desirable to ascertain whether this substance was present in excess in the blood of patients with diabetes mellitus.

The possibility of such an assay was first shown when Sayers et al (1948) assayed A C T H by the decrease in amount of suprarenal ascorbic acid in hypophysectomised rats Cooke et al (1948) showed that acetone fractionated blood plasma would produce such a decrease

Taylor et al (1949), reviewing the literature, considered that all the methods used before that of Cooke et al (1948) were inconclusive Using unfractionated blood plasma they found no activity in plasma obtained from normal persons but they demonstrated activity in plasma obtained from patients with Cushing's syndrome or Addison's disease, and patients under postoperative stress

The discrepancy between the results obtained by Cooke et al (1948) and Taylor et al (1949) suggested to us that fractionation of the plasma was necessary

The method finally chosen is a modification of the technique used by Lyons (1937) to obtain crude 'Prolactin,' which contains A C T H from the anterior pituitary glands

METHOD

Preparation of Extract

10 ml of blood was taken from the subject into a heparinised syringe and immediately centrifuged The plasma was taken off and added to 4 volumes of acid acetone, prepared by adding 25 ml of analytically pure hydrochloric acid to 975 ml of redistilled acetone The resulting precipitate was allowed to stand at room temperature for eight hours, being vigorously shaken at intervals, and then centrifuged The supernatant fluid was taken off 1 ml of saturated sodium chloride solution was added, and the concentration of acetone was brought to 94% The mixture was agitated and allowed to precipitate at 4°C for twelve hours

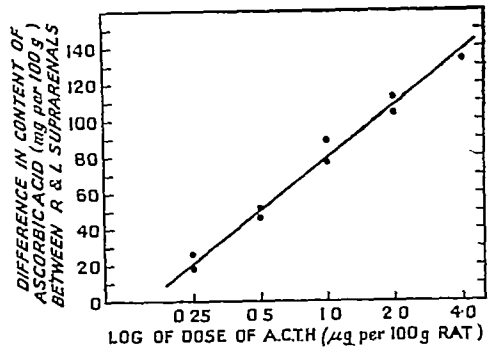
The resulting precipitate was centrifuged and the supernatant fluid discarded The final residue was washed with acetone and dried in a desiccator

From 6 ml of plasma containing roughly 360–420 mg of total proteins about 4–8 mg of final precipitate was obtained This precipitate was dissolved in 2 5 ml of distilled water

Assay

The assay was carried out according to the classical method of Sayers et al (1948) The consistency of the results is much improved if, after preliminary narcotisation with pentobarbitone sodium, ether anæsthesia is used

* Working under a full time grant from the National Health and Medical Research Council (Commonwealth of Australia)



Standard curve used in estimating adrenocorticotropic activity of blood-plasma. Each plotting point represents the mean of the findings in six rats

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23	54	F		Trace	408 / 176		
24	61	F		Nil	356 / 166		
25	76	M		Nil	392 / 210		
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					Mean 202 ±27*		

* = Standard deviation
† Estimated by method of Venning et al (1942)

Comparison of A C T like activity of the various groups investigated shows that

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A and H	$n = 16$	$T = 0\ 270$	P is 0 8
F (i) and F (ii)	$n = 4$	$T = 12\ 22$	P <0 001

T represents the variance of the means and P the probability of the results being due to chance Values of P of 0 01 or less are regarded as significant

yields polypeptides whose activity is, weight for weight, about eight times that of the protein hormone

However, as a result of our study of abnormal states in which the concentration of A C T H may be expected to vary, a striking parallelism has appeared between the activity of the plasma extracts as estimated by our technique and the excretion of 11 glucosteroids As it has been shown by many workers that the injection of A C T H leads to the excretion of excess 11 glucosteroids, we consider that the assays at least give a representation of the adrenocorticotropic activity of the blood plasma, though we do not suggest that the figures obtained represent true weights of A C T H

TABLE II—STATISTICAL SURVEY OF DECREASES IN AMOUNT OF ASCORBIC ACID IN SUPRARENALS

Case no	No of rats used in assay	Mean weight of rats (g)	Mean fall in ascorbic acid concentration from right to left suprarenal (mg 100 g)	Standard deviation
A normal controls				
1	4	150	88	12 68
2	5	118	86	11 72
3	4	162	94	12 10
4	6	167	101	10 42
5	6	174	106	9 88
6	4	153	99	10 23
7	5	148	100	11 10
8	5	162	90	10 14
9	5	168	104	9 64
10	4	142	90	10 21
11	4	156	95	8 68
12	6	161	101	8 49
B Cushing s syndrome				
13	4	171	140	12 41
14*	8	148	124	9 86
15*	8	162	136	9 87
C Simmonds s disease				
16	4	158	28	6 21
F congestive heart failure				
20 in failure	6	164	129	9 86
20 controlled	4	158	100	9 41
21 in failure	4	163	128	12 84
21 controlled	4	145	91	9 75
22 in failure	4	151	120	10 30
23 in failure	4	157	120	10 03
23 controlled	4	156	86	11 64
24 in failure	6	145	120	12 46
24 controlled	6	163	82	13 12
25 in failure	4	149	121	12 12
25 controlled	4	168	96	11 08
G after operation				
26	6	168	117	8 46
27	6	153	118	8 12
28	4	162	120	9 58
H diabetes mellitus				
29	4	158	96	12 21
30	4	164	86	11 86
31	6	167	101	10 97
32	6	162	95	9 46
33	4	147	98	11 82
34	4	153	105	10 61

* These consist of two assays carried out on the same sample of plasma

In no case did the weight of any rat vary more than 5 g from the mean

ANALYSIS OF TABLE II

		Lowest value of T obtained	P
Case no 5	compared with case no 13	4 65	<0 01
5	14	3 37	<0 01
5	15	5 90	<0 01
2	16	7 73	<0 01
5	24 (in failure)	2 16	<0 1 >0 05
5	26	2 07	<0 1 >0 05

Figures in F (i)	F (ii)	T	P
20 (i)	20 (ii)	4 54	<0 01
21 (i)	21 (ii)	4 96	<0 01
23 (i)	23 (ii)	4 44	<0 01
24 (i)	24 (ii)	5 16	<0 01
25 (i)	25 (ii)	2 92	<0 05 >0 02

Consideration of these results shows that there is a significant alteration of ascorbic acid depletion in Cushing's syndrome and Simmonds s disease but that the alterations in congestive failure and postoperative states can only be regarded as suggestive How ever the comparison between the same cardiac patients while in failure and after recovery shows a significant alteration in all cases

It may be said that the values of activity in terms of the standard appear extremely high, but in this respect it is pointed out that, when A C T H is used therapeutically 10–25 mg has to be given in one injection to produce a maximal effect, and this dose is equivalent to 330–830 µg per 100 ml of plasma

Conditions Investigated

The results found in Cushing's syndrome show that in the 3 cases investigated the primary disorder seems to be a form of hyperpituitarism acting through the suprarenals

The result obtained in Simmonds's disease is what one would expect in this condition, since it is assumed that the pituitary has been destroyed

The results obtained in hirsutes in females, showing no metabolic or sex upset, although somewhat raised are only slightly above the upper limit of the normals, and we think them of doubtful significance

Similar considerations apply to the case of hypo pituitarism, where only a small diminution in the activity of the extract was found

The results obtained in the postoperation cases demonstrate that, in the presence of stress, there is an increase in corticotropic activity which is in keeping with the well known finding that excretion of 11 glucosteroids is increased considerably after operations

The finding of normal values in uncontrolled diabetes mellitus without ketosis is in keeping with the findings of McArthur et al (1950) that excretion of steroids was normal in diabetes mellitus except in the presence of ketosis, when it was increased

The results generally suggest that the diabetic state produced by Conn et al (1948 1949) resembles that found in the Cushing syndrome

The most significant findings are those obtained in cardiac failure, where blood obtained from the distressed dyspnœic cardiac patient has a raised adrenocortico tropic activity, which subsides to normal on recovery of the patient to a more normal general state Though we regard this as merely another example of response to stress, the work of Conn and Louis (1950) on the salt content of sweat suggests that in these circumstances excess adrenocorticotropic activity may lead to retention of sodium and thus maintain a vicious circle

SUMMARY

A technique for the assay of adrenocorticotropic activity of human blood plasma is described

Increased activity was found in Cushing's syndrome, postoperative stress, and congestive heart failure Greatly reduced activity was found in Simmonds's disease Normal activity was found in uncontrolled diabetes mellitus without ketosis

We wish to thank Dr Ewen Downie, Dr T E Lowe, Dr H B Kay, and Mr G Grove, of the Alfred Hospital, for permission to study cases under their care, and Miss M Bick, senior biochemist of the hospital, for the 17 ketosteroid estimations

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RELAPSE OF KALA-AZAR AFTER SPLENECTOMY

A DAS
M.B Calcutta, M.R C.P
PROFESSOR OF CLINICAL MEDICINE
MEDICAL COLLEGE, CALCUTTA

P C SEN GUPTA
M.B Calcutta
OFFICER I C KALA-AZAR RESEARCH DEPARTMENT,
SCHOOL OF TROPICAL MEDICINE, CALCUTTA

SEVERAL reports have been published during the last few years indicating that splenectomy may be successful in curing drug resistant kala azar Morton and Cooke (1948) reviewed the literature on the subject and reported three cases, one a previously untreated case and two drug resistant cases, that were cured of kala azar after splenectomy preceded and/or followed by specific treatment They concluded that splenectomy should be considered in selected drug resistant cases of kala azar and the operation followed by further courses of chemo therapy Murgatroyd (1949) also reported the immediate success of splenectomy in a case of drug resistant kala-azar Napier (1949), reviewing the paper of Morton and Cooke, reported that one of the drug resistant cases reported by them relapsed later We present here a case of drug-resistant kala azar that relapsed after splenectomy

CASE RECORD

An Indian aged 25, was admitted to the Medical College Hospital Calcutta on Oct 2 1948 He had first suffered from enteric like fever for three weeks about the end of 1940 After an apyrexial period of two months he had relapse of fever with bleeding from the gums and splenic enlargement He was then diagnosed as a case of kala azar and was treated with injections of urea stibamine He was in good health for three months, then he had a relapse which was treated with sodium antimony gluconate, and he was relieved of his symptoms. During 1942 and 1943 he had no significant fever During the latter part of 1943 he had a relapse with jaundice and firm splenomegaly After protracted treatment by various methods he partially responded to antimonials A subsequent relapse occurred in 1947, and he was admitted to a hospital with pyrexia enlargement of the liver, and massive splenomegaly A blood-count showed anæmia and leucopenia with a decrease in the number of granulocytes the aldehyde test was positive and the antimony test strongly positive In spite of treatment with sodium antimony gluconate the spleen remained massive and the patient was suspected of having splenic anæmia In 1947 he was transferred to another hospital for splenectomy (November, 1947), after which he was in good health for about four months Then the present attack of fever commenced. The fever was mainly intermittent and often associated with chill and rigor and occasionally there was bleeding from the gums Several of his family had had kala azar

On admission the patient was thin and anæmic the gums were spongy and bled on slight pressure There was a splenectomy scar on the left paramedian line over the abdomen The liver was firm slightly tender, and enlarged to four finger breadths below the costal margin. A blood-count showed anæmia (Hb 8 g per 100 ml.) and slight leucopenia (white cells 4500 per c mm.) and platelets 254,000 per c.mm The aldehyde test and the complement-fixation test for kala azar were positive and numerous Leishman Donovan bodies were found in the sternal puncture smear The urine and the fæces did not show any abnormality A radiograph of the chest was normal.

Treatment and Progress—The patient was treated with urea stibamine, 2 75 g being given in sixteen injections between Nov 9 and Dec. 20 1948 During the course of injections he had severe hæmorrhages from the gums, and this led to interruption of specific treatment The hæmorrhage did not respond to the usual antihæmorrhagic drugs, but the bleeding subsided each time after penicillin injections During this period a painful swelling developed over the right tibia radiography showed a small area of necrosis on the upper posterior part of the tibia The appearances were not those of scorbutic changes

At the conclusion of the injections of urea stibamine the patient did not become completely afebrile occasional attacks of low intermittent pyrexia persisted But he felt better and gained 2 lb in weight A blood count done a month after the completion of specific treatment showed Hb 9 28 g per 100 ml, red cells 3,140 000 per c.mm (reticulo cytes 1 6%) mean corpuscular volume 98 7 c μ, mean corpus cular Hb 29 5 μμg, mean corpuscular Hb concentration 29 9%, white cells 10,200 per c mm. (neutrophils 55%, lymphocytes 28% monocytes 8%, eosinophils 9%), platelets 804 000 per c.mm, and prothrombin time 30 sec A sternal puncture smear on Jan. 24 1949, showed leishmania the marrow was cellular and showed normoblastic reaction It was therefore apparent that, in spite of the considerable increase in the number of leucocytes and platelets, the patient was not cured of kala azar

About the first week of February 1949, the patient developed slight ascites He was next put on a course of pentamidine, 0·75 g being given in eight injections on consecutive days But there was an increase of fever and recurrence of bleeding from the gums Pentamidine had to be withheld because of high fever and the onset of other complications

On Feb 23, 1949, the patient showed signs of pleural effusion on the left side and on March 2 1949 on the right side as well Exploratory puncture produced straw-coloured fluid containing total protein 6 5 g per 100 ml, albumin 3 8 g per 100 ml, globulin 2 7 g per 100 ml

The patient steadily went downhill in spite of symptomatic treatment and the high remittent fever persisted He died on March 10 1949 Necropsy was refused

DISCUSSION

This patient had the first attack of kala azar with enteric like onset about the end of 1940 Kala-azar was diagnosed, and the patient was treated with urea stibamine in 1941, but he relapsed about three months later The subsequent history is essentially one of relapses of kala azar at various intervals and of occasional antimony therapy, with increasing splenomegaly and the onset of various complications with the passage of time Unsatisfactory response to antimony apparently led to the diagnosis of splenic anæmia and ultimately to splenectomy The patient was in good health for only four months after splenectomy and then he had the next relapse The treatment of this relapse of kala azar with urea stibamine was not successful in eradicating the infection, the parasites persisted in the sternal puncture smear a month after the completion of the course of injections of urea stibamine The patient was next being treated with pentamidine, when he developed high fever and polyserositis and died

The other clinical features of interest were the severe hæmorrhages from the gums that apparently responded satisfactorily to penicillin and not to antihæmorrhagic drugs, the necrosis of bone and the polyserositis a rare complication of kala azar

The results obtained by different workers with splenectomy in the treatment of kala azar are as follows

Reference	*No of cases*	*Cures*	*Failures*
Drug resistant cases treated with chemotherapy before and or after splenectomy			
Timpano (1930)	1	1	0
Martin et al (1935)	1	1	0
Burchenal et al. (1947)	1	1	0
Morton and Cooke (1948)	2	1	1
Present case	1	0	1
Total	6	4	2
Ordinary cases treated with splenectomy alone			
Makkas (1912)	2	1	1
Cochran (1915)	3	0	3
Kokoris (1915)	3	1	2
De Souza (1923)	14	5 (14)	9 (110)
Olmer (1931)	1	0	1
Total	23	7 (16)	16 (117)

TABLE II—RELATION OF CYTOLOGICAL CHANGES TO INITIAL CELL-COUNT

Initial cell count (per c mm)	No of cases	Average cell count		
		Spec 2	Spec 3	Spec. 4
0–1	43	5	8	22
2–4	17	8	16	34
5–10	8	17	26	53

was observed The chlorides were examined in 18 cases and showed an alteration of more than 3 mg per 100 ml in 4 cases only The sugar was estimated in 23 cases, but an alteration of more than 3 mg per 100 ml was observed in no more than 2 cases The protein was estimated in 57 cases, and, a change of 3 mg per 100 ml being again taken as the smallest significant change, there was a fall in 24 cases, no change in 23, and a rise in 10 In 2 cases the rise was considerable (27 mg and 49 mg per 100 ml), and both these were cases of post traumatic external hydrocephalus—the only possible correlation with diagnosis that was discovered

PREVIOUS WORK

Neither Luckett (1913) nor Dandy (1918, 1919) mentioned any changes in the C S F , and the first recorded study after pneumo encephalography is that of Hermann (1922), who, like several later workers (Weigeldt 1922, von Thurzo and Nagy 1923, Cestan and Riser 1924, Friedman et al 1928, Jacobi 1930, Grant 1932, Eley and Vogt 1932, Krypsin Exner 1932, Liberson 1933, von Storch 1936, Newman 1937, Levinson et al 1939), concentrated his observations on the very different and more dramatic changes which occur in the hours following pneumo encephalography

Tschugunoff (1929) found, in 10 cases, a mononuclear pleocytosis at the end of the procedure, and Conwell (1930) observed such a rise during its course, similar findings being reported by Lund and Neel (1941) in 36 mental patients

The most important study, however, is that of Schwab and von Storch (1937), who compared the cytological changes during and after pneumo encephalography, using the method of alternate replacement on 14 patients and simultaneous replacement on 10 They state " Differential counts on 13 samples of C S F demonstrated a rise of more than 75% polymorphonuclear cells in all earlier samples " The changes were less with the simultaneous method

DISCUSSION OF PLEOCYTOSIS

It therefore seems that a rise in the mononuclear cell count is always to be expected during pneumo encephalography, that the degree of rise is very variable, and that it depends only on the number of cells initially present It follows that samples of C S F taken during pneumo encephalography are in no way representative of the normal cytology of the C S F

The constancy of this rise is at variance with the findings of Alajouanine et al (1948), who attached diagnostic significance to the cell count found after the introduction of 40 c cm of air, but it is not clear how long afterwards the second samples were analysed Nor do the the present findings support the statement by Schwab and von Storch (1937) that there is a 75% polymorph response in the earlier specimens

As regards the mechanism of these changes, it seems that several possible explanations can be offered for the rise in the cell count (1) the changes are the result of the withdrawal of large amounts of C S F , (2) they are due to the irritant effect of the air , (3) they are associated with the alternate lowering and raising of the intrathecal pressure , or (4) they are due to a combination of the above

Removal of Fluid

If this alone were responsible, simple thecal drainage done with similar apparatus, similar quantities of fluid, and over a similar time as in pneumo encephalography should produce a progressive rise in cell count This manœuvre is now only occasionally done, for it is necessary to remove at least 35–40 ml of C S F before one has a comparable situation

In 2 cases of sagittal sinus thrombosis and 3 of post traumatic headaches 40 ml of C S F was removed by this method , and, though the figures were originally only small, there was in each case a progressive fall in cell count This is not unexpected, when one considers that one is draining the cerebral subarachnoid spaces and ventricles, where the cell count is normally lower than in the lumbar C S F This was confirmed to some extent in a case where a pneumo encephalography was done for the second time 8 days after the first The initial sample of C S F was still abnormal (containing 30 mononuclear cells per c mm) , and, whereas we have seen that high initial samples are usually accompanied by high final counts, in this case there was a steady fall throughout It was then discovered that owing to faulty apparatus no air had entered the thecal space and a simple thecal drainage had been done

Though Masserman (1934) and Riser and Planques (1936), investigating protracted drainage of C S F , found that a pleocytosis developed, this did not manifest itself until several hours after the start of drainage, whereas it has been shown here that during pneumo encephalo graphy the pleocytosis is usually evident within the first 10 minutes It therefore seems that simple removal of C S F cannot be responsible

Irritant Effect of Air

On casual thought this seems to be the most likely explanation, but it is doubtful if it will survive closer examination It is, for example, difficult to believe that a substance with such mildly irritating properties as air can, within so very short a time, produce so great a rise in cell count In 50 cases a definite, and sometimes considerable, rise had appeared in specimen 2 (and therefore within 10 minutes) In one case the count had risen from 7 to 34 cells per c mm in 10 minutes , in another from 1 to 18 cells per c mm in 3 minutes , and in a third from 1 to 13 cells per c mm in 2 minutes , and there are many examples of smaller, but still significant, changes which have developed in a very short time If this is to be attributed to the irritation of the meninges by air, it is obviously a very acute process One would therefore expect to find an outpouring of polymorph, but these begin to appear only towards the end of the longer procedures, and often (43 cases) do not appear at all

That the air plays the rôle of an irritant at a later period is undoubted, for all specimens examined several hours afterwards showed a high polymorph reaction , but, when the reaction develops during pneumo encephalography, one is forced to conclude either that the earliest response to meningeal irritation is a mononuclear response, or that some other mechanism is responsible

The mononuclear response during pneumo encephalography is perhaps emphasised in those patients examined after some other procedure in which the meninges have been irritated—e g , ventriculography, or blood contamination during lumbar puncture One such patient, examined five days after a ventriculography in which the fluid was also slightly contaminated by blood, gave the following figures

	Cells per c mm		
	Total cells	Polymorphs	Mononuclears
Initial specimen	26	15	11
After 25 ml (7 minutes)	40	15	25
After 75 ml (35 minutes)	63	19	44

Exactly the same type of response was found in 3 other similar cases

During the present investigation, with the cooperation of the neurosurgical department, a few specimens of C S F were examined during ventriculography—the first on initially tapping the ventricles, and the second about 20–30 minutes after the introduction of 20–25 c cm of air No rise in the cell count was demonstrated, yet examination next day, or several days later, showed that a polymorph response had eventually taken place

It seems that, though the irritant effect of the air may show itself several hours after pneumo encephalo graphy, this alone is not responsible for a significant increase in cell count during the early minutes of the operation

Alternate Raising and Lowering of Intrathecal Pressure

However carefully one regulates the withdrawal of C S F and introduction of air when using the alternate replacement method, a swing from negative to positive pressure within the thecal space is bound to happen often, when small quantities of C S F (5 ml.) are replaced at one time

Von Storch (1936) and Schwab and von Storch (1937) found a much smaller rise with their simultaneous replacement method, and believed that the alternate method produced a form of "cerebral massage" with alternate dilatation and constriction of cerebral and meningeal arterioles hyperæmia, cerebral œdema, and exudation of cells, If this is so, withdrawal and reinjection of C S.F alone without air being introduced, should have a similar result That this does happen has been shown by Masserman (1934), who found that by repeated drainage and reinjection of C S F counts as high as 3600 cells per c mm could be obtained, and he notes that "alternate reduction and increase in pressure can of itself produce pleocytosis"

Levinson et al. (1939) also believed that the permeability of the meningeal and cerebral vessels was increased, and this forms the theoretical basis of "spinal pumping,' introduced by Speransky (1936), whose pro cedure is essentially comparable to that of pneumo-encephalography, except that the C S.F is reintroduced and no air is allowed to enter Speransky thought that there is a considerable increase in the permeability of the blood brain barrier, and claimed remarkable cures of an amazing variety of diseases He and his co workers do not record any examination of the cell count in the C.S.F in man but they mention that in dogs the C S F became turbid, next yellow, and finally frankly bloodstained.

The work that has been done on this method in recent years has been mainly in the treatment of rheuma toid arthritis (Gillman and Gillman 1946, Savage 1948), but no mention is made of cytological examination

Personal observations have been made, however, in 3 cases where the conditions of pneumo-encephalo graphy were reproduced but each portion of fluid with drawn was reinjected, with great care to allow no air to enter In 2 cases the cell count was unchanged, and in the 3rd it rose 1 cell to 3 cells per c mm only In these cases the "cerebral massage" was not accompanied by extensive withdrawal of fluid as in Masserman's work.

Combination of Factors

From what has already been said it seems unlikely that the mere withdrawal of C S F plays any part in this phenomenon but the combination of such with drawal with the mechanical "massage" is important The fact that Schwab and von Storch (1937) still found changes though much smaller, when using the simultaneous technique suggests that, if the apparatus was efficient, the air or its movement through the C S F plays some part, and Kamhara et al (1932) found, in dogs, that the introduction of very small amounts of air (0 5–1 0 c cm) tended to produce a lymphocytic response about an hour afterwards, whereas larger amounts led to a polymorph pleocytosis It may therefore be incorrect to exclude any direct effect of the air in the early stages

BIOCHEMICAL CHANGES

The only frequent biochemical change was a decrease in the protein content, probably due to dilution of lumbar C S F with that from the intracranial cisterns Previous observers have reported an increase in sugar (Schwab and von Storch 1937, Levinson et al 1939), and Bradley (1937) and Delay and Soulairac (1944) have shown a hyperglycæmia towards the end of and after encephalography, and it would not be difficult to understand, if meningeal vascular permeability is increased, how a rise in the C S F sugar level might parallel that in the blood

The changes which take place hours and days after pneumo encephalography present a very different picture These are being studied in detail and will be reported later, for they are on occasion the cause of considerable alarm both to patient and attendant, are not infrequently misinterpreted, and may be the reason for unnecessary intrathecal medication

SUMMARY

The changes in cytology and biochemistry of the cerebrospinal fluid in the course of pneumo encephalo graphy have been studied in 68 cases

The cell count rose in 66 cases, starting within ten minutes in 50 cases, and reaching figures between 30 and 92 cells per c mm in the final specimen in 22

Mononuclear cells were almost exclusively involved, the polymorphs appearing in very small numbers at the end of the operation in 25 cases only

The level of the initial cell count was the only factor influencing the response

Biochemical changes were slight and of little signifi cance

Possible explanations for the changes are discussed

The major credit for the results of this investigation goes to the staffs of the departments of clinical pathology and biochemistry, United Birmingham Hospitals, under the direction of Dr A L Peeney and Dr Garfield Thomas respectively I wish also to thank the house physicians to the neurological unit who successively gave great assistance with the pneumo-encephalographies, and Prof P C P Cloake and Dr G S Hall, on whose patients the great majority of these investigations were made

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Medical Societies

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Symmetrical Cortical Necrosis of the Kidney

AT a meeting of the section of obstetrics on Nov 17, with Mr V B GREEN ARMYTAGE, president of the section, in the chair, a discussion on symmetrical cortical necrosis of the kidney was opened by Prof H L SHEEHAN

He described the pathological findings in the kidney at various times after concealed accidental hæmorrhage He attributed cortical necrosis and other less severe renal lesions to angiospasm occurring approximately coincidentally with the intra uterine hæmorrhage Evidence of parenchymal damage or death, and necrosis and thrombosis of arteries, appears when the spasm relaxes and blood flows into the damaged area The severity of the histological changes are correlated with the extent and duration of the antecedent angiospasm, and these changes may be classified into nine types

Type-1 lesions result from spasm of the afferent glomerular arteriole lasting 15–30 minutes, there is subsequent albuminuria and occasionally some cast formation in collecting tubules The kidney usually returns to normal in 1–2 days

Type-2 lesions follow afferent arteriolar spasm lasting about 1 hour Hyaline droplet formation or colloid degeneration of the proximal convoluted tubules progresses between 6 and 24 hours after the uterine hæmorrhage, but these changes disappear in the next 2 or 3 days Colloid casts may develop in the tubules of the intermediate zone and lead to more serious impairment of renal function

Type-3 lesions follow afferent arteriolar spasm lasting 2–3 hours The proximal tubule cells are killed, but are histologically unaltered until the blood flow returns, when they become necrotic The lesions are maximal after 24 hours Signs of regeneration appear after 3 days, and the tubules are relined with flattened epithelium after 6 days, this may atrophy later Extensive tubular necrosis produces great oliguria for a week or more and may lead to death

Type-4 lesions—"benign thrombosis of glomeruli"—follow 4–5 hours' arteriolar spasm with subsequent relaxation Thrombi lie freely in the centre of the glomerular capillaries The cortex otherwise shows a type-3 lesion

Type 5—"focal cortical necrosis"—is characterised by stasis or thrombosis of occasional glomerular tufts and afferent arterioles which have been killed by focal spasm in these arterioles lasting 8–10 hours These lesions develop at about 12–14 hours A few small foci of cortical necrosis result As with all other types of cortical necrosis, the remaining parenchyma is extensively involved by the type-3 lesion

In *type 6*—"minor cortical necrosis"—the spasm begins in afferent arterioles but later involves the distal segments of intralobular arteries where it lasts 8–10 hours The distal part of the arterial tree, and the glomeruli and tubules supplied by the affected artery, die Arterial necrotic lesions and thrombosis occur when the spasm relaxes

In *type 7*—"patchy cortical necrosis"—the spasm begins in afferent arterioles but subsequently moves back to many of the intralobular arteries at about mid-cortex It lasts about 15–18 hours When the spasm relaxes there is a characteristic arterial thrombosis The prognosis is very poor as so much of the cortex is destroyed

Type 8 lesions—"gross cortical necrosis"—result from an initial afferent arteriole spasm which later passes back to involve the intralobular artery distal to the origin of the afferent arterioles of the basal glomeruli The spasm lasts about 24 hours and produces death of most of the cortex When it relaxes, thrombosis occurs in the dead arteries This condition is always fatal, usually within 7–10 days

Type-9 lesions—a less common variant of "gross cortical necrosis"—are due to the arterial spasm lasting 2–3 days An occlusive thrombus forms at the proximal extremity of the affected arterial segment, and there are no lesions referable to the passage of blood into the damaged area

Dr A M JOEKES, together with Dr G M BULL and Dr K C LOWE, has studied 120 cases of anuria or low specific gravity oliguria, in 10 of which there was a possible diagnosis of cortical necrosis Of these 10 patients, 5 died and showed varying degrees of cortical necrosis, the other 5 survived after periods of anuria or oliguria ranging from 2 to 12 days, and all were pregnant women presenting with antepartum hæmorrhage, and with some degree of retroplacental clot Studies of the renal blood flow were made on 3 surviving patients, and the urine/blood ratio for urea followed in all patients who regained renal function The estimated renal plasma flow, measured with para aminohippuric acid, was low, and although in 2 cases renal venous catheterisation revealed a low extraction ratio, calculation of the true renal plasma flow showed it to be below normal

The reduction of plasma flow was more severe and prolonged in a case with oliguria lasting more than 6 days, than in 2 cases with oliguria lasting only 2–3 days The changes in renal function ran a course identical with those seen in tubular necrosis, eventually recovery was almost complete

Dr Joekes thinks there is no fundamental difference in the renal ischæmia apart from the degree of severity which results in either cortical necrosis or acute tubular necrosis Complete cortical necrosis is the irreversible end point of severe ischæmia, whereas with "incomplete cortical necrosis," in which recovery is possible, the principal lesion is necrosis of the proximal tubules, the ischæmia not being sufficiently severe to cause the death of more than a few isolated glomeruli In such cases the pattern of events is probably initiated by a low renal blood flow, leading to hypoxia and proximal tubular damage This gives rise to passive resorption of the glomerular filtrate, interstitial œdema, rise of intrarenal tension, and further reduction of the renal blood flow accompanied by anuria or low specific-gravity oliguria If the patient survives sufficiently long the tubular epithelium regenerates, diuresis probably coinciding with the relining of the tubules with low poorly differentiated epithelial cells Further differentiation of the regenerated epithelium allows of nearly complete recovery of renal function

Prof K J FRANKLIN said that cortical necrosis can be produced experimentally by ischæmia, and he doubts if its production is ever unassociated with ischæmia The methods used have included continuous or intermittent interruption of the renal circulation, intermittent stimulation of the renal nerves, and administration of various chemical substances, each of the last two procedures producing a diversion of cortical blood flow Chemical substances affecting the denervated as well as the innervated kidney may act through a local nervous reflex mechanism, and Professor Franklin discussed the evidence for the existence of such a mechanism in the kidney, with particular reference to the work of de Muylder If there is such a mechanism, the ætiological basis of all experimental cortical necroses may be nervously intermediated vasoconstriction, but the possibility of chemical substances acting as direct intrarenal poisons has not yet been excluded

Professor Franklin went on to describe recent observations on renal changes during parturition in the anæsthetised rabbit, and he suggested provisionally that, in the full term doe, there is a circulating humoral agent (possibly posterior pituitary extract) producing some degree of diversion of the renal cortical blood flow At the moment of parturition further diversion may be produced by nervous reflexes, possibly from the uterus

Dr J F HEGGIE observed that the oliguria which occurs during the initial stage of experimental sym-

metrical cortical necrosis is associated with the passage of urine whose composition closely resembles that of glomerular filtrate He remarked that the tubule cells of the rabbit's kidney regenerate after ischæmia of 1 hour He does not think that in man ischæmia lasting up to 6 hours would cause permanent damage to the kidney Dr Heggie has observed in animals the lesions described by Professor Sheehan In man the renal blood flow is reduced by 50% on assuming the erect posture, and Dr Heggie suggested that pregnancy toxæmia may render unduly irritable the mechanism responsible for this local control

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DURING the 1920s Professor Warburg produced two books, *Über die katalytischen Wirkungen der lebendigen Substanz* (1928) and *Über den Stoffwechsel der Tumoren* (1926), consisting almost entirely of collections of his previously published papers The present volume lies in character somewhere between these earlier works and a monograph In it he describes the results of the work of his laboratory on heavy metal containing enzymes, the researches and opinions of other workers being, on the whole considered only in so far as they lead up to, agree with, disagree with, or confirm his own.

Most of the book is concerned with the *Atmungsferment* (respiratory enzyme) here called the oxygen transporting enzyme' The earlier work with models and on the inhibition of cell respiration by cyanide, carbon monoxide, and hydrogen sulphide leads up to the triumphant determination (1928–29) of the photochemical absorption spectrum of the respiratory enzyme The painstaking control experiments are described, and it is seen that these were still continuing during the late war, in the study by Bücher and Negelein (1942) of the dissociation by light of carboxyhæmoglobin and carboxymyoglobin.

The rest of the book is concerned with fairly recent work by Professor Warburg and his colleagues on various metal containing enzyme systems, phenol oxidase, the hydrogen liberating enzyme in butyric acid fermentation and aldolase, the reduction of quinone by chloroplasts and disintegrated chloroplasts, and finally on the quantum requirement of CO_2 assimilation The translator has done his task well and the author's simple, clear, and trenchant style has not been lost

"The discussions which took place with Willstätter, Wieland, and Euler about oxygen transporting iron began in 1922 and ended in 1928 They were brought to an end by a controversy with Keilin which started in 1929 and finished in 1939" In this opening paragraph of chapter 16 Professor Warburg epitomises much of his career and of this book He has seen fit to return to the controversies of 10–30 years ago, and his attacks have softened little with time Professor Keilin, in a review [1] of the German version of this book, regretted that Professor Warburg had not rather elected to give a well-balanced historical account, and criticised various of his interpretations of the history of the subject Into this latest, albeit mild, clash of the two great antagonists we do not venture to intrude But this book raises again the question whether controversy in general is a necessary or even desirable element in scientific research In so far as it lubricates research by psychical stimulation of the workers it is of some value In so far as it estranges workers it is harmful, some of the great advances of today are coming from mutual help between different groups Much of it has been unnecessary, arising from the use of language rather than from observation of fact The echoes of the resounding polemics of the last century are dying away, and in private and scientific life individuals are becoming milder and more conciliatory Man tends to hurt feelings less and less as his power of destruction becomes greater and greater It may be that the revived polemics of this book are sounds of an era that is passing away

The National Health Service

ROGER ORMROD, M A, B M, barrister at law, HARRIS WALKER, barrister at law London Butterworth 1950 Pp 470 27s 6d

THIS book contains the texts of the National Health Service Acts, 1946 and 1949, annotated by Mr John H Ellison, barrister-at law, together with a clearly written introduction of 100 pages in which the meaning of the Acts and the statutory instruments to which they have given rise is set out in non-technical language with full references The final section of the book is reprinted from the Butterworth Emergency Legislation Service and contains all the statutory rules and orders and statutory instruments made under the National Health Service Acts from 1946 to April, 1950 The result is an authoritative reference book which will be of real value to lawyers and to all administrators, whether medical or lay, connected with the National Health Service

A Naturalist in the Gran Chaco

SIR JOHN GRAHAM KERR, F.R S, honorary fellow of Christ s College, Cambridge, and sometime regius professor of zoology in the University of Glasgow London Cambridge University Press 1950 Pp 236 21s

BASED on Sir John Graham Kerr's diaries of sixty and fifty-four years ago this account of thrilling adventures and scientific discovery is in the tradition of Darwin's voyage in H M S *Beagle* and of Bates's *Naturalist on the Amazons*, and are therefore a useful corrective to some modern books on the same region

Two expeditions are described The first, in 1889–91, was an exploratory survey of the Pilcomayo river from the Paraná to the frontiers of Bolivia Unfortunately most of the valuable zoological collections were mysteriously lost, but the young student, Graham Kerr became an intimate friend of the extremely primitive Natokoi Indians with whom he hunted as a lone white, and whose language he tried to note down phonetically One long chapter is devoted to a description of this tribe Commenting on the wonderful health of the Natokoi, Sir John says "Not only is the individual promptly eliminated, but even the tendency towards disability is being constantly weeded out so that, as in the case of wild animals, the race is maintained at the highest pitch of health"—a type of health service which civilisation happily denies to the rest of us The second expedition, in 1896–97, was to dig out Lepidosiren from its native mud and was entirely successful To ornithologists the book is specially attractive, conjuring up magnificent pictures of South American bird life

1 *Nature* 1950 165 4

Roentgen Diagnosis of Diseases of the Skull

MAX RITVO, M D, assistant professor of radiology Harvard Medical School London Cassell 1949 Pp 409 £5 18s 6d

THE standards of radiography and interpretation of films are often very different in neurological centres from the standards in general hospitals, where few but traumatic cases may be investigated A new textbook on the radiology of the skull may thus become a reference work for those who find skull pictures unfamiliar Dr Ritvo's book, one of an *Annals of Roentgenology* series in which a high standard has already been set, deals well with the questions of technique and normal anatomy The text throughout is excellent, though more detail might perhaps have been allowed to the sections on vascular markings, pressure changes, and the temporal bone It is good to see evidence of the author's close collaboration with his clinical colleagues In this branch of radiology, as he points out in his preface, such coöperation is vital Unfortunately the reproduction of many of the numerous illustrations is not so good as might have been expected Nor do the editors of the series seem to realise that it is impossible to dissociate changes originating in the bony structures of the skull from those which arise from cerebral pathological change The author evidently feels this, for a brief but well written section on cerebral angiography has crept in But there is no mention of other methods of examination of the cranial contents except statements—which some may consider sweeping—on the relative importance of air studies and angiography It is a pity that a book so well compiled should have been hampered by the limitations of its title

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The Eye and its Diseases (2nd ed Philadelphia & London W B Saunders 1949 Pp 1092 80s)—This important book, edited by Dr Conrad Berens, was first published 14 years ago and was at once recognised as a reference work of the highest class Its 92 authors, drawn from hospitals and universities in North and South America, Europe and Australia, give an international picture of ophthalmic medicine, and, to a lesser degree, of ophthalmic surgery Some of the illustrations are too small to be clear, while others are too faint The surgery of the eye has been condensed into 120 pages, which allows of only a few illustrations and perhaps this is the least useful part of the book but taken as a whole it is an outstanding work

Savill's System of Clinical Medicine (13th ed London Edward Arnold 1950 Pp 1198 35s)—Dr E C Warner, the editor, has made no great alterations in this new edition of 'Savill," but has arranged for much revision and the addition of some new chapters The twenty odd contributors have used the Savill approach, working from symptom to diagnosis via physical signs and not from a disease description to symptoms and signs The method has obvious advantages as well as certain drawbacks, and has long proved popular The new edition has in its 1100 pages a great mass of information, no wasted space, and not many illustrations Nevertheless it remains readable, and with comparatively few expensive plates and photographs it is offered at a relatively low price for so full a textbook

Acute Laryngotracheobronchitis (New York Grune & Stratton 1949 Pp 197 $5)—Dr A Harry Neffson believes that there is still much confusion about the group of conditions commonly called croup' The incidence, pathology bacteriology symptomatology, diagnosis, and differential diagnosis of this symptom complex are clearly discussed Special emphasis is laid on the characteristic features of supraglottic laryngeal œdema—a condition requiring a particular form of treatment promptly given Half the book is devoted to treatment, medical and surgical The complications of tension pneumothorax and mediastinal emphysema after tracheotomy are fully discussed The book contains much of interest to general practitioners, pædiatricians, and otolaryngologists

THE LANCET

LONDON SATURDAY, DEC 2, 1950

Field Work for Students

THE part of medicine that the student sees in a teaching hospital is obviously very important, but is not of course a fair sample of the whole The patients belong to selected groups and are isolated from their environment Our method has something in common with that of the naturalist who introduces the study of butterflies and moths by demonstrating his collection of insects displayed in cabinets—a collection doubtless containing some rare species but probably omitting nearly all the microlepidoptera so numerous in field and wood "Never mind," the teacher may say "one must proceed methodically, doing one thing at a time What we teach here is principles and skills, and the man with a solid foundation of hospital medicine can easily adapt himself to whatever medical circumstances he finds" Perhaps in former days this was true enough, but latterly the argument has carried less and less conviction Not only is it evident that the newly qualified are nowadays insufficiently equipped for immediate general practice, but also it is all too clear that many of them have lost the taste for it they once possessed COLLINGS [1] rightly concluded that "medical education at present tends to direct the student away from general practice" The student, as MACLEOD [2] puts it, becomes wrongly oriented towards such work, he tends to despise minor disorders, and probably feels guilty when he comes to practise without being able to apply the scientific methods he has been taught

BROTHERSTON [3] lays on hospital teachers some of the blame for lessening the prestige once attached to the family doctor's work, for during the students' impressionable years they are apt to make him regard the social medicine of general practice as an inferior substitute for the "real" medicine of the hospitals More and more teachers recognise this risk, and the remedy lies largely with them Few hospital teachers, however, have actually been in general practice, and even fewer feel that it matters more than their own specialty Would it not be wise then to ensure that the student throughout his clinical years is kept aware of the family doctor's work, either by taking part in it occasionally or at least by talks or lectures ? The Cohen Committee [4] did not approve of practitioners teaching in the hospital wards, or taking students on their domiciliary rounds and certainly it would be foolish, merely on the ground that "something must be done," to try to strengthen the hospital educational system by compulsory transfusion of blood from incompatible groups outside But in actual fact a little preliminary cross matching will prevent the more dangerous reactions, and in a number of schools a few lectures by a visiting practitioner have formed an innocuous and indeed popular part of the course At St Mary's Hospital not only are informal lectures given by a general practitioner but visits are arranged to allow students to see the set up of a general practice, and to meet and talk to the practitioner's allies—secretaries, dispensers, district nurses, M O H s, and district visitors An opportunity is given for the student to stay for a week with a general practitioner, to sit by his side in his consulting room, and to accompany him on his visits It is only a brief glance he gets of general practice, but he can take it at a time when he is still making up his mind which branch of medicine he would like to follow, and above all it gives him an idea, while he is still learning, of the uses to which he will probably have to apply his knowledge His interest is thus directed to those departments of the hospital less likely to provide him with examination subjects but more intimately linked with his future work

Describing a more ambitious scheme by which, at Boston, Mass, senior students spend a month working on the district and visiting people's homes, the Commonwealth Fund [5] says that the effect on the student is electric As the dean, Dr JAMES M FAULKNER, remarks,

> "it shows him that his previous training in the various medical and surgical specialties is partial and incomplete Even if all the information acquired in the individual courses is synthesised, it is still inadequate if it does not take into account the environment and the patient's reaction to it It seems highly desirable for the student to come to this realisation as an undergraduate rather than to rely on his finding it out for himself from experience in practice"

In Boston the district work is done among the sick poor under the auspices of a hospital, but even more might be learnt by working as an apprentice in an ordinary practice—a plan which, as Dr BABER [6] argues, would be good for the practitioner as well as the student A great deal of first class medicine is being practised all over this country, by able men, under good conditions built up by their own individual effort This tradition of fine service should be handed on to the younger generation early in their career, and a high standard of general practice should in this way be included automatically in their medical thought too many of our present family doctors remain apparently satisfied with poor conditions simply because they were not given a standard at which to aim during their early struggles It is encouraging therefore to hear that one of the London schools is considering whether a month's work with a practitioner could form part of the normal undergraduate course

Naturally, during the years when health centres have been regarded as the best means of restoring urban general practice, plans have been made for using them for teaching students A health centre close beside each undergraduate teaching school could serve as the field department of those who teach, explicitly or implicitly, the social side of medicine, and the practitioners on its staff might have a longed for opportunity of showing how practice can be conducted when conditions are favourable Since the days when we optimistically spoke of a "district with a population of perhaps 100,000 and

1 Collings J S *Lancet* 1950 i 555
2 Macleod D J *Universities Quart.* August 1949 see *Lancet* 1949 ii 1137
3 Brotherston J H F *Ibid.*
4 Training of a Doctor Report of Medical Curriculum Committee of B M.A London 1948
5 Commonwealth Fund annual report for year ending June 30, 1950 From 41 East Fifty-seventh Street New York.
6. Baber M.D *Lancet* 1950 i 833

containing half a dozen health centres" where students could see general practice at its best,[7] the sights of planners have been somewhat lowered Nevertheless, a great deal of effort and thought has been put into projected centres in Manchester, Birmingham, and elsewhere, where it is hoped that practitioners will join with each other and with the universities in giving the coming generation a new and better idea of general practice For the moment, however, these remain only projects, and meanwhile it is most valuable to have an account of "a teaching general practice" which already has a long history and is now in a phase of rapid development On p 695 Dr RICHARD SCOTT describes what is being attempted and done at Edinburgh, and, though the scale is small, readers must be impressed by the advantage to the student of seeing medicine practised as a whole, with the patients in more or less natural surroundings

Clouds over Rutin and "Vitamin" P

TROUBLE is no novelty to vitamin P—the very name hesperidin suggests disaster as well as hope, western isles, and lemons—but it will not easily live down the authoritative American decision to erase its name from the list of vitamins Rutin, a closely related substance whose properties may seem to the uninitiated hopelessly confused with those of ex-vitamin P, has never aspired to a place on the vitamin list beside its kinsman but is now in danger of being burnt on the same pyre

Vitamin P was introduced by SZENT GYORGYI [8] in 1936 Its active material, a flavone which he named citrin, was later shown to be a mixture of the glucosides of hesperidin and of eriodictyol Citrin was said to rectify increased capillary permeability in patients with non thrombocytopenic purpura and to prolong the survival of scorbutic guineapigs, but attempts to repeat these observations had conflicting results, even in the hands of SZENT GYORGYI himself [9] In the next few years SCARBOROUGH and STEWART [10] described the clinical picture of vitamin-P deficiency in man, and the minimum daily requirement of hesperidin was set as high as 3 g [11] Vitamins P and C are both constituents of citrus fruit and green vegetables, but the bleeding arising from deficiency of the two vitamins was said to be distinct Only rather scanty evidence of hesperidin's clinical value has been added in the subsequent ten years Deficiency of vitamin P is not easy to establish, because, as BICKNELL and PRESCOTT [12] point out, undue permeability of the capillaries occurs in various other conditions and is not known to be the primary cause of any form of purpura There are many possible fallacies—for example,[13] even a small effusion of blood into the subcutaneous tissues or the alimentary tract may increase capillary resistance for some days Then the methods of measuring capillary fragility have been criticised, and it is not clear how closely these measurements are related to clinical hæmorrhages In their report to the Council of Pharmacy and Chemistry of the American Medical Association, CLARK and MACKAY [14] question whether vitamin P has any vitamin like activity The Federation of American Societies of Experimental Biology goes further [15], on the grounds that neither its identity nor its activity have been fully substantiated, they recommend that the term vitamin P should be dropped altogether

The first mention of rutin in these columns was in 1946,[16] when this substance, a flavone obtained from buckwheat, was said to be useful in hæmorrhagic conditions associated with hypertension In cases of increased capillary fragility, as shown by Gothlin's technique, it was claimed that rutin would restore normal capillary resistance Its supposed action thus resembles that of vitamin P, though there has been no suggestion that rutin is an essential constituent of our food Since 1946, though it has been made and prescribed in this country, no convincing therapeutic successes with rutin have been published, but there have been some failures Thus LEVITT and colleagues [17] gave it to 12 diabetics with increased capillary fragility and retinal hæmorrhages and noted no apparent effect GLASS [18] has reported 5 cases of hereditary hæmorrhagic telangiectasia which were unchanged by two or three years' treatment with rutin, but their capillary resistances were normal throughout Another patient, with a lifelong history of bruising and abnormal capillary fragility, seemed to benefit from a six months' course of rutin

A reliable specific remedy is badly needed for hæmorrhage occurring in conditions with increased capillary fragility—the Henoch Schonlein and toxic purpuras, hypertension, and radiation sickness It was therefore well worth while to reinvestigate the pharmacological actions of rutin and similar flavonoid compounds occurring in plants In their report to the A M A, CLARK and MACKAY [14] describe investigations into the absorption and excretion of these substances Animal experiments by several workers had shown that when the substances are given parenterally they are excreted in the urine unchanged If therefore they are given to man and are appreciably absorbed, they should appear in the urine in due course, if they are not absorbed they should appear in the fæces or be shown to be destroyed by the intestinal flora The results of previous studies of excretion in man were conflicting, so CLARK and MACKAY began by repeating this work The recommended therapeutic dose of rutin was 60–120 mg daily by mouth CLARK and MACKAY gave normal volunteers single doses much larger than this—about 50 mg per kg of body weight—and could not detect any excretion of rutin or its metabolites in the urine, the same negative findings were obtained with methylated hesperidin chalcone, a related substance A patient who had had a gastric resection was known to absorb and excrete in the urine the anthocyanin pigment of beetroot, which is chemically allied to rutin, but when this patient was given 1 g of rutin by mouth there was again no detectable excretion in the urine In some volunteers the stools also were analysed, and even after these

7 *Ibid* 1947 i 229
8 Armentano L Bentsath A Benes, T, Rusznyak S Szent Györgyi A *Dtsch med Wschr* 1936 62 1325
9 Szent Györgyi A *Z physiol Chem.* 1938 255 126
10 Scarborough H Stewart C P *Lancet* 1938 ii 610 Scarborough, H *Ibid*, 1940, ii, 644
11 Scarborough H *Edinb med J* 1944 51 381
12 Bicknell F Prescott F The Vitamins in Medicine London, 1946, p 867
13 Scarborough, H *Brit med J* 1940 ii 916
14 Clark W G MacKay, E M *J Amer med Ass* 1950 143 1411
15 See *Lancet* Sept 30, 1950 p 464
16 Annotation *Ibid*, 1946 ii 16
17 Levitt L M., Cholst M R King R S Handelsman M B *Amer J med Sci* 1948 215 130
18 Glass W H *Ibid* 1950 220 416

massive doses the amounts of rutin recovered were insignificant This observation was explained when it was shown that if rutin is incubated with human fæces in water it is destroyed Experiments with rats and guineapigs confirmed that negligible quantities of rutin, citrin or other members of the group are absorbed from the intestine and excreted in the urine, but instead of being destroyed, as in man, the doses given to these animals could be recovered almost intact from the gastro intestinal tract It will be difficult, therefore, to dispute the American verdict of "no conclusive evidence available to substantiate the claims advanced for these drugs"

The Making of Florence Nightingale

A NEW cost-accounting system for the Army Medical Services was put into action between 1860 and 1865 In 1947 the Select Committee on Estimates found that it was still working admirably, though systems installed in other departments during the past 20 years had been discarded Who, they asked, had devised it? FLORENCE NIGHTINGALE, they were told It was just one of the countless things that incomparable amateur threw off How much influence she has had, and is still having, on our affairs will never be assessed, even in a detailed account of this close packed life Mrs WOODHAM SMITH[1] has been unable to do more than indicate the pies in which she had a useful finger We know that she cleared away an immense amount of rubbish in the Army Medical Department, that she was the first to give the soldier something more constructive to turn to, in his leisure, than the gin shop and the brothel, that she was the pioneer of sanitary reform in India (which she never visited) and that she gave some half dozen newly appointed Viceroys their "Indian education" before they set sail, that she was a much consulted authority on hospital construction, that she wrote, mainly anonymously, great numbers of pamphlets on hygiene and public health, and a vast work, never published, on Army hospital administration, that she was an exponent of record keeping and statistics, and a member of the Statistical Society, and, of course, that she founded modern nursing The maternal figure with the lamp is real enough (she even thought of herself as in some sense the mother of the dead at Scutari and the champion of their living brothers in the Army) but it is an abstraction which leaves out of account the powerful mind informed by years of first-hand observation and exact note taking, the prodigious memory, the ability to analyse great quantities of facts, the passion for figures, and a diligence far beyond the common.

Victorian England offered women no direct power all through her life she had to work through others—at Scutari through the doctors, and later through Ministers and other public men Since this never seemed strange to her (and, indeed, saved her a deal of scuffling in the arena), she was the opponent rather than the advocate of women's rights For she could never be brought to realise that her position was unique, indeed, it was among her more troublesome characteristics that she never thought herself out of the ordinary, and she often scolded her helpers, not for their lack of equal powers, but for their unwillingness to take trouble

In the famous letter of 1854, inviting her to take a party of nurses out to the Army hospital at Scutari, SYDNEY HERBERT wrote "There is but one person in England I know capable of organising and superintending such a scheme" He was right She was, as Mrs WOODHAM SMITH puts it, a weapon uniquely forged for the purpose But what had done the forging? Not long years of nursing training, certainly Though she was already 34, her nursing experience—apart from that offered by occasional illness in the family or village—dated from only 4 years before and had been, we should now think, decidedly sketchy In 1850 she had paid a visit lasting a fortnight to the 100 bed hospital of the Institution of Deaconesses, at Kaiserswerth, and in 1851 she spent a few summer months there working as a nurse The rest of her training consisted in visiting and minutely observing hospitals, almshouses, and infirmaries in whatever part of Europe she happened to be at the time, in studying her notes, and in extracting principles from them At last, only a year before she was called to the Crimea, she was appointed as superintendent (unpaid) of a small institution "for the care of Sick Gentlewomen in Distressed Circumstances", and there she completed—or developed—not so much her training as her single handed discovery of nursing

This, though it was not the forging, proves the quality of the metal Many natural gifts contributed to that quality she was well-born, well educated, intelligent, beautiful, and endowed with a charm that was always to win others to follow her lead Her family were much in society and as she grew up she moved among notable and responsible people It seemed certain that she would marry well and live the life of a successful society woman, by deliberately choosing otherwise she unwittingly ensured that the metal should be thoroughly tempered—in the fires and waters of Victorian family disapproval What holocausts, what cataracts these could be Mrs WOODHAM SMITH describes at length Miss NIGHTINGALE knew at 18 that she wanted to nurse For 16 years afterwards, until Scutari released her for a different feat of endurance, she bore the opposition, reproaches, and counter claims of her parents and sister, and, worse than all these, her own sense of guilt All her life she was deeply religious, and for most of those 16 years she believed that in opposing her family she was failing in her duty to God She strove to submit, to bear patiently the daily round of gossip and visiting, of listening to papa reading scraps from the newspaper, of arranging flowers and taking a little drive It would not do, rebellion smouldered in her, and when the time came burned with a clear flame

The patience she learned in those frustrating years stood by her It gave her the strength, while men died neglected round her, to hold herself and her nurses in check until the resentful doctors would grant them the right to enter the wards, it taught her to endure the obstructions of such men as Sir JOHN HALL, chief of medical staff, who did all he could to ruin her work (THOMAS WAKLEY, editor of *The Lancet*, had crossed swords with HALL a few years before, in the matter of a soldier who died after a

1 Florence Nightingale By CECIL WOODHAM SMITH London. Constable 1950 Pp 615 15s

flogging) For weeks the work she had come to do was withheld from her , she schooled herself to use her abilities in other directions Thus she became "purveyor" to the Army, supplying—out of funds put at her disposal from England—drugs, surgical instruments, baths, hot-water bottles, and medical comforts from which the wounded were debarred by Army red tape and an obsolete system In the end, as we know, she achieved her object, and changed the whole miserable scene of Army nursing , but she did it in the face of continual opposition

There are limits to the amount of frustration the human spirit can bear , and we should nowadays say that she came back from the Crimea with a neurosis But, like CHARLES DARWIN's,[2] it was a neurosis curiously useful for the rest of us DARWIN had to spend half his day resting in order to get through his work , MISS NIGHTINGALE had to work all day and half the night in order to rest at all After the war everyone was ready for a holiday , she was not, she was burning for reform The more her family and friends—even the devoted SYDNEY HERBERT—urged her to take a holiday the more restive she became, and at last she fell ill That illness, with variations in intensity, was to last many years and serve her purposes exceedingly well It seems to have taken the form of physical weakness, inability to eat, severe palpitations, breathlessness, insomnia, and fainting attacks—a collection of symptoms which, when no organic cause can be found, is always being given new names That organic disease was absent in MISS NIGHTINGALE's case seems clear from the fact that she lived to be 90 , but throughout her middle years she and her friends believed that she was dying, and the end was expected at any time This had many advantages it enabled her to rest physically while she grappled with the mental toil she imposed on herself , it allowed her to refuse all invitations and to deny herself to any callers who might waste her time , it restricted her to the society of enthusiasts for her causes, and licensed her to drive them hard (was she not driving herself to her death ?) , and above all it protected her from her family Any threat of a visit from her mother or sister provoked one of her "attacks" , this was her only safeguard—not the less humiliating because it was unconscious—against a return of the old emotional tyranny She came home from the Crimea in 1856 , by 1857 she was a chronic invalid and hard at work

Time alters patterns In 1880 her mother's death finally freed the 60 year old MISS NIGHTINGALE from all demands except those of her own undeserved self reproach But she began at last, slowly, cautiously, to savour her independence , and the generous nature which had so long expressed itself in great public causes was eventually able to flower in personal relationships with a wide company of friends, many of them young people The prosperous Nightingale School of Nursing, founded at St Thomas's 20 years before, gave her active brain scope, the young nurses gave her warm affection and loyalty Her health improved, she went about more, and the thin faced forceful witty invalid of the middle years became the buxom humorous old lady of the late portraits Do we see there what nature intended her to be if her family had been equal to her needs ? But what then would have become of the passionate fighter ? It is hard, in retrospect, to regret anything that went to the making of FLORENCE NIGHTINGALE

2 See Hubble, D *Lancet*, 1943, i, 129

Annotations

CULTURE OF MALARIA PARASITES IN VITRO

THE growth and development of living cells largely depends on their chemical and physical environment being correct If the scientist knew enough to provide and maintain such an environment, any cell or part of a cell could presumably be cultured in vitro for ever Some organisms are less exacting than others in their requirements Thus free living amœbæ will flourish in a drop of dirty rain water, and fibroblasts from a chick embryo will multiply indefinitely in a simple salt solution with the addition of serum and embryo extract But many parasites, such as viruses, rickettsiæ, and some protozoa, normally grow only inside living cells and so are accustomed to a very special and complex environment which the biologist can imagine but cannot yet define or reproduce Hitherto, none of these obligate intracellular parasites (except a few bacteria) have been cultivated outside their particular host cells Now, however, Trager[1] has persuaded one of the more delicate of these parasites, *Plasmodium lophuræ*, the organism of bird malaria, to develop for several days outside the red blood cell in which it is accustomed to live

As may be imagined, both the procedure and medium are highly complex, but the salient points may be simplified *P lophuræ* normally grows inside duck's red cells The first step in its cultivation outside these cells is to free the parasites from the red cells as gently as possible , this is attained by haemolysing the red cells with specific antiserum The parasites are received into a complex salt medium containing most of the known vitamins and growth promoting compounds, together with glutathione, hexose diphosphate, yeast adenylic acid, and cozymase, and having a high potassium sodium ratio This is mixed with a concentrated extract of red corpuscles to supply the nutrients and labile enzyme systems to which the parasite is accustomed in its intracellular existence The pH is adjusted to 6 75—7 0 , slightly on the acid side of neutrality—and an atmosphere of air plus 5% CO_2 is provided Apparently it is important to give the parasite some supporting physical framework to act like scaffolding, and this is done by adding gelatin, which at 30°C combines with the red cell extract to form a scum of the right density and structure The other essential chemical constituents include adenosine triphosphate and sodium pyruvate Throughout the manipulations great consideration must be shown to the parasites, and the fluid medium must be changed every 12 hours By these means, Trager has maintained the development of all the parasites, outside their host cells, for at least two days The first generation of parasites mature to schizogony, and new merozoites liberate themselves and begin the second stage of the cycle by developing into fresh trophozoites On the third day most of the free parasites are still normal in appearance, but by the fourth day more of them are degenerate and by the fifth day there are very few normal parasites left

We must conclude that Trager has not yet completely reproduced the complex environment existing inside a red cell But his results would have seemed unbelievable a few years ago This triumph of biochemical knowledge and technical skill will be an inspiration to those who are studying the intricate chemical and physical systems of living organisms in general, and of malaria parasites and red cells in particular

1 Trager W *J exp Med* 1950 92 360

EPIDEMIOLOGY OF DIPHTHERIA

DURING the late war diphtheria was pandemic in continental north west Europe In North America, however, the long phase of exceptionally low incidence was undisturbed, and in Great Britain the perennial toll of the disease diminished during the period of its greatest prevalence on the Continent To elucidate the causes of these diverse patterns, Prof J W McLeod, F.R.S [1] (to whom the differentiation of the cultural types of *Corynebacterium diphtheriæ* is due), has examined the various contributory factors during the years between 1926 and 1946 Urbanisation, as in Great Britain, begets a continuously high incidence, and, especially during epidemics, the parallel phenomenon of natural immunisation through subclinical infections Further more, in war time the migration of civilians or infiltration of foreign armies from zones of severe epidemic diphtheria must be taken into account But apart from these environmental factors, to what extent have prophylactic inoculation and the prevalent cultural type of *C diphtheriæ* controlled the development and course of epidemics?

In North America prophylactic inoculation has for many years been carried out on an immense scale, and this has undoubtedly been important in producing the very low incidence in that region [1] Immunisation has likewise contributed to the fall in incidence in Great Britain from 1942 onwards Nevertheless, before the late war Norway, Denmark, and Holland had a very low incidence to which inoculation contributed little or nothing, and McLeod believes that natural immunisation during epidemics played an important part Why, then, should the incidence in these countries have risen to epidemic proportions during the war? The short answer is that virulent types of *C diphtheriæ* "appeared" and upset the parasite host equilibrium attained after infection with less virulent types In Norway and Denmark, as in the U S.A, gravis strains were absent or rare during the inter war phase of very low incidence, and in Amsterdam the mitis strain predominated for many years, until, during the war, intermedius and, later, gravis strains appeared and a formidable epidemic resulted. It seems possible that these virulent strains were introduced by German invaders, just as an isolated epidemic of gravis diphtheria in Halifax Nova Scotia, has been ascribed by some to the arrival of Norwegian sailors On the other hand, McLeod shows that during the inter-war years "epidemic spikes" in British cities were commonly associated with a predominance of intermedius or gravis strains, and there is no reason to believe that these strains were imported. It may be, he suggests, that "several independent varieties of *C diphtheriæ* exist each of which produces a distinctive though similar type of disease", but because intermedius so often precedes gravis strains before and during epidemics, McLeod suggests that their may be a recurring cycle of evolution "in which the different forms described represent merely phases" Thus at fairly long intervals, under some unknown stimulus, mitis may mutate to intermedius, and this, linked by a subtype, to gravis which, similarly linked, ultimately reverts to the mitis phase

However this may be, it is clear from the experiences of Norway and neighbouring countries that gravis strains can break down the barrier of natural immunisation, and the Nova Scotia epidemic, the high incidence of diphtheria among American troops exposed to gravis infection in Europe, and the studies of gravis diphtheria in Gateshead and Dundee [2] show that prophylactic inoculation does not necessarily provide a sure shield against this strain But whereas among the uninoculated gravis infections often prove fatal, among the inoculated deaths are rare McLeod "cannot over-emphasise" this (Similarly, Hartley, Tulloch, and their colleagues [2] insisted on the "paramount importance" of prophylactic inoculation in the reduction of mortality from gravis diphtheria) McLeod believes that an immunisation-rate of 70–90% may prevent the development of a severe gravis epidemic, and that this is possibly the secret of the very long periods of negligible incidence in American and Canadian cities

THE BRITISH LEGION VILLAGE

"Independence is the only real defence against disability," as the *Times* [3] said not long ago The British Legion have kept this principle constantly in mind, and nowhere more than in the village and reablement centre for the tuberculous which they founded near Maidstone twenty five years ago [4] Since then over 10,000 men and women disabled by the disease have either been reabled and passed out of the centre—many of them fit to return to normal industry—or have found homes in the village colony where they have contributed their share of the country's production in the workshops founded there to give them employment There is nothing dilettante about these industries since the village was founded, in 1925, £1,270,000 has been paid out in wages, while the value of the industrial output has been £2,190,000 The main productive industries are carpentry, printing, and the making of fancy goods (by the severely disabled) But the village itself naturally provides many other occupations for reabled patients who are training for a return to ordinary life Thus the engineering department is busy with reconstruction and improvements in the village property—putting in hot water systems, wiring for electrical equipment, and so on—and the building and maintenance department is continuously engaged in repairs, reconstruction, and painting and decorating for the industries and village The transport department, with lorries, vans, and cars, can offer a good course of training for those who aim to become motor mechanics

After the 1914–18 war a vocational training centre for tuberculous ex Servicemen who had completed their sanatorium treatment was established at Preston Hall, the big Victorian mansion which presides over the village and nowadays houses the administrative centre The village settlement grew up round it, and the original 50 beds for patients had increased, by 1948, to 926, some of them in three pavilions, built in the course of the years, some in the E.M S hospital set up in 1939 and attached to Preston Hall, and some in a convalescent home at Bournemouth and the Nayland Sanatorium for Women, near Colchester Instead of the one hostel and 25 houses, put up in 1926, the village can now boast of 136 houses or bungalows It has its own village stores and post office, and a cafe registered as an industrial canteen and run by the catering department In 1948 the hospital, sanatorium, and convalescent homes were transferred to the National Health Service, but the village and the reablement unit remained under the Legion The Minister expressed his firm wish that all should still work as a unit and so they do

The reablement side is very largely run for the tuberculous by the tuberculous of an administrative staff of 45 no less than 40 are recovered or recovering patients —a very great encouragement to newcomers The village children live the same life as other village children—but have the strange privilege of being less likely (so the figures show) to catch tuberculosis than the common run During the 1939–45 war 104 sons and daughters of tuberculous ex Servicemen served in the Forces, and none of those who returned had contracted the disease

The jubilee year of the village comes at a time when plans for further extensions are in the air, and indeed

1 McLeod J W. *J Path Bact* 1950 62 137
2 *Spec Rep Ser med. Res Coun, Lond* no 272 See *Lancet* July 22, 1950 p 139
3 May 29 1950
4 Silver Jubilee The Record of a Quarter of a Century of Treating Training and Rehabilitating Ex Service Men and Women The British Legion Village Maidstone Kent

rapidly coming down to earth Relieved of the responsibilities of the hospital, sanatorium, and convalescent home, the British Legion can now direct their energies to the training and resettlement of the ex Service tuberculous and they hope to offer apprenticeships for posts in normal industry commanding good salaries and prospects of promotion Success in this project, they say, must depend on the support of every branch of the Legion, and all the other friends of this work

CONTROL OF RABIES

THE administration of hyperimmune serum followed by a course of vaccine seems to hold great promise in the treatment of rabies in man, and in early trials satisfactory results have been obtained with avianised vaccine, containing active virus modified by passage in the chick embryo A vaccine of high potency is also obtained when the virus is inactivated by irradiation with ultraviolet light This was the opinion of the W H O Expert Committee on Rabies when it held its first session in Geneva last April [1] A field trial is to be made in Iran, where wolves still roam widely and severe bites from rabid animals are common Discussing the control of rabies in animals the committee emphasised the value of annual vaccination of all dogs in enzootic areas, now that vaccines are more effective It is hoped that W H O will be able to carry out large scale field demonstrations of the value of regular immunisation Furthermore, "experience has shown that the efficient organisation of a rabies control programme in an infected area is best accomplished by means of a central authority headed by a public health officer, preferably a veterinarian, who has full executive power and who devotes his full time to this work"

Other livestock bitten by rabid carnivores are unlikely to propagate the disease Exposed animals can be safely slaughtered for meat within one week of the bite or after six months The greatest risk is encountered, not through consumption of meat or milk from infected creatures, but by those who handle the live animal or the carcass

ACUTE BENIGN PERICARDITIS

AT the time of the year when upper respiratory infections abound, the onset of a pain in the chest does not always point to the heart Yet it is in just these circumstances that acute non specific pericarditis is apt to occur, and for the same reason, this diagnosis is probably more often missed than made This is partly the fault of medical writers, few of whom have given the condition more than scanty recognition

The onset is usually acute, with pain, an initial pericardial rub, a raised erythrocyte sedimentation rate, and fever which may last for several days Though the pericardial fluid is sufficient to alter substantially the cardiac X ray silhouette, tamponade effects are not prominent, and therapeutic aspiration is seldom necessary The fluid may be bloodstained but is sterile on culture Typical but transitory electrocardiographic changes of pericarditis accompany the illness Recovery is rapid—though occasionally there is a relapse—and chronic constrictive pericarditis does not follow As Feder et al [2] point out, the condition may be passed off as a cold or pleurisy, but when its symptoms are more severe and pain is dominant there may be difficulty in distinguishing it from coronary occlusion or some acute abdominal disorder The pain of pericarditis, however, is often exaggerated by deep breathing, coughing, or motions of the trunk, or by swallowing, and other features which help to differentiate it from that of coronary thrombosis are the early incidence of a widespread pericardial rub, an initial fever and raised E S R, the absence of abnormal Q waves and of reciprocal R–T changes in leads I and III of the E C G, and the history in many patients of a pre existing upper respiratory infection Acute benign pericarditis is distinguished from acute rheumatic pericarditis by the absence of joint pains, a normal P–R interval in the E C G, and a shorter clinical course [3]

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PREFRONTAL LEUCOTOMY

SINCE Moniz first essayed destruction of the white fibres in the forepart of the frontal lobes in 1935, increasing attention has been directed to the results of an operation which, since it is directed at the brain, in the absence of gross organic disease, has aroused almost as much anxiety as it seeks to allay

Reports of the results in small groups and in large groups, with this cut and that cut, are pouring into the medical and also the lay press, but in recent years their assessment has been complicated by wide variation in technique One of the merits of a book by Dr Maurice Partridge [4] is that it surveys 300 cases, all operated on by Mr Wylie McKissock with the same technique, and almost all followed up, six months, twelve months, and two years after the operation Manic depressive insanity, depressions without mania, schizophrenia, and obsessional neurosis accounted for 273 cases

Partridge's conclusions on the whole confirm those of others Manic patients do badly, and so do patients who have had frank manic attacks operated on while they are depressed, depressives of good previous personalities do well, and so do obsessionals, even 5 atypical obsessionals did surprisingly well It is less easy to summarise the results in 157 cases of schizophrenic illness a sustained recovery in about a quarter of 35 cases with affective colouring, and in about a fifth of the cases with histories of remissions, is encouraging when one considers that operation almost always followed active therapy with insulin and electroplexy A recovery rate of only 8% in cases without remission or affective colouring seems poor in comparison, but some of the remainder were much improved in conduct and therefore became less difficult to nurse, or were able to be discharged, though still psychotic Partridge faces the fact that many could be described as psychopathic this, in his view, does not prevent success, though it calls for keener aftercare He admits that nearly all his patients showed some deficits (With some of the newer techniques such deficits seem to have been reduced) On the other hand, in the relief of having the patient home again, relatives seem able to tolerate handicaps which—were affection absent—must give rise to dismay or chronic ill temper The results in these 300 cases do not warrant uncritical enthusiasm, but their analysis offers evidence on which the standard operation can be judged

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3 Evans E *J Amer med Ass* 1950 143 954
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RECORD SYSTEM

In the record system which has lately been put into operation there are five elements

1 The *registration card*, which is completed (usually by the almoner) when the patient first registers, and which shows name age, date of birth identity number date of joining the practice, and previous doctor

2 *The patient s medical record*—This consists of a quarto manilla folder containing the actual medical case sheet and any relevant medical documents (e g specialists and laboratory reports) which are in use The medical case sheet is merely the National Health Service medical record card (form E C 8) slightly modified and printed on quarto paper The manilla folder is printed on both sides On the left (p 1) are recorded the patient s name address, occupation, age birth rank, and previous medical history, with space for the doctor to record the results of systematic physical examinations The right-hand side (p 2) is intended for a summary of the patient s illnesses after he joins the practice

3 *The family record folder*—This folder, of foolscap size is filled numerically according to the family index number It contains all the family s records together with any further information about each member which is not actually in use in the individual s medical record folder

4. *Records made by the nurse* (e g, antenatal records or records of children who attend the baby clinic or child welfare sessions) are at first filed in the individual s medical record folder After they have served their purpose they are filed separately but an indication that the record exists is given on p 1 of the individual s medical record card The almoner keeps her own record of any work she does with a family This also is filed separately but the existence of the record and the nature of information it contains is also indicated on p 1 of the individual medical record card

5 *Referral Cards*—When a member of the team has been allotted a specific duty (particularly at the case-conference) a small card is made out indicating the job to be done and the person who is to do it He or she enters relevant data on the card which may itself act as a method of recording it may show, for example, how often a particular item of service was required.

TEACHING

We accepted our first students in October, 1948, and hitherto 62 have been given a three month course At Edinburgh, each 'year' has on average 200 undergraduates At present we can take no more than 10 or 12 per term—up to, say 40 a year—and applicants, who must be in their last or penultimate year of training, have always been more numerous than vacancies

In undergraduate teaching our primary concern is to illustrate the social aspects of health and sickness If, in the process, we have to digress to discuss a technical point in clinical diagnosis and treatment that is incidental.

The student's instruction is in three phases First, he observes the family doctor at work. Secondly, he is introduced by the doctor to a number of patients as the doctor s (student) assistant, and as an apprentice takes over delegated responsibility for diagnosis and treatment Lastly, by means of seminars and case-conferences, he gains insight into the significance of what he has seen and heard in the course of his practical work

The students attend as a group once a week In addition, each student is allotted a particular consulting hour once a week during the ten-week term Only one student at a time is with the doctor in the consulting-room, where he quickly learns to fit into the background. He is introduced to the patient as a senior student giving the doctor clerical help while at the same time being under instruction The patient knows that he has a right to see his doctor in privacy, and if the patients insists, the doctor will ask the student to withdraw or arrange to interview the patient at another time This seldom happens, but causes no embarrassment when it does For his first few sessions the student is mainly an observer, but he gradually comes to know and to be known and finally accepted by a number of patients By mid term he has a small "practice" of some half dozen patients, by whom he is identified as the doctor's assistant and he engages, under supervision, in the diagnosis and treatment of these patients in their own homes and at the consulting room, having all the resources of the team at his disposal A second consulting room and a side room are available to him at the dispensary, so that he can see his own patients by appointment at their and his convenience From this small group he selects a family to present at the end of term

At the first of the group meetings—i e, on the first day of term—the students are reminded of the ethics which govern the doctor patient relationship and of their privileges and responsibilities as medical students They are introduced to the staff and given a brief account of the family-doctor team At the second meeting we deal briefly with administrative topics, such as certification and prescribing, relating mainly to the National Health Service Act At the next meeting, usually taken by the almoner, the students are introduced to some of the more important statutory and voluntary social agencies By this stage the students themselves are beginning to provide questions for discussion, and an attempt is usually made to contrast hospital and general practice At mid term the students are provided with the outline of a scheme of social case-taking which is illustrated by the completed case-report of one of their predecessors In the remaining sessions each student presents to the group an account of the medical and social circumstance of an entire family which he has treated He is invited not only to outline the medical and social therapy he has been able to prescribe but also to catalogue the items he would like to prescribe were he omnipotent All the staff are present at these seminars and are ready to answer questions and to illustrate and amplify the major points evoked by the discussions

THE FAMILY CLUB

The dispensary premises include a moderate sized hall, capable of seating in comfort some 120 people, which has a fitted stage and a cinema screen Originally this was built and used as a lecture room for medical and pharmaceutical students

In January, 1949, using a 16 mm sound projector and films borrowed from the Central Film Library, we began a series of monthly film shows to which all our patients were invited The films were documentaries prepared for popular health propaganda by the Ministry of Health the Ministry of Information, and the Central Council for Health Education We also showed films illustrating the development of community centres, including the Peckham documentary *The Centre* At these meetings discussion and questions were invited

The response was slow at first but in April 1949 half a dozen patients volunteered to constitute the nucleus of a social club Within three months the club had been formed, had adopted a constitution, and

The practice is on the fringe of one of the most over crowded slum areas of the city Problem families, the very poor, and residents of nearby common lodging houses, on arriving in the neighbourhood, will tend to gravitate towards the practice Almost all other recruitment will be by the transfer of patients from the lists of other doctors in and around the area So far, while keeping very strictly within the bounds of ethical propriety, we have simply accepted any patient who wishes to join or transfer to our list Despite the competitive element inherent in the capitation system of payment, the growth of the practice has not so far embarrassed our relations with local practitioners, with whom we might be said to be competing unfairly

This, however, has been one of the many factors in estimating the optimum size of the practice It has been decided that the number of patients should never exceed 2000 and the optimum be rather smaller Should we now deliberately select those for inclusion in the list from the further applications received ? The statistician's concept of a perfect vertical cross section of society is purely theoretical, and any attempt to create such a sample with 2000 people registered with the same general practitioner would be futile At the same time there are advantages in having access to a reasonably representative community, and it is therefore proposed that in filling the remaining vacancies we should have regard to such factors as age, sex, marital states, housing, and occupation The one sine qua non is that in discussing our findings (e g, morbidity indices) we should always know "who is present"—i e, the population at risk

Apart from geographic considerations, the only other major factor influencing further recruitment is that for traditional and ethical reasons we must always accept the chronic sick, the very poor, the irresponsible, and the nomads who have difficulty in getting on to the list of already overworked doctors Though the practice will inevitably be weighted as far as these groups are concerned, it will be a much more heterogenous community than the clientele of the dispensary before 1948 Under *the old régime, the dispensary gave a personal service to individuals* It is hoped that eventually the practice will include, for the purposes of long term studies, some 400 complete *families.*

STAFF

In staffing the practice the assumption has been that it is no longer possible for one doctor to provide his patients with a complete service With increasing specialisation final diagnosis and treatment rests increasingly often with a hospital department, and similarly in the social services the patient is referred to one of an ever increasing number of specialised agencies, about which the general practitioner often knows little and over which he seldom has any control

Under the Montefiori system in New York, the hospital consultant, reinforced by paramedical and social workers, goes out from the hospital into the patient's home carried to its logical conclusion, this method would in the end annihilate general practice Our approach is the exact antithesis of this We are attempting to reinforce the general practitioner with additional skills and techniques, including the "use" by him of consultants, so that more and more the investigation, assessment, diagnosis, or treatment of the patient is coördinated and controlled by him In this practice the family doctor has been replaced by a team, the aim is that while each member should practise a different skill, all should be integrated to function as a single unit This family doctor team tries to treat people—or rather families—rather than diseases The core of the team is the doctor and a social worker (almoner) It also includes a nurse (who has additional qualifications and experience in midwifery and local authority health visiting), but the nurse, while she has a special contribution to make, uses a skill that is essentially the same, except in degree, as that of the doctor The almoner, on the other hand, does work outside the scope of both doctor and nurse

ROUTINE

Except in an emergency, only those registered as patients of the practice are seen at the dispensary Consultations are held twice daily except on Sundays Requests for home visits are received either at the dispensary or at the doctor's house All domiciliary visits are paid, in the first instance at least, by the doctor himself The consultations at the surgery are conducted by the doctor or his assistant At the morning surgery the nurse is always present She also has a daily session in the late afternoon, at which she does dressings, gives injections, and sees patients referred to her by the doctor For the rest of the day she acts as a district nurse and health visitor (as far as our own patients are concerned), doing domiciliary visits The almoner sees patients during the morning consulting hour and at other times by appointment The pharmacist attends during the consulting hours The chiropodist and the dentist attend twice weekly to see patients by appointment

The midwifery arrangements are as follows Because of housing, most patients are delivered in hospital If a patient cannot or will not arrange to be delivered in hospital she is delivered at home by the doctor, the midwife being supplied by the usual arrangement with the local authority (As our nurse is engaged in general nursing she cannot be employed as a midwife or maternity nurse) Whether the expectant mother is to be delivered at home or in hospital, we undertake antenatal supervision, even if, in the case of women to be delivered in hospital, this causes some duplication One afternoon session is held weekly with the doctor and nurse present, when appointments are made for routine antenatal supervision, postnatal examination, and advice As soon as the child is born, the nurse is notified and the mother is invited to attend a mother and baby club which is held on one afternoon a week This fulfils the function of a child welfare clinic, except that only our own patients attend, routine weighing, examination, vaccination, and immunisation are offered The nurse always attends these sessions, and the doctor is available

THE DAILY CONFERENCE

A staff meeting is held daily (except for Sundays) and is always attended by the two doctors, the nurse, and the almoner This, in my view, is the most important single item of our routine The primary object of this meeting is to integrate—or rather to create—a team by means of joint discussion The conference, which lasts on average from a half to three quarters of an hour, has two facets First, each member gives a brief account of his or her contacts with patients or with medical or social agencies Secondly, there follows a discussion of any problems arising from this exchange of information, along the lines of a case conference The doctor acts as chairman, and each member is free to give his opinion or comments The object is to review all that is known of the medical and social circumstances of a particular patient against his family background to reach a working diagnosis of the family situation, and to evolve a régime of therapy which will satisfy the patient's immediate needs and will at the same time be sufficiently well defined to ensure that the team works to a common pattern in future contacts with other members of the family, and yet sufficiently elastic to allow of modification in the light of new knowledge about the family or changes in its circumstance At this conference the role of each member of the team in

the treatment of a particular patient is decided The wishes and attitude of the patient of course greatly influence this decision

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In the record system which has lately been put into operation there are five elements

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2 *The patient's medical record*—This consists of a quarto manilla folder containing the actual medical case sheet and any relevant medical documents (e g, specialists and laboratory reports) which are in use The medical case sheet is merely the National Health Service medical record card (form E C 8) slightly modified and printed on quarto paper The manilla folder is printed on both sides On the left (p 1) are recorded the patient s name, address, occupation, age, birth rank, and previous medical history, with space for the doctor to record the results of systematic physical examinations The right-hand side (p 2) is intended for a summary of the patient s illnesses after he joins the practice

3 *The family record folder*—This folder of foolscap size, is filled numerically according to the family index number It contains all the family s records, together with any further information about each member which is not actually in use in the individual's medical record folder

4 *Records made by the nurse* (e g, antenatal records, or records of children who attend the baby clinic or child welfare sessions) are at first filed in the individual's medical record folder After they have served their purpose they are filed separately, but an indication that the record exists is given on p 1 of the individual s medical record card The almoner keeps her own record of any work she does with a family This also is filed separately but the existence of the record and the nature of information it contains is also indicated on p 1 of the individual medical record card

5 *Referral Cards*—When a member of the team has been allotted a specific duty (particularly at the case conference) a small card is made out indicating the job to be done and the person who is to do it He or she enters relevant data on the card, which may itself act as a method of recording it may show, for example, how often a particular item of service was required

TEACHING

We accepted our first students in October, 1948, and hitherto 62 have been given a three month course At Edinburgh, each "year" has on average 200 undergraduates At present we can take no more than 10 or 12 per term—up to, say, 40 a year—and applicants, who must be in their last or penultimate year of training, have always been more numerous than vacancies

In undergraduate teaching our primary concern is to illustrate the social aspects of health and sickness If, in the process, we have to digress to discuss a technical point in clinical diagnosis and treatment, that is incidental

The student's instruction is in three phases First, he observes the family doctor at work Secondly, he is introduced by the doctor to a number of patients as the doctor s (student) assistant, and as an apprentice takes over delegated responsibility for diagnosis and treatment Lastly, by means of seminars and case conferences, he gains insight into the significance of what he has seen and heard in the course of his practical work

The students attend as a group once a week In addition, each student is allotted a particular consulting hour once a week during the ten week term Only one student at a time is with the doctor in the consulting-room, where he quickly learns to fit into the background He is introduced to the patient as a senior student giving the doctor clerical help while at the same time being under instruction The patient knows that he has a right to see his doctor in privacy, and if the patients insists, the doctor will ask the student to withdraw or arrange to interview the patient at another time This seldom happens, but causes no embarrassment when it does For his first few sessions the student is mainly an observer, but he gradually comes to know and to be known and finally accepted by a number of patients By mid term he has a small "practice" of some half dozen patients, by whom he is identified as the doctor's assistant, and he engages, under supervision, in the diagnosis and treatment of these patients in their own homes and at the consulting room, having all the resources of the team at his disposal A second consulting room and a side room are available to him at the dispensary, so that he can see his own patients by appointment at their and his convenience From this small group he selects a family to present at the end of term

At the first of the group meetings—i e, on the first day of term—the students are reminded of the ethics which govern the doctor patient relationship and of their privileges and responsibilities as medical students They are introduced to the staff and given a brief account of the family doctor team At the second meeting we deal briefly with administrative topics, such as certification and prescribing, relating mainly to the National Health Service Act At the next meeting, usually taken by the almoner, the students are introduced to some of the more important statutory and voluntary social agencies By this stage the students themselves are beginning to provide questions for discussion, and an attempt is usually made to contrast hospital and general practice At mid term the students are provided with the outline of a scheme of social case taking, which is illustrated by the completed case report of one of their predecessors In the remaining sessions each student presents to the group an account of the medical and social circumstance of an entire family which he has treated He is invited not only to outline the medical and social therapy he has been able to prescribe but also to catalogue the items he would like to prescribe were he omnipotent All the staff are present at these seminars and are ready to answer questions and to illustrate and amplify the major points evoked by the discussions

THE FAMILY CLUB

The dispensary premises include a moderate sized hall, capable of seating in comfort some 120 people, which has a fitted stage and a cinema screen Originally this was built and used as a lecture room for medical and pharmaceutical students

In January, 1949, using a 16 mm sound projector and films borrowed from the Central Film Library, we began a series of monthly film shows to which all our patients were invited The films were documentaries prepared for popular health propaganda by the Ministry of Health, the Ministry of Information, and the Central Council for Health Education We also showed films illustrating the development of community centres, including the Peckham documentary *The Centre* At these meetings discussion and questions were invited

The response was slow at first, but in April, 1949, half a dozen patients volunteered to constitute the nucleus of a social club Within three months the club had been formed, had adopted a constitution, and

had begun to hold regular meetings in the hall The aims of the club are

1 To further the well being of its members, to promote family health, and by common effort to foster a community spirit

2 To manage and maintain a community centre

3 To provide social, educational, and cultural activities, both indoor and outdoor, among its members

The development of the club has been slow for two main reasons First, only patients can be members, the staff may participate, but may not have executive authority Secondly, the club, although it has the hall free of rent, needs funds for its development This is one of the activities to which the board of managers will be able to lend material support when their legal position has been clarified Hitherto the club's activities have included a weekly social (average attendance 40–50), a boys' section (5–15 years) and a girls' section (5–13 years) each of which has met once a week during the winter, two motor coach outings, a children's Christmas party and an entertainment for some 120 old people on the club's roll, arranging for members confined to bed at home or in hospital to be visited, and running an adult beginners' class in Scottish country dancing Members of the club arrange to brew tea for the mothers during the baby clinic sessions

Although we have in fact no more than the outline of a club, the few really active patient members will almost certainly keep the notion alive until expansion is possible The strength of the movement is due to members being allowed to manage their own affairs, make their own mistakes, and experiment We hope that the club will enable us to keep in touch with "patients" requiring care and attention, and that it will in fact become a family club after the fashion of Peckham, paving the way to systematic periodic family health overhauls

SUMMARY

A general practice has been developed by members of a university department—two doctors, an almoner, a nurse, and a dentist

In this practice an attempt is being made to bring together all the necessary skills and to integrate these in such a way that the whole person is treated

A limited number of senior medical students are enabled to serve an apprenticeship

It is a pleasure to acknowledge my indebtedness to Prof F A E Crew, F R S, head of the department, without whose inspiration and support the work could not have been undertaken My thanks are due to my departmental colleagues and particulary to the following who have worked hard and patiently with me in the practice Jane E Paterson M A, Gwen Padfield, S R N, W J Abel, M B, and J N Mansbridge, H D D Mr B Woolf, PH D, has given much helpful advice on the design of records I must also acknowledge the coöperation, which I have enjoyed from the beginning of the managers of the Royal Dispensary, one of whom, Mr Eric Knott, M P S, has acted as our honorary apothecary

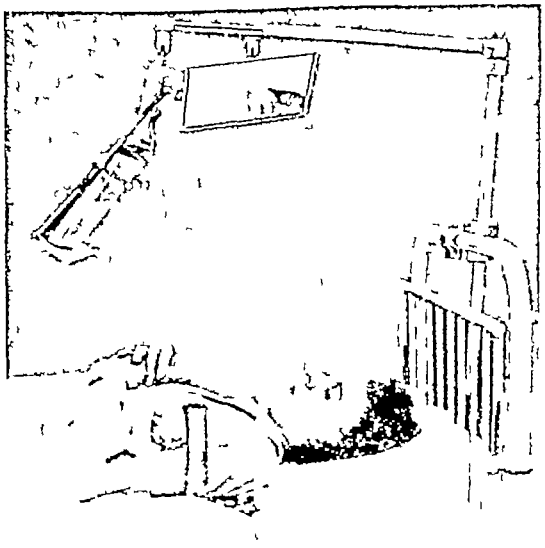
AN AID FOR SUPINE BED PATIENTS

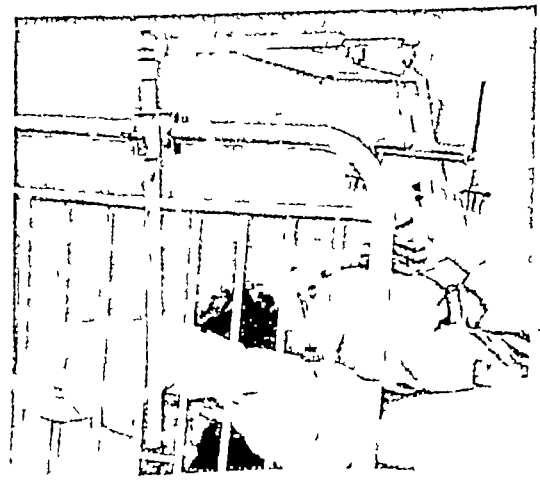
J J SUMNER
M C, M D Durh
CHIEF ASSISTANT, HAREFIELD HOSPITAL, MIDDLESEX

ADULT patients being nursed in a complete supine posture on a Jones spinal frame or a plaster of paris posterior shell for long periods experience difficulty and frustration in reading, writing, washing themselves, and communicating with their neighbours To hold heavy books is tiring for the arms, and they begin to demand more and more pillows under the head The neck flexion which results may make an even longer period of immobilisation necessary

An apparatus developed at Harefield Hospital, and illustrated in the accompanying figures, consists of a permanent adjustable steel book support, writing table, and toilet shelf with a large mirror Except for the mechanism fixing it to the bed head, the whole apparatus can be adjusted and manipulated with ease by the patient, who quickly finds it indispensable The mirror and the combined support are mounted, independently of each other, on the adjustable horizontal bar, which can be rotated on the vertical bed attachment Tensioned ball and socket joints allow a wide range of movement of both the mirror and the support, which is adjustable to all sizes of books a copy of *Gray's Anatomy* can be read as easily as a Penguin Easily mastered finger screw locking and sliding extensions enable the patient to change from one book to another The shelf for toilet accessories can also support a book, or can be folded back when the support is closed down for writing A touch of the finger swings the apparatus to the side of the bed, out of the way, when the patient is receiving nursing attention

All patients being treated for spinal tuberculosis at Harefield are now using this combined reading, writing, and toilet aid, and consider it satisfactory It is obtainable at 10 guineas from the inventor, C D Inventions, 9, Bridge Street, Westminster, London, S W I





GENERAL MEDICAL COUNCIL

OPENING the 178th session of the council last Tuesday, Prof DAVID CAMPBELL, the president, spoke with deep regret of the death of two former members of the council, Dr Edwin Matthew and Lord Hacking, and of two active members, Prof W T Dilling and Sir William Thomson By retirement the council had lost Prof J W Bigger Prof Matthew Stewart and Lord Moran As new representatives he welcomed Dr Russell Brain (Royal College of Physicians), Prof I W McLeod F R S (University of Leeds) Mr J T Morrison, F R C S (University of Liverpool), Prof D S Torrens (University of Dublin), and Prof Hilda Lloyd (Royal College of Obstetricians and Gynæcologists) Though the late Dr Christine Murrell had been elected as a direct representative in 1933 Professor Lloyd was the first woman to undertake the full duties of membership of the council "It is a happy coincidence that at a time when in the field of medical education the responsibility of the council is extended beyond the undergraduate into the postgraduate or post-qualification stage, the presidents of the three Royal Colleges in England are numbered among their members

On July 28 continued the President, the Medical Act, 1950, received the Royal Assent In the achievement of this Act his predecessor, Sir Herbert Eason, had played the paramount part, as was recorded by the late Lord Hacking in the House of Lords when he said of Eason

"For many years he inspired his colleagues with his enthusiasm for the general welfare and integrity of the profession in which he was such an outstanding figure He laid well and truly the foundation stone of this Bill, and was the chief builder of the edifice It is sad that he could not see the completion of his work. I would pay my humble tribute to the memory of this remarkable man under whom I sat for a period of about ten years

In his presidential address last May, Professor Campbell had outlined the main provisions of the Bill as it was passed by the House of Lords, and he now completed the story by mentioning the principal amendments made by the House of Commons, 'where the Minister of Health was in charge of the Bill and laid us under a great obligation to him by one of his most masterly, if not one of his most masterful, displays of Parliamentary accomplishment '

The order of the Privy Council approving regulations of the council by which the period of employment in a resident medical capacity in one or more approved hospitals or institutions is to be prescribed, was made subject to approval of the draft of the order by resolution of each House of Parliament, colloquially known as an affirmative resolution.

I have reason to believe that some apprehension may still exist that the draft of the order may be laid before Parliament prematurely Any such apprehension should have been removed by the explicit assurance of the Minister that this is not going to be sprung upon the student immediately It is going to take between a year and two years to make these arrangements and members of the Education and Examination Committees and the council as a whole who are being invited to initiate consideration of the arrangements at this session will be under no illusion about their complexity or the time it will take to complete them

In the disciplinary provisions of the Bill the scope of the rules to be made by the Medical Disciplinary Committee was extended in order to secure that matters should not be referred to the committee until they had been investigated by a specially constituted committee of the council, which would in effect be the Penal Cases Committee It would be secured that any member of the council who acted in a case as a member of the Penal Cases Committee would be debarred from acting in the same case as a member of the Medical Disciplinary Committee—an exception being made for the president

The acceptance of this amendment by the Minister on the simple ground that The idea is that those who have already taken part in screening have a tendency to pre judge was the last word in a lengthy and ardent discussion of the proposal extending back to the preliminary stages of the preparation of a Bill It would ill become the person who for the time being holds the office of president to discuss the certificate of immunity from bias which Parliament has thus granted to him and it would not be fruitful to seek for the rationale of the protection against bias in reality or even in appearance, against which it has been thought right to protect other members of the council who might have served in the dual capacity Our business is to accept cheerfully the decision of the Legislature and to make it work. I doubt not that we shall be able to man both committees as separate organisations '

The King s Speech on Oct 26 referred to recent progress in the consolidation of statute law, and the President was reminded of Sir Herbert Eason's proposal five years ago that suggestions should be prepared for the consideration of the Government should they find themselves disposed to consolidate and amend what must be so treated if a single and intelligible Medical Act is to be made available for the public good Professor Campbell hoped that this far-sighted aspiration would also be realised at no distant date

It had been intended that the council should be invited to appoint the Medical Disciplinary Committee and a Legal Assessor or Assessors to the committee This would have enabled the committee at this session to settle a draft of rules as to their procedure and to enter into consultation on the draft 'The ultimate object was and is to enable the appointed day for the transfer of the disciplinary work of the council to the committee to be fixed in such time that all new cases will be heard by the committee in May, 1951" Unfortunately, however, the committee could not be appointed at this session, because the Act required that it should include at least two lay members of the council and the two such members additional to Lord Nathan who were to be nominated by His Majesty with the advice of the Privy Council had not yet been nominated In these circumstances it would be the duty of the council to meet again in February 1951

AU CONGRÈS MONDIAL

(FROM A CARDIOLOGICAL CORRESPONDENT)

THE affair began in the plane its occupants travelled in various moods The American pair settled in the front seats, with the *New York Times* and a fashion paper, and paid little attention to the scenery or the information that the plane was now passing Dieppe After all, they were used to long hops across the United States and had just crossed the Atlantic in eighteen hours The Canadian had done all this voyaging and more he told us, and was inclined to be critical of the small size and low speed of the plane Apart from a sprinkling of doctors and their wives—some airborne for the first time—only three other passengers are noteworthy the child flying to France to join her parents for the holidays, the green man, and the lady doctor who being persuaded to travel by air, had taken the precaution of making a trial flight with Aer Lingus —for Aer Lingus has not had a flying accident Each of us had an individual attitude towards the plane with its occasional bumps in the westerly gale, each had individual objectives The only true international was the green man in pursuit of business in America Europe, and Asia, who had been airsick in every civilised or semi-civilised country of the world By the time Le Bourget was sighted, the green had become that of incipient jaundice

* * *

Paris beneath its infinite variety is really the same efficient with baggage exact with bargaining exacting with rights, courteous with duties intolerant of strangers and their ignorance of local customs The three lines of traffic charging up the boulevard take no heed of the three lines charging down in the opposite direction, or of the intrepid one in the seventh line who tries to thread his way through relying on a maximal acceleration instantaneous braking, and masterly judgment—the supreme individualist Passing lights appears to be a minor matter with the gendarmes, for the drivers themselves know the danger the drivers take care of themselves

Paris and French! Paris so suitable for comfort, for food, for sight-seeing The Seine and its bridges, the wide-

streets, the great buildings set out in carefully tended gardens, Notre Dame, the Louvre, the spectacles at the Palais de Chaillot, the excursions to Versailles, to Chantilly, to Fontainebleau, the Sorbonne, so accessible, its theatres so numerous that two international congresses can be held simultaneously and without interference with each other

Paris and French! Why choose French, which is now no longer the language of polish and diplomacy, which is almost unknown to the Anglo Saxon world and is mispronounced so badly by the Italian, Spanish, and South American peoples? How can the nations communicate with each other lacking an international language?

* * *

Our French hosts had prepared the site admirably, had inaugurated the congress with supreme success in the presence of two most important members of the government, had put in presidential and vice presidential chairs men of years and of most honoured names, and then, like the gendarmes on the boulevard, had left the individual to manage for himself his affair

The decoration of the ceilings of the theatres where the sectional meetings were held was of museum status, but the narrow, hard seats with straight backs, the inadequate acoustics, the negligible ventilation, the movement of uncomfortable auditors, the close proximity of the noisy chatter of the assembly court, and the fickle lights There appeared to be five lanterns, two epidiascopes, and one cinema projector, with two operators between the five sectional theatres The lanterns appeared to have only one set of slide holders of each dimension, and much time was lost in getting the operator and his slide holders It appeared too that there was no standard size for lantern slides laid down, or regular means of labelling Thus many slides would not fit the holder, or were placed sideways or upside down, or contained so much data as to be unintelligible and inexplicable Too often the performance was unrehearsed and the result comic

The quality of the communications varied between the highest standard and fatuity, unfortunately, among a heterogeneous mass of unknowns there can be no seeding and no elimination National characteristics became evident in delivery The Frenchman had prepared a complete, rounded, and logical exposition which he delivered at a rapid pace and often in an undertone, intent on getting through his masterpiece in the time allotted Italians and Spaniards read at speed French translations of their views, nose to paper, with atrocious accent The Mexicans were good, they came as a team, each had at least one language other than his own, they sat together and were ready then to take up points in the discussion raised in any of the four official languages

Surely there might be an arrangement that eight of the ten minutes should be used to give an outline of the main points of the communication followed by two minutes of summary in French and in English This summary might be handed to an official interpreter to deliver, then it would not be made unintelligible by indifferent accent There is much to be said for our insistence that communications must be spoken and not read

At times an interpreter was provided, but he was often non medical and thus unable to give clarity to the points raised On one important occasion there was no one who could reconcile the issues between an Englishman, a Frenchman, and an Italian The best mutual interpretation was voluntary, and one whole session was much enhanced in importance and value by an Italian professor who summarised each speaker's words in French and in English

* * *

The value of an international congress lies in bringing workers in the same field of medicine together from all parts of the world, in attempting to standardise methods so that workers throughout the world may use the same notation and mean the same thing, and in seeing and hearing men from other countries submitting their views and opinions

Meanwhile some memories will remain the profoundly significant opening address of the aged president, Professor Laubry, with its insistence that in spite of all the help obtained by instrumental methods these must be subsidiary to examination and care of the patient himself and the clinical aspect, the witty and far-sighted allocution of M le Ministre de la Santé Publique at the banquet, the cordial reception and attentive hearing given to Dr Helen Taussig for her communications on the treatment of congenital heart-disease, the admirable collection of portraits of authors and copies of the works of those who had established cardiology, beginning with William Harvey and ending with Thomas Lewis the masterly appeal of Paul D White for world wide research on the cause and management of heart-disease, even the small terminal vignette by the Stockholm professor, Biorck, on the social consequences of cardiovascular disease in Sweden, a sound early contribution, all in the unique setting of Paris, Lutetia the lovable, in her infinite variety

A NEW SCIENCE CENTRE

THE Lord President of the Council has announced that we may look forward to having a national science centre in London on a site to be chosen early next year It will be some years before the Minister of Works can build such a centre, but a start will be made as soon as resources can be found Within the new centre accommodation will be built for the Royal Society and for other leading scientific societies with their special libraries, most of which are now severely cramped in the rooms provided for them by the Government about 100 years ago in Burlington House or in other inadequate accommodation The centre will also include the Patent Office and its library (which will be modernised and extended as a reference library on science and technology), the Department of Scientific and Industrial Research, and other Government scientific organisations

Medicine and the Law

Varicose Veins and Military Service

IN deciding how far disabilities are attributable to (or, alternatively, have been aggravated by) war service the series of war pension appeals is assembling medico legal material of varied interest The case of Wallbridge *v* Minister of Pensions, heard on Oct. 12 by Mr Justice Ormerod, the "nominated judge" for this purpose in succession to Mr Justice (now Lord Justice) Denning, concerned the disability of varicose veins The appeal tribunal had decided that the condition was not attributable to, although it was in fact aggravated by, war service The learned judge dismissed an appeal from this decision

The appellant enlisted in the R A F in April, 1939, at the age of 50, and at his medical examination was passed as grade I with no record of any varicose condition When his service began in the following September, he was employed in plotting the position of aircraft In the following March varicose veins were diagnosed with a previous history of varicose conditions in the left leg recurring at intervals On his discharge in 1945 he applied for a pension, but the tribunal held that the condition existed before his service began He was awarded a pension on the basis that the condition was aggravated by, but not attributable to, war service

War pension cases arise on facts which are often too special to make judicial precedents In the Wallbridge case reference was made to the previous case of Wills *v* Minister of Pensions, decided a year ago

Mr Wills suffered from varicose veins shortly after joining the service As there was a question of predisposition or congenital causes, the case was remitted to a tribunal and the opinion of an independent medical expert (Sir Ernest Rock Carling) was obtained The latter reported that the plea that wearing heavy boots caused the condition was untenable Marching, he said was not a cause, prolonged standing was undesirable where

there was a varicose tendency, but it was not in itself an efficient cause If either were in fact a cause of varicose veins, "the ranks of the Army would be riddled with cases" He considered that the varicosity was not attributable to war service, there was inherent weakness of the vein before war service, the varicosity arose during war service but was not aggravated thereby

The Medical Services Division of the Ministry gave a further opinion, quoting several recognised medical authorities The consensus of medical authority, stated the opinion, is that varicose veins are related to a congenital and inherited weakness of the walls of the veins and deficiency of their valves Marching in heavy boots or the wearing of anklets would not produce varicose veins The Ministry maintained the view that there was "a real preponderance of probability to the exclusion of reasonable doubt" that Mr Wills's disability arose independently of his service and was not aggravated thereby The appellant's solicitors submitted further medical reports and the independent medical expert expressed a further opinion thereon He noted the impression that some shop girls develop varicose veins, but there was no statistical evidence that the number was greater among those standing at the counter than among those in the counting house or among men who stand all day at machines Return of blood through the veins was largely effected by the contraction of the muscles surrounding them, walking or marching, as such, was an advantage rather than a detriment The superficial veins are not supported by muscles, functional inefficiency between the deep and superficial veins, caused by inherited defect, allows an incommoding varicosity to develop as a man gets older and the vessel walls become less elastic The course and the failure of operative treatment in Mr Wills's case made it clear that he suffered from such a valvular deficiency

The tribunal held that war service did not cause Mr Wills's varicose veins, the injurious process had begun years before, there was a family history, the condition was congenital The Ministry having discharged the burden of proof on the issue of attributability to war service, the appeal on this point was disallowed On the issue of aggravation by war service the tribunal could not at first make up its mind, later it gave Mr Wills the benefit of the doubt, being unable to say that military service played no part in causing the deterioration.

On the Wallbridge appeal the judge interpreted the Wills case as establishing that if a man suffered from varicose veins, or if they became manifest during war service, it was difficult for a tribunal to hold them attributable to war service unless there was some evidence of a supervening cause other than the ordinary conditions of war service In the absence of such supervening cause ordinary service conditions could not be regarded as causing varicose veins although they might aggravate the disability

The ailments considered in connection with claims for war pension range from Hodgkin's disease, Parkinson's disease and diabetes mellitus to muscular strain, anxiety state, and conjunctivitis Much medical information can be studied in the official or semi official Reports of Selected War Pension Appeals, from which the above account of the Wills case is largely derived

Death from Amethocaine

At an inquest in Manchester on Nov 22, a patient was reported to have died from hypersensitivity to amethocaine which had been applied to the throat before iodised oil was introduced into the bronchi.

According to medical evidence, the patient, a 31 year old man, was believed to have bronchiectasis, and the procedure was undertaken for the purpose of radiological examination 6 ml. of amethocaine solution had been sprayed on the throat, and a further 2 ml placed on a swab, this was probably less than the amount usually employed at the Royal Infirmary where the examination was made Administration of the amethocaine was completed in a quarter of an hour Soon after, without any warning, the patient had two major convulsions, and at the end of the second he died, it was all over in a matter of thirty to forty seconds Necropsy led to the conclusion that death was due to hypersensitivity to amethocaine Bronchiectasis was present

The coroner, returning a verdict of death by misadventure, said there could be no possible criticism of the hospital staff

Disabilities

54 BLINDNESS FROM RETINAL DETACHMENT

BLINDNESS came to me in two stages In the summer of 1945, without warning, I lost the sight of one eye An operation was performed and I lay motionless for ten weeks, but it did no good On returning to my ordinary business and domestic life I found that my principal handicap was a certain nervousness in traffic This I overcame in the early days by resisting an inclination to join the District Railway at St James's Park and instead forcing myself to go to Victoria, which involved crossing a busy thoroughfare I used the homeward bound crowds as unsuspecting guides through traffic The only other indication of the blindness, which was of the right eye, was constant bruising on that side due to bumping into various objects Now I realise how fortunate I was to have my full sight for fifty years and half sight for four

In the autumn of 1949 the retina of the left eye became detached This detachment came as suddenly as the first, and despite three operations and five months in hospital, I am now quite blind except for a precious bit of light in one corner of the left eye when the sun is very bright This eye is never "static", always there are varying lights, cloud effects, and flying saucers—in fact almost a private cinema—and this has become part of my life

Looking back, it seems almost incredible that anyone like myself who has led an active life could lie motionless day and night with eyes bandaged for almost five months in a state of comparative content I had to learn to distinguish many different voices, and soon found that people are touchy about being mistaken for someone else This did not worry me unduly, but I imagine that it might upset some patients, and for this reason I think that eye wards should be small—say, six to eight beds—thus reducing the number of people with whom the patient comes into contact On the other hand, to have been in a room by myself and denied the sounds of ward life would have been intolerable (Experience convinced me, by the way, that, in an ideal eye ward, bathrooms and lavatories should be very simply equipped, without obstructions of any kind)

I wonder if doctors and others realise the comfort and confidence it gives when they grip the fingers of a blinded patient by way of leave taking I received the greatest kindness, but sometimes nurses seemed not to have been told about the special difficulties of newly blind patients For instance, whereas the surgeon or houseman told me what he was going to do, such as uncovering the eyes or putting in drops a nurse seldom described the food she was giving or declared when she was leaving the bedside, thus saving me from talking to thin air This may seem trivial, but it makes a great difference During these five months although always hoping, I had faced the prospect of blindness, so when I knew I was blind it did not come as such a shock I was saved what I am told are the common immediate reactions to blindness —first resentment and then despondency

My great wish was to get home to my flat where I knew every step Being unable to continue my secretarial

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Medicine and the Law

Varicose Veins and Military Service

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The appellant enlisted in the R A F in April, 1939, at the age of 50, and at his medical examination was passed as grade I with no record of any varicose condition When his service began in the following September, he was employed in plotting the position of aircraft In the following March varicose veins were diagnosed with a previous history of varicose conditions in the left leg recurring at intervals On his discharge in 1945 he applied for a pension, but the tribunal held that the condition existed before his service began He was awarded a pension on the basis that the condition was aggravated by, but not attributable to, war service

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there was a varicose tendency, but it was not in itself an efficient cause If either were in fact a cause of varicose veins, "the ranks of the Army would be riddled with cases" He considered that the varicosity was not attributable to war service, there was inherent weakness of the vein before war service, the varicosity arose during war service but was not aggravated thereby

The Medical Services Division of the Ministry gave a further opinion, quoting several recognised medical authorities The consensus of medical authority, stated the opinion, is that varicose veins are related to a congenital and inherited weakness of the walls of the veins and deficiency of their valves Marching in heavy boots or the wearing of anklets would not produce varicose veins The Ministry maintained the view that there was "a real preponderance of probability to the exclusion of reasonable doubt" that Mr Wills's disability arose independently of his service and was not aggravated thereby The appellant's solicitors submitted further medical reports and the independent medical expert expressed a further opinion thereon He noted the impression that some shop girls develop varicose veins, but there was no statistical evidence that the number was greater among those standing at the counter than among those in the counting house or among men who stand all day at machines Return of blood through the veins was largely effected by the contraction of the muscles surrounding them, walking or marching, as such, was an advantage rather than a detriment The superficial veins are not supported by muscles, functional inefficiency between the deep and superficial veins, caused by inherited defect, allows an incommoding varicosity to develop as a man gets older and the vessel walls become less elastic The course and the failure of operative treatment in Mr Wills's case made it clear that he suffered from such a valvular deficiency

The tribunal held that war service did not cause Mr Wills's varicose veins, the injurious process had begun years before, there was a family history, the condition was congenital The Ministry having discharged the burden of proof on the issue of attributability to war service, the appeal on this point was disallowed On the issue of aggravation by war service the tribunal could not at first make up its mind, later it gave Mr Wills the benefit of the doubt, being unable to say that military service played no part in causing the deterioration

On the Wallbridge appeal the judge interpreted the Wills case as establishing that if a man suffered from varicose veins, or if they became manifest during war service, it was difficult for a tribunal to hold them attributable to war service unless there was some evidence of a supervening cause other than the ordinary conditions of war service In the absence of such supervening cause ordinary service conditions could not be regarded as causing varicose veins although they might aggravate the disability

The ailments considered in connection with claims for war pension range from Hodgkin's disease, Parkinson's disease, and diabetes mellitus to muscular strain, anxiety state, and conjunctivitis Much medical information can be studied in the official or semi official Reports of Selected War Pension Appeals, from which the above account of the Wills case is largely derived

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According to medical evidence the patient, a 31 year-old man was believed to have bronchiectasis, and the procedure was undertaken for the purpose of radiological examination 6 ml of amethocaine solution had been sprayed on the throat, and a further 2 ml placed on a swab, this was probably less than the amount usually employed at the Royal Infirmary where the examination was made Administration of the amethocaine was completed in a quarter of an hour Soon after, without any warning, the patient had two major convulsions, and at the end of the second he died, it was all over in a matter of thirty to forty seconds Necropsy led to the conclusion that death was due to hypersensitivity to amethocaine Bronchiectasis was present

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BLINDNESS came to me in two stages In the summer of 1945, without warning, I lost the sight of one eye An operation was performed and I lay motionless for ten weeks, but it did no good On returning to my ordinary business and domestic life I found that my principal handicap was a certain nervousness in traffic This I overcame in the early days by resisting an inclination to join the District Railway at St James's Park and instead forcing myself to go to Victoria, which involved crossing a busy thoroughfare I used the homeward-bound crowds as unsuspecting guides through traffic The only other indication of the blindness, which was of the right eye, was constant bruising on that side due to bumping into various objects Now I realise how fortunate I was to have my full sight for fifty years and half sight for four

In the autumn of 1949 the retina of the left eye became detached This detachment came as suddenly as the first, and despite three operations and five months in hospital, I am now quite blind except for a precious bit of light in one corner of the left eye when the sun is very bright This eye is never "static", always there are varying lights, cloud effects, and flying saucers—in fact almost a private cinema—and this has become part of my life

Looking back, it seems almost incredible that anyone like myself who has led an active life could lie motionless day and night with eyes bandaged for almost five months in a state of comparative content I had to learn to distinguish many different voices, and soon found that people are touchy about being mistaken for someone else This did not worry me unduly, but I imagine that it might upset some patients, and for this reason I think that eye wards should be small—say, six to eight beds—thus reducing the number of people with whom the patient comes into contact On the other hand, to have been in a room by myself and denied the sounds of ward life would have been intolerable (Experience convinced me, by the way, that, in an ideal eye ward, bathrooms and lavatories should be very simply equipped, without obstructions of any kind)

I wonder if doctors and others realise the comfort and confidence it gives when they grip the fingers of a blinded patient by way of leave taking I received the greatest kindness, but sometimes nurses seemed not to have been told about the special difficulties of newly blind patients For instance, whereas the surgeon or houseman told me what he was going to do, such as uncovering the eyes or putting in drops, a nurse seldom described the food she was giving or declared when she was leaving the bedside, thus saving me from talking to thin air This may seem trivial, but it makes a great difference During these five months, although always hoping, I had faced the prospect of blindness, so when I knew I was blind it did not come as such a shock I was saved what I am told are the common immediate reactions to blindness —first resentment and then despondency

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streets, the great buildings set out in carefully tended gardens, Notre Dame, the Louvre the spectacles at the Palais de Chaillot, the excursions to Versailles, to Chantilly, to Fontainebleau, the Sorbonne, so accessible, its theatres so numerous that two international congresses can be held simultaneously and without interference with each other

Paris and French! Why choose French, which is now no longer the language of polish and diplomacy, which is almost unknown to the Anglo Saxon world and is mispronounced so badly by the Italian, Spanish, and South American peoples? How can the nations communicate with each other lacking an international language?

* * *

Our French hosts had prepared the site admirably, had inaugurated the congress with supreme success in the presence of two most important members of the government, had put in presidential and vice presidential chairs men of years and of most honoured names, and then, like the gendarmes on the boulevard, had left the individual to manage for himself his affair

The decoration of the ceilings of the theatres where the sectional meetings were held was of museum status, but the narrow, hard seats with straight backs, the inadequate acoustics, the negligible ventilation, the movement of uncomfortable auditors, the close proximity of the noisy chatter of the assembly court, and the fickle lights There appeared to be five lanterns, two epidiascopes, and one cinema projector, with two operators between the five sectional theatres The lanterns appeared to have only one set of slide holders of each dimension, and much time was lost in getting the operator and his slide-holders It appeared too that there was no standard size for lantern-slides laid down, or regular means of labelling Thus many slides would not fit the holder, or were placed sideways or upside down or contained so much data as to be unintelligible and inexplicable Too often the performance was unrehearsed and the result comic

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I wonder if doctors and others realise the comfort and confidence it gives when they grip the fingers of a blinded patient by way of leave taking I received the greatest kindness, but sometimes nurses seemed not to have been told about the special difficulties of newly blind patients For instance, whereas the surgeon or houseman told me what he was going to do, such as uncovering the eyes or putting in drops a nurse seldom described the food she was giving or declared when she was leaving the bedside, thus saving me from talking to thin air This may seem trivial, but it makes a great difference During these five months, although always hoping, I had faced the prospect of blindness, so when I knew I was blind it did not come as such a shock I was saved what I am told are the common immediate reactions to blindness —first resentment and then despondency

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work and having no private income, I had to consider my finances However, by letting part of the flat to two business girls and with the pension granted I am able to manage I am glad that my flat faces on to a noisy, traffic laden thoroughfare in west London—noisy, that is, except between the hours of 10 30 P M and 6 30 A M Sounds which I previously heard subconsciously have now become a major part of my life and help me to keep in contact with time In the quiet of the night one can sometimes hear a boat's siren on the river, and that, like the works' whistles at 8 A M, is a joy to a Clyde born Scotswoman At about 4 30 A M in spring and summer the birds begin to sing, and then it is strange to think one is in the heart of London and that their song will soon be lost in the roar of traffic At 5 30 the newspapers are delivered to a shop opposite, and by 6 the day's work at that shop has begun

I have been back at home for ten weeks and can do quite a lot of housework, including baking, washing, ironing, and sewing Some jobs—for instance, dusting high shelves—have to be done when I am alone, as friends and relations get a bit nervous when they see me attempting what to them seems dangerous I have been asked how I know when things are cooked I don't know how I know, but I do So far my only failure has been when I attempted to make Scotch pancakes Although I succeeded in getting the mixture on to the girdle, I could not find the pancakes to turn them over, but these pancakes will be conquered yet I have been twice to the theatre, thoroughly enjoying the plays, and strangely enough I was able to depict fairly accurately the stage settings Wireless concerts are another joy All else apart, there is the feeling of being part of the community I have the same feeling in a restaurant At first I was reticent about eating in public, but now I do not mind so long as there is someone to cut up the meat To me it seems essential to make all these efforts—and they are efforts—in the early stages of blindness as otherwise one is apt to become self conscious

My great difficulty is in learning Braille I know all the letters but am slow, and this is the only thing connected with the blindness which irritates me (I do not even get cross when I lose things This to me is a great wonderment, for I have always had a wee bit of impatience with any slowness, and I certainly have to go slow nowadays) However, my Braille teacher assures me that I am making normal progress and that one suddenly finds Braille easy I am, of course, spoiled by having received from friends a talking book machine To salve my conscience I am learning to make rugs, and while listening I can also knit and sew

The blind may sometimes seem unappreciative of kindnesses offered and shrink from accepting invitations Most often this is due to the fear of being a nuisance, especially when one has to be "fetched and returned" Even in the early days I could cope fairly effectively with letter writing by using raised lined paper (which can be purchased from the National Institute for the Blind) for ordinary correspondence, for airmail letters I used this lined paper as a guide, attaching the thin airmail sheets to it by ordinary spring clothes pegs, bulldog or paper clips being less easily manipulated Now I am usually able to write clear and straight without any guiding lines In many ways I feel like a child learning something new every day and being bucked with my achievements A clock that chimes the quarters and a Braille watch are great helps, but I still wear my small, now useless, wrist watch, which I call my "optimism" Each blinded person finds little things which help For instance, to indicate the top side of my eiderdown I have put a small safety pin in one corner One should use a glove to replace a saucepan on the hot-plate of the electric cooker I usually forget and use my bare fingers—which isn't too good for the Braille !

Since I was very young I have always given thanks for the beauties of the world, my home, my family and friends, the work I was able to do, my health and strength, my wholeness of body and mind and my memories It seems as if that was a sort of premonition, for now that I have lost the wholeness of body, the other "gratitudes" are my greatest comforts I have been fortunate in having seen quite a bit of my own country and also a few other parts of the world, and these memories of the loveliness of sea and land are now a special joy (I am glad of the plain, straightforward way we were taught geography when I was young, because I have a very vivid picture of the map of the world) In my family and friends I am blessed Since I lost my sight I have received the utmost kindness from all manner of folk met casually, including especially telephone operators and bus conductors By conductors a blind person is treated as special cargo, and twice lately in a peremptory voice a conductor has called "Which gentleman is giving up his seat," without waiting for the offer which always comes

That one has an added sense—is it only one ?—is undoubtedly true Even in the few weeks of my blindness I have had the most remarkable experiences, finding with ease something I expected would be difficult to find, changing to a pencil when the pen had run dry—though I had no way of actually knowing it was dry In fact, so often do strange things happen like this that friends say they think I must see a little How I wish I could! One of the things partly lost with blindness is privacy, one's life is more exposed Many people have weaknesses In my case it is an old maidish habit of turning back when leaving the flat to make sure that the electric power to the cooker is off and this weakness is now sometimes laughed at by my escort However, the greatest loss of privacy is in the reading of correspondence, one is apt to feel that a third person may find the chat of one's friends a bit stupid I have (or had) another weakness for reading my letters many times, and I still find it difficult to memorise, from a single reading, all that a letter contains To ask a person to read a letter more than once is embarrassing—especially if the reader is one of these splendid practical people who read a letter just once and do not hoard correspondence The remedy for hiding this is to get letters re read by different folk Any fear that some people might miss out worrying or controversial parts can be overcome by the choice of readers

This brings up a very interesting phase of blindness—the reactions of relatives and friends These are, to me a source of constant interest Though everyone is extraordinarily kind the blind one often needs to exercise quite a lot of tolerance as people in their kindness and helpfulness might sometimes irritate but for one's gratitude I suppose we blind are in many ways more sensitive than when we had our sight For instance, things people say, often casually, may make a deep impression, and encouragement means a great deal because even when the blinded one is making good progress in rehabilitation and putting a good face on it, his whole life is so changed that a little praise for achievements is helpful Once I discussed with a young doctor how I would manage if I should become blind, and he assured me that I would never be helpless or a burden, also I was told that I had the courage to face whatever came Whether or not I merited these opinions, often during the five months I lay in hospital these as well as other encouragements gave me great comfort At that time I determined that, if I were to be blind, I would try to be one of the "happy blind"

In blindness I have found a deep loneliness, but not a depressing loneliness, because there is a oneness with something outside myself which brings content and acceptance

In England Now

A Running Commentary by Peripatetic Correspondents

THE last time I had been in the Horticultural Hall was for the Model Engineering Exhibition, a show patronised by old boys and young boys, whereas at the Medical Exhibition there wasn't a boy to be seen Yet there were a lot of things that would have interested a schoolboy, for even medicine is becoming mechanised, at least in some branches The show is essentially a trade affair, but it seems a pity that space is not taken by the M R C and other official bodies, after the fashion of Government departments at other technical exhibitions By this means the balance of the whole would be improved, and general practitioners in particular would see for themselves how far officially sponsored research might influence their everyday work, either in therapeutics or public health The introduction of official stands might also, by their example in dignified but arresting layout, exert a restraining influence on the means used by some firms to attract attention in a few cases these were reminiscent of the Great West Road Activity at the stands seemed in fact to be determined almost entirely by the technical excellence of the products on view, no doubt the medical household names always command attention, but their fortunate possessors take jolly good care that their products reach a high standard I was glad to see that the excellent American method of advertising products with coloured photographs of relevant pathological and other specimens has spread to this country The programme of medical films covered many aspects of experimental medicine, and it was a pity that the times of showing were not put on the official invitation, because I, for one, went on the wrong day for a film I should like to have seen

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Not long ago, reading a serious scholarly book about the fifteenth century Florentines, I got what was for me new light on influenza It seems that the malady visited Florence in fourteen something, and the citizens, like others since their time, found it puzzling They asked their doctors what it was but the doctors didn't know So they asked the astrologers *They* knew It was Influence, the influence of the stars influenza' The astrologers probably told them which stars Poor blighters Groping in the fog of ignorance and superstition, unillumined by the beams of modern science "How rich and great the times are now! We know that there are really *two* influences—A and B

* * *

Flying saucers[1] have now appeared in my part of England, so they say, and I doubt whether the indigenes who report them are imaginative enough to invent them Besides, the accounts of round lighted objects flying very fast come from spots miles apart and seem to tally I wish I had seen them myself, but 11 P.M is not my usual time for fresh air and exercise The news has been discussed locally with incredulous uneasiness The vicar, for instance, smiled uncomfortably and made a witty remark about them two able and intelligent men—a headmaster staying here for half term, and an ex-R.A.F officer—remarked independently that they sounded sinister and perhaps they were Russian, women quoted rumours of 'little men" 3 feet high in a saucer that crashed in America, and one man who had seen them thought they were rockets But most people passed them off as a vaguely unpleasant joke

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work and having no private income, I had to consider my finances However, by letting part of the flat to two business girls and with the pension granted I am able to manage I am glad that my flat faces on to a noisy, traffic laden thoroughfare in west London—noisy, that is, except between the hours of 10 30 P M and 6 30 A M Sounds which I previously heard subconsciously have now become a major part of my life and help me to keep in contact with time In the quiet of the night one can sometimes hear a boat's siren on the river, and that, like the works' whistles at 8 A M, is a joy to a Clyde born Scotswoman At about 4 30 A M in spring and summer the birds begin to sing, and then it is strange to think one is in the heart of London and that their song will soon be lost in the roar of traffic At 5 30 the newspapers are delivered to a shop opposite, and by 6 the day's work at that shop has begun

I have been back at home for ten weeks and can do quite a lot of housework, including baking, washing, ironing, and sewing Some jobs—for instance, dusting high shelves—have to be done when I am alone, as friends and relations get a bit nervous when they see me attempting what to them seems dangerous I have been asked how I know when things are cooked I don't know how I know, but I do So far my only failure has been when I attempted to make Scotch pancakes Although I succeeded in getting the mixture on to the girdle, I could not find the pancakes to turn them over, but these pancakes will be conquered yet I have been twice to the theatre, thoroughly enjoying the plays, and strangely enough I was able to depict fairly accurately the stage settings Wireless concerts are another joy All else apart, there is the feeling of being part of the community I have the same feeling in a restaurant At first I was reticent about eating in public, but now I do not mind so long as there is someone to cut up the meat To me it seems essential to make all these efforts—and they are efforts—in the early stages of blindness as otherwise one is apt to become self conscious

My great difficulty is in learning Braille I know all the letters but am slow, and this is the only thing connected with the blindness which irritates me (I do not even get cross when I lose things This to me is a great wonderment, for I have always had a wee bit of impatience with any slowness, and I certainly have to go slow nowadays) However, my Braille teacher assures me that I am making normal progress and that one suddenly finds Braille easy I am, of course, spoiled by having received from friends a talking book machine To salve my conscience I am learning to make rugs, and while listening I can also knit and sew

The blind may sometimes seem unappreciative of kindnesses offered and shrink from accepting invitations Most often this is due to the fear of being a nuisance, especially when one has to be "fetched and returned" Even in the early days I could cope fairly effectively with letter writing by using raised lined paper (which can be purchased from the National Institute for the Blind) for ordinary correspondence, for airmail letters I used this lined paper as a guide, attaching the thin airmail sheets to it by ordinary spring clothes pegs, bulldog or paper clips being less easily manipulated Now I am usually able to write clear and straight without any guiding lines In many ways I feel like a child learning something new every day and being bucked with my achievements A clock that chimes the quarters and a Braille watch are great helps, but I still wear my small, now useless, wrist watch, which I call my "optimism" Each blinded person finds little things which help For instance, to indicate the top side of my eiderdown I have put a small safety pin in one corner One should use a glove to replace a saucepan on the hot plate of the electric cooker I usually forget and use my bare fingers—which isn't too good for the Braille!

Since I was very young I have always given thanks for the beauties of the world, my home, my family and friends, the work I was able to do, my health and strength, my wholeness of body and mind, and my memories It seems as if that was a sort of premonition, for now that I have lost the wholeness of body, the other "gratitudes" are my greatest comforts I have been fortunate in having seen quite a bit of my own country and also a few other parts of the world, and these memories of the loveliness of sea and land are now a special joy (I am glad of the plain, straightforward way we were taught geography when I was young, because I have a very vivid picture of the map of the world) In my family and friends I am blessed Since I lost my sight I have received the utmost kindness from all manner of folk met casually, including especially telephone operators and bus conductors By conductors a blind person is treated as special cargo, and twice lately in a peremptory voice a conductor has called "Which gentleman is giving up his seat," without waiting for the offer which always comes

That one has an added sense—is it only one?—is undoubtedly true Even in the few weeks of my blindness I have had the most remarkable experiences, finding with ease something I expected would be difficult to find, changing to a pencil when the pen had run dry—though I had no way of actually knowing it was dry In fact, so often do strange things happen like this that friends say they think I must see a little How I wish I could! One of the things partly lost with blindness is privacy, one's life is more exposed Many people have weaknesses In my case it is an old maidish habit of turning back when leaving the flat to make sure that the electric power to the cooker is off and this weakness is now sometimes laughed at by my escort However, the greatest loss of privacy is in the reading of correspondence, one is apt to feel that a third person may find the chat of one's friends a bit stupid I have (or had) another weakness for reading my letters many times, and I still find it difficult to memorise, from a single reading, all that a letter contains To ask a person to read a letter more than once is embarrassing—especially if the reader is one of these splendid practical people who read a letter just once and do not hoard correspondence The remedy for hiding this is to get letters re read by different folk Any fear that some people might miss out worrying or controversial parts can be overcome by the choice of readers

This brings up a very interesting phase of blindness—the reactions of relatives and friends These are, to me, a source of constant interest Though everyone is extraordinarily kind the blind one often needs to exercise quite a lot of tolerance as people in their kindness and helpfulness might sometimes irritate but for one's gratitude I suppose we blind are in many ways more sensitive than when we had our sight For instance, things people say, often casually, may make a deep impression, and encouragement means a great deal because even when the blinded one is making good progress in rehabilitation and putting a good face on it, his whole life is so changed that a little praise for achievements is helpful Once I discussed with a young doctor how I would manage if I should become blind, and he assured me that I would never be helpless or a burden, also I was told that I had the courage to face whatever came Whether or not I merited these opinions, often during the five months I lay in hospital these as well as other encouragements gave me great comfort At that time I determined that, if I were to be blind, I would try to be one of the "happy blind"

In blindness I have found a deep loneliness, but not a depressing loneliness, because there is a oneness with something outside myself which brings content and acceptance

In England Now

A Running Commentary by Peripatetic Correspondents

THE last time I had been in the Horticultural Hall was for the Model Engineering Exhibition, a show patronised by old boys and young boys, whereas at the Medical Exhibition there wasn't a boy to be seen Yet there were a lot of things that would have interested a schoolboy, for even medicine is becoming mechanised, at least in some branches The show is essentially a trade affair, but it seems a pity that space is not taken by the M R C and other official bodies, after the fashion of Government departments at other technical exhibitions By this means the balance of the whole would be improved, and general practitioners in particular would see for themselves how far officially sponsored research might influence their everyday work, either in therapeutics or public health The introduction of official stands might also, by their example in dignified but arresting layout, exert a restraining influence on the means used by some firms to attract attention in a few cases these were reminiscent of the Great West Road Activity at the stands seemed in fact to be determined almost entirely by the technical excellence of the products on view no doubt the medical household names always command attention, but their fortunate possessors take jolly good care that their products reach a high standard I was glad to see that the excellent American method of advertising products with coloured photographs of relevant pathological and other specimens has spread to this country The programme of medical films covered many aspects of experimental medicine, and it was a pity that the times of showing were not put on the official invitation, because I, for one, went on the wrong day for a film I should like to have seen

* * *

Not long ago, reading a serious scholarly book about the fifteenth century Florentines, I got what was for me new light on influenza It seems that the malady visited Florence in fourteen something, and the citizens, like others since their time, found it puzzling They asked their doctors what it was but the doctors didn't know So they asked the astrologers *They* knew It was Influence, the influence of the stars, influenza" The astrologers probably told them which stars Poor blighters Groping in the fog of ignorance and superstition, unillumined by the beams of modern science 'How rich and great the times are now' We know that there are really *two* influences—A and B

* * *

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Some say that the saucers are meteorites, but would a meteorite follow a coastline? Or would it when falling headlong check itself and continue on a horizontal course, as one was seen to do here? It sounds much more like a pilot controlled machine Anyway, my household is now keeping a good look-out, so perhaps my next instalment will be an eye-witness description with diagrams, like the ones we had of the Loch Ness monster!

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Letters to the Editor

THE PRACTITIONER'S REMUNERATION

SIR,—I have read with great interest your annotation of Nov 18

All must agree that if extra money is to be obtained, the Treasury must be convinced that the claim is sound Would the Treasury be convinced if it was proved that part of the enormous cost of the health service is due to a system which forces a general practitioner to be a head hunter (capitation) in order to live? A visit to the casualty department of a large hospital or a talk to a consultant after he has finished a session is an eye opener in this respect Give a practitioner time to do the work for which he was trained, time to take proper histories and fully examine his patients, and a very different picture of hospital practice could soon be painted

How can this be done? Some have said that the introduction of a graduated capitation fee will solve the general practitioner's problem, that this is not so is indicated by the following table, which was prepared for me by experts

No of patients (total in parentheses)	Capitation fee	Total (£)	Remarks
1000 (1000)	30s	1500	Will require a basic salary or expenses allowance to meet liabilities
500 (1500)	25s	625	Just about cover expenses
500 (2000)	20s	500	Credit balance of about £300
500 (2500)	15s	375	Credit balance of about £500
500 (3000)	15s	375	Credit balance increased but income tax much heavier
500 (3500)	10s	250	Big lists need to be discouraged
500 (4000)	10s	250	

After many hours' work it was decided that it was impossible in equity to others to make solvent the men with 1000 patients, except with the addition of basic salary or expenses allowance, without at the same time raising the income of the man with the big list—a step which could never get Treasury approval

Is it not essential, therefore, that a system be introduced which enables all general practitioners within the service to start their day's work with an untroubled mind, knowing that they are certain month by month to be able to pay their way and meet all practice expenses, no longer haunted by the thought "Have I got enough 'heads' to live?" In order to have a free mind, to be once again a clinician and not a head hunter, there is no other way, taking the long term view, than by means "basically" of an expenses allowance

This allowance should certainly be enough to allow a practitioner, just starting in practice, to pay his way while collecting to himself patients The rest of the remuneration structure can then be built round this according to experience, ability, and responsibility accepted

The General Medical Services Committee base their claim for extra remuneration on the Spens report, but, as you have suggested,[1] surely it would be much safer if the claim was based on the practitioner's deserving to enjoy an income not unfavourable compared with that of his specialist colleagues (which is far from the case at present) and on the recommendation of the Cohen report that this remuneration should be "commensurate with those in other spheres of medical practice"[2]

Redistribution will certainly take place in time; but time is the essence of the present problem Statistics show that under the present method of remuneration 1000 doctors would have to be moved from South Eastern England Can anyone guarantee to re house all these doctors in other areas within three years? And all that time bankruptcy draws ever nearer

The Conference of Local Medical Committees certainly agreed that if any more money was forthcoming, it should be used to increase the capitation fee on the first 1000 patients, yet you admit that this would give an all round increase not confined to doctors with small lists Do you really think the Treasury would be prepared to provide extra money which would increase the already big incomes of the big list men? Or a court of arbitration?

Finally, at the outset of the new service the profession rejected the idea of any portion of remuneration being universally applicable (unrelated to numbers on list), surely because it was thought to be the first step to a salaried service How could an expenses allowance for rent, rates, taxes, light, heat, and telephone, be called the first steps to a salary, except in the mind of a Munchausen?

Worthing HAROLD LEESON

1 *Lancet*, 1949, i, 527

2 The Training of the General Practitioner London British Medical Association 1950

GROSS GASTRIC DELAY SHOWN RADIOLOGICALLY

SIR,—It has long been known that in severe cases of pyloric or duodenal stenosis the residue of a meal may remain in the stomach for days or even weeks So far as I can ascertain, however, the emptying time in such a case has never been investigated radiologically Thus the following case may prove of interest

A man, aged 35, was sent for a barium meal investigation with a history of four years' dyspepsia associated with vomiting every two weeks or so He was tall and rather emaciated Screening showed well marked pyloroduodenal stenosis The stomach was ptosed, atonic, and grossly dilated, and peristalsis was almost absent A fair amount of "resting juice" was present, and the meal pooled into the bottom of the body or pars media of the stomach giving the typical "semi saucer" appearance of obstruction An indolent ulcer crater was present on the lesser curvature (*a* in figure), but this was not tender on palpation The duodenal cap could not be filled owing to cicatrisation from previous healed ulceration. There was nothing in the appearances or history to suggest malignancy

The surgeon to whom the case was referred decided to operate, but the patient was told he would have to wait for a few weeks before a bed was available For this reason, and also out of interest, I decided to follow the case through while the patient was waiting

(a) Immediately after meal (b) After 6 days. (c) After 25 days

The stomach was still nearly full after 27 hours, but a little barium had reached the descending colon by that time Very little left the stomach in the next two days, and the stomach was still more than half full after six days (*b* in figure), by which time the head of the meal had reached the pelvic colon. After ten days the stomach was a third full and after fifteen days it was still about a quarter full On the twenty fifth day there was still an appreciable amount of the original barium meal left in the stomach (*c* in figure), and on the thirtieth day part of the stomach wall could still be seen outlined with flecks of barium

The amazing thing about this patient is that he had a good appetite all the time, ate three good meals every day, and worked fairly hard as a printer Every fortnight or so he vomited a large quantity of food, after which he felt more comfortable and went back to his three big meals a day!

London W 1 I. EBAN

ADAPTATION IN PHYSIOLOGICAL PROCESSES

SIR,—In discussing the valuable contributions of Professor Selye a distinction must, I think, be made between the facts he presents and the interpretations he offers I shall deal here with his experiments on exercise, one of the main categories of "stress" which he has studied [1]

The physiological responses to exercise, he finds, are complexly patterned—i e they appear as a multiform syndrome Exercising animals to a point of exhaustion led within 48 hours to involution of endocrine glands the great parenchymatous organs, different parts of the hæmopoietic system, and lymph nodes and lymphatic vessels With the same experimental method Selye produced ovarian atrophy and œstrous disturbances, regression of acinar tissue of the pancreas, a shift of fat from subcutaneous deposits into the liver and various biochemical reactions Among the other effects of exercise to which he refers are increased excretion of corticoids (previously observed only in race horses), recorded by Venning and Kazmin, temporary inhibition of urine secretion, a phenomenon originally discovered by Hellebrandt and changes in capillary permeability a subject studied for many years by Eppinger

All these reactions are non specific and can be elicited not only through exhaustive exercise but also through transection of the spinal cord, starvation, histamine, bacterial toxins, hormones certain pharmacological substances, anoxia, asphyxia, solar radiation, electrical injury, cold, X irradiation, burns, and trauma

Selye has proved that basically the animal organism reacts in a constant manner to a variety of "alarming stimuli" of which exercise is one He clearly differentiates between specific forms of reaction to stress—i e, reactions which depend upon the nature of the stimulus—and the uniform pattern of the "alarm reaction" and of the "syndrome of adaptation" Thus, it is not justifiable to say that Selye proposes a monistic concept of pathology In so far as he deals with the synonymity of certain aspects of the physiological reaction to stress, he follows the precedent set by Walter Cannon, whose theories have for many years formed a fruitful basis for experimental research in physiology of exercise [2]

A different attitude must, I submit be taken in respect of the criticism levelled against Selye's views as set out in his chapter on Clinical Applications of the General Adaptation Syndrome Concept A categorical distinction must be made between adaptations in physiological as against adaptations in pathological processes This concept, which was first formulated about 1890 by Cohnheim, of Breslau, was admirably presented by his pupil William Henry Welch. "One fails to see in pathological conditions," Welch wrote, "that coördinate and special fitness which we are accustomed to find in physiological adaptations" [3] Pathological reactions, he maintained, may or may not be of therapeutic significance, and they may even aggravate the disorder His thesis was that in pathological processes adaptation is of the kind used in physiological processes for the distinct purpose of bringing about an adjustment of a given function to changed environmental conditions "We have no reason to suppose," he once remarked, "that the animal body is endowed with properties designed to meet pathological emergencies Indeed, its sole weapons of defence, often lamentably imperfect for morbid states, are adapted primarily for physiological use" If they do meet certain pathological conditions, the explanation is simply coincidence

Conversely, there is no evidence that in normal subjects physical exercise can be conducive to any of the clinical conditions which, according to Selye, react in some way or other to A C T.H or 'Cortisone.' Elsewhere [4] I have dealt with a variety of pathological conditions encountered in athletes, with special reference to apparently healthy persons breaking down during effort Some of these conditions are specifically produced by exercise, among them being "indisposition after running" or "athlete's sickness' (a syndrome characterised by vomiting, profuse sweating, and headache, commonly observed after quarter-mile sprints), hypoglycemia after marathon races, muscle cramp in gymnasts, or fainting due to gravitatory displacement of blood after exertion But in a greater number of the pathological states I described, the exercise though often the last contributory cause, did not actually produce them Examples are coronary occlusion associated with effort, rupture of arteries, paroxysmal anomalies of intracardiac conduction, and hæmorrhagic pancreatitis after muscular exhaustion

All general autonomic adjustments elicited by muscular effort involve endocrine and nervous functions of the kind studied by Selye This is important since he believes that adaptation energy represents an unspecific pool of physiological driving force that may become exhausted if the organism is exposed to stress, irrespective of its nature

Exercise may aggravate pre existing illness for example, a girl hockey player with myasthenia gravis had to double her daily dose of neostigmine when she resumed training On the other hand, many diabetics and other chronically ill people do better and need less insulin when they are physically active [5] two of the greatest tennis players in the world today are afflicted with diabetes

Normal humoral or tissue immunity, however, is not increased through training Normal immunological reactions are by products of physiological cell metabolism—a concept first expounded by Paul Ehrlich [6]—and contrary to popular belief there is no evidence that a high standard of physical fitness (i e, a state of adaptation to one of Selye's "stresses") is associated with, or conducive to, heightened resistance towards infectious diseases Universal protection against infectious diseases is certainly not afforded by physical training Physical training does not even lead to a general increase of the scope of normal immunological mechanisms [7]

Selye s material illustrates the correctness of Cohnheim's original thesis by showing that many autonomic adaptations are basically the same whether they are elicited by exercise or—to choose one of Selye's standard experiments—by transection of the spinal cord His findings corroborate the conclusion that in pathological situations the body is unable to mobilise weapons other than physiological ones Only in physiological situations do these reactions serve a purpose They achieve nothing in the way of repairing a severed

1 Selye H Stress. Montreal 1950
2 Jokl E *Z Neurol. Psychiat* 1930 129 460
3 Welch W H Adaptation in Pathological Processes Baltimore 1937
4 Jokl E Syncope in Athletes Pretoria 1947
5 Jokl E *Brit J phys Med.* 1948 11 2
6 Ehrlich P Beiträge zur experimentellen Pathologie und Chemotherapie Leipzig 1909
7 Jokl, E *Z ges exp Med.* 1931 77 769

spinal cord, nor do they help the organism to resist an attack by the hæmolytic streptococcus The fact that in controlled experiments physiological substances, given in large quantities, may exert a therapeutic influence upon pathological conditions—the recent discovery of the apparent efficacy of A C T H and cortisone on malignant tumours is an impressive example [8]—fits into this concept

Professor Selye deserves the admiration and thanks of the medical profession for presenting so much new experimental evidence The most effective answer to his critics he has given himself by stating "Our facts must be correct Our theories need not be if they help us to discover important new facts"

Union Education Department
Pretoria ERNST JOKL

STREPTOMYCIN AND TUBERCULIN

SIR,—I have already reported in your columns certain observations on the effect of streptomycin on the tuberculin reaction in tuberculous meningitis [9] Further experience has shown that in this respect cases fall into three groups as follows

1 Moderate cases, in which the reaction increases at the commencement of streptomycin treatment and then falls away as recovery sets in When the stage of apparent cure is reached, the test again becomes strongly positive and remains so during convalescence
2 Severe cases, in which the reaction is negative or weakly positive in the early stages and becomes stronger as treatment proceeds Its subsequent behaviour depends on the course of the disease
3 Very severe cases with a positive reaction in which the outcome is fatal despite treatment In these cases, the reaction remains positive throughout

In the light of the above observations, I have now used subcutaneous or intravenous tuberculin in conjunction with streptomycin for some time, varying the dose according to the strength of the reaction

In three cases I have administered tuberculin intrathecally, but I have now abandoned this route because of the violent reactions which followed

CASE 1—Aged 10 years Admitted April 6, 1947 On Oct 2, 1947, tuberculin 0 01 μg was given intrathecally, in view of the persistence of a high level of protein in the cerebrospinal fluid The reaction was severe The temperature rose above 39°C, there was violent headache, and the C S F pressure increased Two days later 0 1 μg was given, and the same reaction was observed, but subsided within 24 hours The patient was discharged on Dec 16, 1947, and has remained well since

CASE 2—Aged 8 Admitted April 11, 1947 One dose of tuberculin 1 μg was given intrathecally on April 20, 1947, but was not repeated in view of the violence of the reaction Tuberculin was subsequently given subcutaneously The patient was discharged on Oct 5, 1947, and has remained well since

CASE 3—Aged 6 Admitted Dec 27, 1947 Owing to the prolonged course of the disease, one intrathecal injection of tuberculin 0 01 μg was given on April 16, 1948 This was followed by a very severe reaction the temperature rose to over 40°C, the pulse rate to 150, and the C S F pressure so high as to cause exophthalmos For two weeks symptoms had to be relieved by drawing off C S F After that time it was found that protein had increased from 1 6 to 4 g per 100 ml, and cells (mainly lymphocytes) from 30 to 750 per ml The patient recovered and was discharged on Sept 20 1948

Though we cannot yet draw any conclusions as to the usefulness of tuberculin in conjunction with streptomycin, it is the general opinion in our clinic that tolerance to tuberculin increases during streptomycin treatment

St Sophia's Children's Hospital
Athens K CHOREMIS

8 Spies T D, Stone R E Lopez G G, Milanes, F Toca R L Reborodo A *Lancet* Aug 12 1950 p 241
9 Choremis K Zervos N Constantinides V Pantazis S *Ibid* 1948 ii 595

BACTERIAL SYNTHESIS OF VITAMIN B_{12}

SIR,—I have read with great interest the article by Dr Dyke and his colleagues, in your issue of March 18, and I should like to add some comments

In a bacteriological investigation of the mucosa of fresh pig stomach and of three commercial preparations from different factories of pig stomach against pernicious anæmia, I have constantly found considerable numbers of only two types of bacteria—*Bacillus subtilis* and one of the non pathogenic corynebacteria I therefore presume that one of these bacteria may be identical with the "intrinsic factor" [1] Later investigations have shown that both these bacteria synthesise vitamin B_{12} in amounts that may be supposed to be important for the concentration of B_{12} in intestinal mucosa

Clinical investigations with strains of these bacteria in cases of pernicious anæmia have hitherto not given convincing results, but the provisional results indicate that these bacteria, besides producing vitamin B_{12} by their synthesis of antibiotics, are able to control unwanted bacterial growth in the intestinal mucosa in these cases

This has led to the following working hypothesis of the etiology of pernicious anæmia if vitamin B_{12} is to be absorbed it must be present in intestinal mucosa in a concentration higher than that in the tissues This is the case in the normal organism, where the intestinal mucosa is infected with B_{12} producing strains In the diseased organism these strains are expelled from the mucosa and replaced by B_{12} consuming *Bact coli* and lactobacilli, and this mucosa forms a barrier to the absorption of B_{12} from the intestinal contents

Further investigations are being made on the basis of this working hypothesis

Microbiological Laboratory
Ferrosan Ltd Copenhagen B NOER
Chief Microbiologist

1 Noer B *Dansk Tidsskr Farm* 1949 23 111

HOSPITAL ADMINISTRATION

SIR,—It would be difficult to overrate the importance of your correspondent's article of Sept 30 under the title Preface to Hospital Administration It is stimulating chiefly because it insists that hospital administration is one thing, and that the services and crafts which go to meet a hospital's physical problems are another These functions are all too frequently confused, and the confusion has increased because there has been limited experience in procedures for meeting the growing needs of the Ministry of Health for standardised practices and tabulated information

Dr MacWilliam's thoughtful letter (Nov 11) is an evidence that in the present transition in the health services this distinction is likely to be smothered in a welter of administrative conveniences and methods Readers of the principles set out by Dr MacWilliam are likely to accept them without, perhaps, realising their far reaching implications The questions posed by him focus our attention on some of the difficulties and dangers of the present attempt to weld together two different conceptions of hospital practice and control But the distinctions between the voluntary hospital and local authority hospital lay not in accountancy techniques, budgetary controls, and other tools of administration The distinction was rather in responsibility On the one hand this responsibility was carried entirely by the hospital board and its administration, and was immediately affected by public reactions to its policies On the other hand there was an administration responsible in an auditing sense to a financial authority outside the hospital, elected for other than hospital tasks, and having no special sanction or experience in the field of economy consistent with the requirements of the sick Dr MacWilliam's analysis demonstrates some important

aspects of the hospital problem, but does not, I am afraid, lessen the confusion between administration and administrative machinery

The Preface to Hospital Administration, rightly in my opinion, forces us back to the single minded approach of Florence Nightingale The changes in medicine and in the scope of hospitals in the last hundred years do not affect the fundamental purpose of hospital administration, described in her words "Administration is intended to *enforce* economy as far as it is consistent with the requirements of the sick" The plea of the writer of the Preface is that we must give more enlightened attention to that enforced economy His whole thesis is the inherent unity of administration There are not medical, financial, clerical, and other administrations, as suggested by Dr MacWilliam In fact it is the administrator, correctly advised, who must ensure that all aspects of the requirements of the sick shall be in competent hands It is not his duty to see that nurses nurse or cooks cook, but rather to equate the needs of each with the policy and income of the hospital

In his Chadwick lecture, annotated in your issue of Nov 11, Dr Goodman outlined the system of public health administration on the Continent, and called attention to the different ways in which administration is viewed abroad and in Britain—a science as against 'an art (or even a craft)" In that difference lies the answer as to the kind of person and his disciplines required for successful administration How inadequate would be our understanding of Florence Nightingale if we attempted to account for her immeasurable contribution to hospital management solely from her nursing vocation! For we would overlook her "grown up man's attitude" of reflection upon principles her clarity of mind and purpose, her selfless leadership, and, fundamentally, her courage

Successful administration does not, as Dr MacWilliam seems to suggest, need to admit the limitation of doctors accountants, and so forth, for there are no limitations to their contributions as specialists and technicians in their own fields. The task of administration is not simply to add up the answers given to medical questions by doctors, and to financial questions by accountants but to inspire the combination of those answers which will ensure the "enlightened pursuit of economy"

The safeguarding of the interests of the consumer would appear, according to Dr MacWilliam, to be a task for the administrator, whereas we need go no further than the words of Florence Nightingale 'Publicity and the collision resulting from publicity are the best guardians of the interests of the sick." If reflection and experience are needed for (in Collingwood s words) "a grown up man's attitude' to the complexities described in the Preface to Hospital Administration and the observations of Dr MacWilliam, then the 'grown up man' who shall be able as administrator to pursue with enlightenment the "enforced economy" will not be found more in one class amongst the many professions that go to make up the complete hospital or health service than in another This is amply demonstrated by many names which come to mind He will be found equally commonly (or rarely) among doctors accountants, economists, lawyers, and so forth It is from administrative competence and experience that he must achieve balance and proportion in the many competing needs of the hospital—or rather of the patient In addition, hospital administration must relate the requirements of the sick to local authorities' responsibilities in preventive medicine and the general practitioner s impact on the life of the potential patient

To comprehend the interrelations of the specialties, the tasks of the doctors the work of the matron the meaning of the financial statement the responsibilities of the committee is the administrator's job—a job quite distinct from the practice of the sciences, arts, and crafts performed by these specialists He will understand their needs, because his experience must include a close study of every activity in the hospital To none can the hospital's administration delegate execution and responsibility in the enforced pursuit of an economy which shall be consistent with the requirements of the sick As the administrator must practise enlightened economy—let us return to the original meaning of the word—he must manage the house in such a way as to ensure that these requirements shall be met

St Mary s Hospitals
Manchester

A R J WISE
Superintendent and Secretary

TUBERCULIN AND STREPTOMYCIN IN TUBERCULOUS MENINGITIS

SIR,—The article of Aug 19 by Dr Smith and Dr Vollum may well herald an important advance in the treatment of tuberculosis For this reason, some work that I have attempted at Black Notley Hospital may be of interest, though no claims are made for it

In 1942, having for many years tried various types of tuberculin with no success I began to try, on theoretical grounds, a very carefully filtered and bacteriologically tested filtrate of tuberculous pus from cold abscesses, given subcutaneously I had seen, as I thought, some general as well as local benefit after operations on tuberculous bone in patients with multiple tuberculous lesions, and believed that this might have been due in part to a specific auto inoculative effect I hoped that the filtrate might produce a similar effect

It has been used most often for patients with severe disease not responding to ordinary methods of treatment, I have never seen any harm due to its use and have suspected that benefit has followed on some occasions No local or general reactions have been seen except rarely a mild protein reaction, and in one patient a possible allergic reaction without constitutional disturbance I have used it to augment streptomycin treatment in a small series of patients suffering from tuberculous meningitis whom I have treated here The recovery rate of these patients has been higher than the accepted normal recovery rate, on the other hand, good results have also been obtained in patients treated with streptomycin only

The following are brief accounts of these cases

CASE 1 —Aged 10 years Admitted on Dec 20, 1948 with established tuberculous meningitis Tubercle bacilli present in cerebrospinal fluid (C.S.F) (culture and guineapig) Intrathecal and intramuscular streptomycin given and also during the first month of treatment nine injections of filtrate 0·5 ml. diluted with equal amount of sterile saline Recovered and discharged on Sept 27 1949 Well since

CASE 2 —Aged 7 years Admitted on Oct 9, 1948 with established meningitis Tubercle bacilli present in C S.F (culture and guineapig) Treated with intramuscular and intrathecal streptomycin During first month of treatment had also nine injections of filtrate 0 5 ml diluted with equal amount of sterile saline Recovered and discharged on Sept 28 1949 Well since

CASE 3 —Aged 43 years Decompression operation for tuberculous spondylitis with paraplegia on June 17 1949 Streptomycin umbrella before and after operation for twenty six days Onset of tuberculous meningitis six weeks after operation Tubercle bacilli present in C S F (guineapig positive) Treated with intrathecal and intramuscular streptomycin. During first three months of treatment she also had thirty six injections of filtrate, 0 75 ml in an equal amount of sterile saline Discharged well on May 23, 1950 Has remained well Also recovered from paraplegia

CASE 4 —Aged 4 years Admitted on Dec 1 1949 suffering from tuberculous meningitis Tubercle bacilli present in C S.F (guineapig positive) Treated with intrathecal and intramuscular streptomycin During first two months of treatment he also received nineteen injections of filtrate, 0 5 ml diluted with equal part of sterile saline Patient has

been ambulant for four months Apparently full recovery except that cells in C S F are still 20 per c mm

CASE 5 —Aged 15 years Admitted with very active tuberculosis of the uterus for which biopsy was performed under a streptomycin "umbrella" on June 26, 1950 The biopsy findings were positive for tuberculosis Onset of tuberculous meningitis on July 3 Streptomycin given daily in doses of 100 mg intrathecally and 1 g intramuscularly Spinal block threatened and streptomycin level in C.S.F rose to 32 µg per ml Dose of intrathecal streptomycin was decreased and of filtrate injections was increased to daily injections until some local allergic reaction seemed to appear, when these injections were stopped The dose of filtrate was 1 ml diluted with equal amount of sterile saline C S F became clear, and patient's condition improved until there are now no abnormal symptoms or signs except in the C S F Tubercle bacilli have not yet been found in the C S.F

CASE 6 —Aged 14 months Onset of tuberculous meningitis on Oct 20, 1948 Intrathecal and intramuscular streptomycin started Child's condition deteriorated, bilateral papillœdema and blindness developed, and there were extensive pareses Four doses of filtrate given in November but supply ran out Filtrate recommenced on Dec 23 Eleven injections given, each of 0 35 ml diluted with equal amount of saline Improvement noted Cell count in C S F progressively diminished, but signs of gross changes in the central nervous system persisted Died of intercurrent bronchitis on Jan. 23, 1949 At post mortem examination diagnosis of tuberculous meningitis confirmed, amount of exudate in interpeduncular space not conspicuous

In the next three cases tuberculous meningitis developed after injections of filtrate had been given in the course of treatment for tuberculosis elsewhere

CASE 7 —Aged 24 years During course of treatment for tuberculous hip had nineteen injections of filtrate Later had osteotomy of hip, which was followed by tuberculous meningitis Transferred to special centre where she recovered Tubercle bacilli never found in C S.F, but were present in pus from hip

CASE 8 —Aged 12 years Treated between 1945 and 1948 for tuberculous hip, during 1946 course of filtrate injections was given In 1948 developed tuberculous meningitis Tubercle bacilli found in C S F Transferred to special centre Recovered

CASE 9 —Aged 10 years Had been treated from 1942 to 1946 for tuberculous spondylitis In 1942 had had five minimal injections of filtrate Readmitted in 1948 with tuberculous meningitis Transferred to a special centre where he died Diagnosis confirmed at post-mortem examination

Lastly, there are four cases in which no filtrate was given at any time, and one of a patient who had recovered from tuberculous meningitis but who was given some filtrate injections later in the course of treatment for multiple lesions

CASE 10 —Aged 15 years Tubercle bacilli found in C S F Full recovery on streptomycin treatment

CASE 11 —Admitted with multiple tuberculous lesions, unilateral ptosis, and increased number of cells in C S F Tubercle bacilli not found in C S F With streptomycin therapy recovered from presumed tuberculous meningitis Tubercle bacilli present in sputum Given some filtrate injections later for multiple lesions

CASE 12 —Aged 11 months Admitted with presumed tuberculous meningitis and tuberculosis of the knee Tubercle bacilli not found in C S F Treated with streptomycin Died, no post-mortem examination

CASE 13 —Aged 10 years Admitted in 1947 with tuberculous arthritis of knee Developed meningitis Transferred to a special centre Recovered

CASE 14 —Aged 4 years Treated for lupus of face Developed tuberculous meningitis (1947) and transferred to special centre Recovered

SIX patients, therefore, had treatment with streptomycin and filtrate Of these, three have recovered, one has almost fully recovered, one with presumed tuberculous meningitis is recovering, and one infant who received filtrate late in her illness died Of three patients who received filtrate injections in the course of treatment for tuberculosis but who later developed meningitis two recovered, the third, a child who died, had six years previously received only a few minimal injections On the other hand, of five patients who had no filtrate treatment four recovered

No claim is made for the efficacy of this filtrate At present laboratory investigations are being considered, and if evidence is found that it has therapeutic value, a further report will follow

Black Notley Hospital
Braintree, Essex. M C WILKINSON

TROPHIC AND TROPIC

SIR,—I observe that it is becoming current practice to speak of the action of a hormone in controlling an endocrine gland as *trophic* (e g, *thyrotrophic hormone* and *gonadotrophins*), and that this usage is common not only in America but also in this country

This is surely a misuse of words, from a confusion between trophic action (τροφή nourishment) which is concerned with nutrition, as in "trophic nerves," and tropism (τρόπος a turn, in biology, the movement in a particular direction in response to some stimulus), which connotes control The pituitary does not nourish the thyroid or the ovary though it does control their activity Is it too late to revert to *thyrotropic* and *gonadotropic*, and the like?

Department of Pathology J HENRY DIBLE
Postgraduate Medical School of London W 12

VEGETATIVE REGULATION OF THE CENTRAL NERVOUS SYSTEM

SIR,—It is known that single organs (e g, heart, lungs liver, and kidneys) function under the control of the vegetative nervous system, the regulation being exercised directly by nervous influences (sympathetic and parasympathetic) or indirectly (humoral), though the proportion of each component may vary When several organs are connected together in a system, functional adaptation is necessary to meet the needs of the whole organism, and this adaptation too is accomplished under the influence of the vegetative nervous system

Up till now, the vegetative nervous system has been accepted as affecting only the viscera, the blood vessels, the sweat glands, and other non nervous organs not subject to voluntary control, while its significance for the central nervous system itself has not received any attention Rein[1] has written of the autonomic nervous system "Today one may accept as definite that there is hardly any part of any tissue which is not vegetatively innervated" This statement is applicable not only to organs supplied by peripheral vegetative nerves, but also to the central nervous system itself, especially the cortex Hess has shown that stimulation of vegetative centres of the diencephalon produces effects which we accept as vegetative phenomena (e g, increase in the heart and respiration rates) and we can therefore accept, on the same level, the observation of Murphy and Gellhorn[2] that when the hypothalamus is stimulated the productivity of certain areas of the cortex is altered, and that changes in the functioning of these same areas take place, only with simultaneous sympathetic effects at the periphery

These and other findings lead one to conclude that the cortex is subject to vegetative regulation, that this "central nervous vegetativum" is connected with the vegetative centres of the diencephalon, and that by these means all the organ systems including the central nervous system (cortex) are coördinated The idea is further supported by the finding of myself and Will[3] that electro shock primarily affects the diencephalon, and that the reaction level (*Reaktionslage*) of the cortex (e g, that of the area striata examined in the formation of the action potentials caused by rhythmically flashing

1 Rein H Einführung in die Physiologie des Menschen Berlin 1941
2 Murphy J P Gellhorn E *J Neurophysiol* 1945 8 341
3 Schuchardt E Will, R *Dtsch Z Nervenheilk* 1950 163 245

a light on the eye) reveals a condition which can only be explained by assuming the existence of vegetative regulation

Anatomisches Institut Giessen E SCHUCHARDT

REVOLT AT KINGSTON

SIR,—Unfortunately Dr Stark Murray's letter last week shows little sign of his having benefited from any of the wisdom of your leading article of Nov 11

Rarely, if ever, do "revolts" arise from purely unilateral causes, and surely this "revolt," if not based on any unwisdom in the decision, must imply some inadequacy in the regional hospital board's efforts to enlist the coöperation of all the persons likely to be affected To take two examples from Dr Stark Murray's letter the assistance of the press can surely be secured more effectively than by handing its representatives six foolscap pages, and surely the board can exert more effective medical leadership than to announce such a decision when "the staff at Kingston Victoria have never held a meeting to discuss this question"

We all hope that this and other regional boards will always remember their responsibilities, not only for correct decisions, but also for leadership, more especially when the led show signs of being refractory

St Margaret's Twickenham Bridge Middlesex RUSSELL FRASER

INTEGRATIVE SOCIAL RESEARCH

SIR,—The effort to follow up the constructive social work of Wilfred Trotter continues at Braziers Park, and a second discussion and conference will be held there during the weekend Dec 8–10

It may be of interest to a larger circle of your readers than those who can attend such a conference to mention that a little inquiry into the treatment of Trotter's work by professional sociologists has revealed a rather curious fact there seems to be no disposition on their part to take seriously the implications of Trotter's conception of a unitary organism based upon a number of human minds considered in conjunction with the tendency of maturing minds to differentiate either towards a resistive or towards a 'mentally unstable' type, with the notable exception of Sigmund Freud

I shall be very glad to send an invitation to this conference to anyone interested

J NORMAN GLAISTER
Director of Studies
Braziers Park School of Integrative Social Research
Ipsden Oxon

STUDY OF DELINQUENCY

SIR,—While Dr Stott is to be congratulated on his provocative study of delinquency, and particularly on his insistence on observation and avoidance of "blanket" terms, I do deplore the unfair and one sided picture of clinical psychiatry that is proffered

A bias against doctors appears to raise its head, almost worthy of the late G B Shaw Is it really true that the 'psychiatric examination at the best discovers nothing that the most ordinary inquiry into the behaviour of the patient would not reveal"? In my own experience I have found the various projection techniques very valuable substitutes for actual behaviour studies I am astonished that Dr Stott imagines that the standard treatment interview for the adolescent delinquent is an hour on the analytic couch Such a phantasy would be comic if it were not so grotesque Dr Stott's experience of the psychiatric treatment of delinquents appears strangely limited

In my practice which includes boys and girls from hostels for maladjusted children and from approved schools I spend a very considerable proportion of the session in consultations with the wardens, matrons, housemasters, and headmasters, and discuss the family situations not only with the patients themselves, but also with the probation officers and other welfare officers who have visited the homes, as far as my knowledge goes this is current practice amongst the colleagues who are doing similar work

Dr Stott speaks of the "inadequacies of our old-fashioned brethren" whose ideas and methods have been borrowed from physical medicine, but a few paragraphs back he had been denouncing their mystic beliefs about the value of analysis, or the reality of character traits Materialists or mystics? Can he have it both ways? I note that Dr Stott is not without his own beliefs and disbeliefs he apparently does not believe in projection techniques but does believe in habits Incidentally when does a habit become irreversible? And what is the difference between an irreversible habit and a character trait? Or is an irreversible habit merely a "dominant pattern of reaction"?

While warmly commending Dr Stott's clinical observations, I must correct the biased picture of psychiatric practice presented in his paper Dr Stott's experience, some of it obviously based on hearsay evidence, has been unfortunate, and it is to be hoped that a wider experience will lead him to modify the generalisations based on a few particular instances, and that he will regain mastery of his "statistical steed"

Bristol FRANK BODMAN

CHLORAMPHENICOL IN TYPHOID FEVER

SIR,—Last week's case report by Dr Colquhoun and Dr Weetch undoubtedly presents interesting features It would be more interesting still if they would explain how and why a case of typhoid fever came to be treated for a period of two months in a large general hospital rather than in a hospital for infectious diseases where the staff are specially trained in the precautions necessary to avoid further spread of the infection

JAMES GRANT
Gateshead Medical Officer of Health

"SITTING IN" ON PRACTICES

SIR,—In his report on the state of general practice, Collings[1] described his method of "sitting in" with a general practitioner at work Collings was concerned to assess standards of practice, but it occurred to us that the same technique could be used as a means of postgraduate education, and for sharing knowledge between practitioners

Of the new illnesses seen by the practitioner in his daily work, 85–90% are treated by him from beginning to end On entering practice doctors have only general ideas about handling such illnesses, which are not regularly seen during their hospital training, but in time the doctor invents for himself methods of handling patients short-cuts to diagnosis, and techniques of treatment These personal advances do not ordinarily enter into the general body of medical knowledge and, with the practitioner isolated as he now is, they die with him

One of us therefore 'sat in" on the practice of the other for a week attending surgeries, accompanying him on visits, questioning patients, making examinations, discussing diagnosis and treatment, and comparing methods of organising work We found this greatly to our mutual advantage, and propose a return visit next year

In the correspondence following the Collings report it was suggested that patients might resent the presence of a second doctor This was not found to be so After a friendly word of introduction, no patient seemed in any way inhibited by the presence of a professional colleague

1 Collings J S *Lancet* 1950 i 555

While the general practitioner can, by reading, keep himself reasonably *au fait* with recent work in the specialties, he can learn of advances in general practice only by contact with his fellow practitioners, and we feel that this method of postgraduate instruction merits a wider trial The postgraduate dean of a university medical school might maintain a list of general practitioners willing to teach as they worked, and by introducing countryman to townsman, and Englishman to Scot, he might spread the personal advances of the few among the practices of the many Recognition of this type of refresher course should be followed by the granting of subsistence allowance and remuneration of a locum tenens, which can already be claimed by those attending such courses in hospitals

Finally, the system might be extended to the hospital worker, junior or senior From the general practitioner the specialist might gain a new perspective, while the family doctor would learn, through his own cases, of the latest advances in the visitor's specialty

Lowestoft N B EASTWOOD
Birmingham R J F H PINSENT

REGISTRARS

SIR,—Your recent editorials do less than justice to the cause of the registrars You appear to have lost sight of the fact that circular R H B (50) 106 makes a drastic cut in the numbers of doctors who are today giving good and mostly whole time service to the hospitals It is not particularly the arbitrary nature but the extent of the proposed cut which is the cause of anxiety You ignore the immediate issue—that this cut will drastically reduce the scope and quality of the already existing hospital and specialist services—as well as the fact that expansion in the future will be made more difficult

The registrars are quite prepared to consider that there should be a proper review of the whole position They are not likely to regard the Ministry's circular as a proper review, or to agree that adequate consultations have taken place with those responsible for the hospital services or those representing general medical services Both these complementary aspects of the National Health Service would be considerably altered if the circular were carried into effect

It is difficult to follow your arguments about "economic facts" (Nov 25) This circular simply proposes to cut the number of registrars by "upwards" of 1100 These registrars will be compelled to seek some other employment Most will rightly wish to do so in their own country No saving can be effected by transferring the pay accounts of these doctors to a different column in the National Health Service ledger Moreover, it is difficult to persuade registrars of the economic necessity for this step when it follows within a few weeks the secret distribution of merit awards against which many distinguished voices in the profession were raised and whose total amount would go far to establish fresh consultant posts

It is pointless to relate future registrar posts to the number of consultant posts likely to be available when the number of such posts is already inadequate for the work done [1] and much of it is therefore necessarily carried out by existing registrars Visiting committees are already attempting to assess this need, and no reason is given for the necessity of taking this precipitate action in advance of their report The proper preliminary steps would be to establish the number of consultant posts necessary to give an adequate service to the public even on the present standard of service, create the new posts involved, fill them from the ranks of the trained registrars, and then consider what must be done to bring the number remaining into line with future possibilities

The alternative measure proposed for staffing hospitals in place of the 800 senior registrars, most of whom are engaged full time, is the employment of part time general practitioners It is quite clear that the necessary numbers do not exist today, nor are they likely to live in the places where they are needed Indeed, it is disturbing that it can be suggested that there are doctors with the higher qualifications and necessary experience who are not doing more than part time work today in general practice

In the appendix attached to this circular no mention is made of the fact that the clinical assistantships might be available to displaced registrars Indeed, the only suggestions made are that the sacked registrars can either join the Army or leave their country Moreover, the appendix gives examples of vacancies which exist today and which have existed for some time and which no present registrar has been tempted to apply for because the terms and conditions of service are not sufficiently attractive The position was neatly summed up by the chairman of the Medical Priorities Committee Lord Haden Guest "The usual objections made to Service life, besides unfavourable pay, were that it cut a man off from his profession, limited his medical experience, and took him abroad Then when he was between 50 and 60 it left him stranded with a smallish pension and nowhere to go Much the same objection applied to the Colonial Medical Services" [2] Registrars would agree that the proper way to fill these jobs is to raise their standard and not to force doctors to accept them as an alternative to unemployment

Dr Talbot Rogers's thoughtful contribution to your last issue is to be welcomed as suggesting a partial solution to one side of this problem A number of registrars have always chosen the alternative of general practice of their own free will, and a considerable number have always known that they have this alternative before them if they find their attempts to specialise either uncongenial or unrewarding What is new in this circular is that many registrars will be forced to take this course against their will A number, too, who have every reason to believe that they would make good consultants from their experience of the work, are now to find themselves dismissed either for geographical reasons or because they have finished the prescribed course of training and no further vacancy exists to enable them to continue to give their best service

It is probably correct to argue that the difficulties of entering into general practice hindered a number of registrars, particularly those in their earlier years, from making this choice Nor can such reports as that of Dr Collings [3] encourage these keen young men However, Dr Talbot Rogers thinks that the main stumbling blocks to entering general practice are lack of suitable premises and methods of payment These two difficulties must be overcome, but it is hard to agree that his solutions are revolutionary, they are simply novel A much more revolutionary and none the less more acceptable solution would be to start the building of health centres where they are most needed and offer the choice of a salary as an alternative to capitation fees to those willing to work in them It is not likely that a patchwork attempt to get other bodies such as R H B S to ease their consciences by contributing to the financial support of their displaced erstwhile servants will be satisfactory

One other major weakness of Dr Talbot Rogers's approach is that if R H B S in consultation with local medical committees—i e, *the representatives of those already in practice*—find that there is a suitable general practitioner already established, he is to get the available

1 National Health Service The Development of Consultant Services Ministry of Health H M Stationery Office 1950

2 See *Lancet* Oct 28 1950 p 493
3 Collings J S *Ibid* 1950 i 555

clinical assistant post without advertisement to others No doubt Dr Talbot Rogers did not mean this but that is what his article implies Furthermore, the local medical committee, financially interested in what the newcomer takes out of the "pool," is to be the judge of the limits to be placed on the newcomer's general practice Registrars are to be neither fully fledged specialists nor fully fledged general practitioners The only way in which such a person could be happily and usefully employed would be as part of a team of doctors working together at a health centre, not competing one against another but enjoying an agreed salary and performing a mutually agreed amount of work The most important contribution of the article is the realisation that the urgent need exists today for a revolutionary change in the whole attitude towards coöperation between hospital and specialist services on the one hand and the general medical services on the other Combined machinery to deal with the whole problem should be set up on a more authoritative and permanent basis than that of liaison Changes are necessary, and, even though they clearly cannot be carried out on the lines of the Minister's circular they will affect specialists and general practitioners alike It is time that the profession learnt to work in concert to determine its own future

Whatever the ultimate solution it is clear that circular R.H.B (50) 106 is unworkable and all organisations concerned with the present and future medical services of this country should lose no time in urging the Ministry to suspend the action of this circular until further consultations take place The position is critical, for many appointments will shortly terminate and no openings at all will be available if this uncertainty continues New specialist staff must be appointed, at least adequate to continue the work which the hospitals do today, and the machinery for combined action of local medical committees executive councils, and the R.H.B.s and boards of governors should be set up If these measures are taken first, the profession acting together is capable of solving the problem which is before it in such a way that those registrars who do not secure the further posts to be created can yet be assured of a useful place in the medical services of this country in which their skills can be adequately used I would finally plead that the registrars themselves be invited to make their contribution to the solution of a problem in which they are so particularly involved.

London W I C GILLILAND

SIR,—It has been suggested that the Ministry of Health circular on registrars was issued at the behest of the Treasury Whether or not this is true, it seems reasonable to ask if the Minister availed himself of any expert professional advice before recommending this course If he was guided by expert advice, then the threatened registrars are entitled to know who his advisers were and how they justify these recommendations If, on the contrary, the Minister adopted this panic measure solely at the crack of the Treasury whip then one must surely doubt whether he has the true interests of the service at heart Anyone familiar with the work done by the majority of registrars would realise that the proposed drastic cut in their numbers can only lead to serious curtailment of the hospital service

At the present time there is some confusion because the registrar body subserves two functions Firstly there is a large number of senior men (some of whom are long qualified and very experienced) who are apprenticed to established specialists of some repute and, secondly, there are others who are subserving the function of R.M.O.s and R.S.O.s in district hospitals In addition, in some district hospitals there are general practitioners who for the purposes of salary are graded as registrars It would seem that the first group, consisting chiefly of senior registrars (who are truly trainee specialists), should bear some numerical relation to future consultant vacancies but it is arguable what this relationship should be The second group are doing important hospital work in assisting consultants, and helping in the training of junior resident staff, some of these men may subsequently pass on to trainee consultant appointments but the remainder will go into general practice and other fields of medicine These two groups are at present included in the generic term 'registrar," and the future efficiency of the health service depends upon the wise and just management of both groups Some of our present difficulties stem from the fact that a proportion of men holding ostensibly training posts are being treated as a valuable source of hospital labour While not denying that this work gives these men some useful experience it is questionable how far hospitals which use their registrars in this fashion can provide adequate consultant supervision and apprenticeship Some hospitals with senior registrars have neither suitable facilities nor good enough consultant staff to give a thorough specialist training, and yet such hospitals would often afford valuable experience to senior registrars already trained elsewhere The benefit in these cases would be by no means one sided for such men would do much to improve the standards of the less efficient or smaller hospitals to which they were seconded in the later stages of their training

While there is perhaps, a case for some limitation in the number of higher-grade trainee consultants in the way I have suggested, there seems no possible justification for making the over-all reduction proposed by the Ministry The removal of large numbers of registrars will, in most cases, deprive the hospitals of help which they will have to obtain in some other form if they are not to lower the standards of their service At least one of the regional hospital boards has recently held a meeting of consultants at which the majority of those present expressed the view that a literal interpretation of the Ministry of Health instruction would lead to a reduction of up to 40% of the services available in the various departments of the hospitals in that region

The dangers inherent in the Ministry of Health undertaking responsibility for medical educational matters of which it has no knowledge or experience were mentioned by Sir Francis Fraser [1] more than four years ago It seems intolerable that any Minister should wield such powers in respect of medical education While the Minister is ultimately responsible for the health service, the proper training and provision of specialists is a matter for the expert attention of the profession alone Surely this is an important field of activity for the Royal Colleges, and yet they have sometimes seemed strangely mute in recent years

Does not the proper solution of this problem lie in making some purely professional body responsible for all matters connected with postgraduate training? Only thus can we protect our specialist services from the whims of the Minister and the dictates of the Treasury The future high standards of consultant work and much of the freedom of medical research, are jeopardised by the present powers of the Minister and it is plainly essential to protect them both from all forms of political interference and patronage

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SIR —The Gordian knot of excess registrars is being cut in high style In any scheme whereby progress depends on selection there are inevitably some who become eliminated In this case many hundreds of men, not all young, and many married and with children have been led by official and semi official statements

1 *Brit med J* 1946 II 354

While the general practitioner can, by reading, keep himself reasonably *au fait* with recent work in the specialties, he can learn of advances in general practice only by contact with his fellow practitioners, and we feel that this method of postgraduate instruction merits a wider trial The postgraduate dean of a university medical school might maintain a list of general practitioners willing to teach as they worked, and by introducing countryman to townsman, and Englishman to Scot, he might spread the personal advances of the few among the practices of the many Recognition of this type of refresher course should be followed by the granting of subsistence allowance and remuneration of a locum tenens, which can already be claimed by those attending such courses in hospitals

Finally, the system might be extended to the hospital worker, junior or senior From the general practitioner the specialist might gain a new perspective, while the family doctor would learn, through his own cases, of the latest advances in the visitor's specialty

Lowestoft N B EASTWOOD
Birmingham R J F H PINSENT

REGISTRARS

SIR,—Your recent editorials do less than justice to the cause of the registrars You appear to have lost sight of the fact that circular R H B (50) 106 makes a drastic cut in the numbers of doctors who are today giving good and mostly whole time service to the hospitals It is not particularly the arbitrary nature but the extent of the proposed cut which is the cause of anxiety You ignore the immediate issue—that this cut will drastically reduce the scope and quality of the already existing hospital and specialist services—as well as the fact that expansion in the future will be made more difficult

The registrars are quite prepared to consider that there should be a proper review of the whole position They are not likely to regard the Ministry's circular as a proper review, or to agree that adequate consultations have taken place with those responsible for the hospital services or those representing general medical services Both these complementary aspects of the National Health Service would be considerably altered if the circular were carried into effect

It is difficult to follow your arguments about "economic facts" (Nov 25) This circular simply proposes to cut the number of registrars by "upwards" of 1100 These registrars will be compelled to seek some other employment Most will rightly wish to do so in their own country No saving can be effected by transferring the pay accounts of these doctors to a different column in the National Health Service ledger Moreover, it is difficult to persuade registrars of the economic necessity for this step when it follows within a few weeks the secret distribution of merit awards against which many distinguished voices in the profession were raised and whose total amount would go far to establish fresh consultant posts

It is pointless to relate future registrar posts to the number of consultant posts likely to be available when the number of such posts is already inadequate for the work done[1] and much of it is therefore necessarily carried out by existing registrars Visiting committees are already attempting to assess this need, and no reason is given for the necessity of taking this precipitate action in advance of their report The proper preliminary steps would be to establish the number of consultant posts necessary to give an adequate service to the public even on the present standard of service, create the new posts involved, fill them from the ranks of the trained registrars, and then consider what must be done to bring the number remaining into line with future possibilities

The alternative measure proposed for staffing hospitals in place of the 800 senior registrars, most of whom are engaged full time, is the employment of part time general practitioners It is quite clear that the necessary numbers do not exist today, nor are they likely to live in the places where they are needed Indeed, it is disturbing that it can be suggested that there are doctors with the higher qualifications and necessary experience who are not doing more than part time work today in general practice

In the appendix attached to this circular no mention is made of the fact that the clinical assistantships might be available to displaced registrars Indeed, the only suggestions made are that the sacked registrars can either join the Army or leave their country Moreover, the appendix gives examples of vacancies which exist today and which have existed for some time and which no present registrar has been tempted to apply for because the terms and conditions of service are not sufficiently attractive The position was neatly summed up by the chairman of the Medical Priorities Committee, Lord Haden Guest "The usual objections made to Service life, besides unfavourable pay, were that it cut a man off from his profession, limited his medical experience, and took him abroad Then when he was between 50 and 60 it left him stranded with a smallish pension and nowhere to go Much the same objection applied to the Colonial Medical Services"[2] Registrars would agree that the proper way to fill these jobs is to raise their standard and not to force doctors to accept them as an alternative to unemployment

Dr Talbot Rogers's thoughtful contribution to your last issue is to be welcomed as suggesting a partial solution to one side of this problem A number of registrars have always chosen the alternative of general practice of their own free will, and a considerable number have always known that they have this alternative before them if they find their attempts to specialise either uncongenial or unrewarding What is new in this circular is that many registrars will be forced to take this course against their will A number, too, who have every reason to believe that they would make good consultants from their experience of the work, are now to find themselves dismissed either for geographical reasons or because they have finished the prescribed course of training and no further vacancy exists to enable them to continue to give their best service

It is probably correct to argue that the difficulties of entering into general practice hindered a number of registrars, particularly those in their earlier years, from making this choice Nor can such reports as that of Dr Collings[3] encourage these keen young men However, Dr Talbot Rogers thinks that the main stumbling blocks to entering general practice are lack of suitable premises and methods of payment These two difficulties must be overcome, but it is hard to agree that his solutions are revolutionary, they are simply novel A much more revolutionary and none the less more acceptable solution would be to start the building of health centres where they are most needed and offer the choice of a salary as an alternative to capitation fees to those willing to work in them It is not likely that a patchwork attempt to get other bodies such as R H B S to ease their consciences by contributing to the financial support of their displaced erstwhile servants will be satisfactory

One other major weakness of Dr Talbot Rogers's approach is that if R H B S in consultation with local medical committees—i e, the representatives of those already in practice—find that there is a suitable general practitioner already established, he is to get the available

1 National Health Service The Development of Consultant Services Ministry of Health H M. Stationery Office 1950

2 See *Lancet* Oct. 28 1950 p 493
3 Collings J S *Ibid* 1950 i 555

clinical assistant post without advertisement to others No doubt Dr Talbot Rogers did not mean this but that is what his article implies Furthermore, the local medical committee, financially interested in what the newcomer takes out of the "pool," is to be the judge of the limits to be placed on the newcomer's general practice Registrars are to be neither fully fledged specialists nor fully fledged general practitioners The only way in which such a person could be happily and usefully employed would be as part of a team of doctors working together at a health centre, not competing one against another but enjoying an agreed salary and performing a mutually agreed amount of work The most important contribution of the article is the realisation that the urgent need exists today for a revolutionary change in the whole attitude towards coöperation between hospital and specialist services on the one hand and the general medical services on the other Combined machinery to deal with the whole problem should be set up on a more authoritative and permanent basis than that of liaison Changes are necessary, and, even though they clearly cannot be carried out on the lines of the Minister's circular they will affect specialists and general practitioners alike It is time that the profession learnt to work in concert to determine its own future

Whatever the ultimate solution, it is clear that circular R.H.B (50) 106 is unworkable, and all organisations concerned with the present and future medical services of this country should lose no time in urging the Ministry to suspend the action of this circular until further consultations take place The position is critical, for many appointments will shortly terminate and no openings at all will be available if this uncertainty continues New specialist staff must be appointed, at least adequate to continue the work which the hospitals do today, and the machinery for combined action of local medical committees, executive councils, and the R H B s and boards of governors should be set up If these measures are taken first, the profession acting together is capable of solving the problem which is before it in such a way that those registrars who do not secure the further posts to be created can yet be assured of a useful place in the medical services of this country in which their skills can be adequately used I would finally plead that the registrars themselves be invited to make their contribution to the solution of a problem in which they are so particularly involved

London W I C GILLILAND

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Does not the proper solution of this problem lie in making some purely professional body responsible for all matters connected with postgraduate training? Only thus can we protect our specialist services from the whims of the Minister and the dictates of the Treasury The future high standards of consultant work and much of the freedom of medical research, are jeopardised by the present powers of the Minister, and it is plainly essential to protect them both from all forms of political interference and patronage

Radlett Herts REGINALD S MURLEY

SIR —The Gordian knot of excess registrars is being cut in high style In any scheme whereby progress depends on selection there are inevitably some who become eliminated In this case many hundreds of men, not all young, and many married and with children, have been led by official and semi official statements

1 *Brit med J* 1946 II 354

to expect that there would be vacancies for nearly all in an expanding specialist service Many have already trained for some years Most are now to be rejected

Is there not a less unjust solution? The intake of new registrars could be cut to a trickle, comprising only the most promising young recruits, for, say, three years, while the posts falling vacant would have time to absorb present registrars of proved efficiency These men could meanwhile have the tenure of their present posts, or similar posts in other hospitals, extended for three years should they wish to continue

Admittedly this would cause hardship among young men wishing to start specialising during the next three years, but at least they would not have started their training and would not have been led on by promises unlikely to be fulfilled It would be the lesser injustice

Leicester DONALD MCGAVIN

SIR,—As there seems to be lack of knowledge and understanding of the work of the non teaching hospitals as at present constituted, we feel that now is the time to state some of the facts

The function of the non-teaching hospitals is to provide a complete hospital service for a given area They are no longer "chronic institutions" but modern general hospitals with large numbers of acute beds and a rapid turnover Since the war they have been developed to fulfil a most urgent need for hospital beds

The development of the non teaching hospitals has been made possible by the gradual formation of a registrar group, which is an integral part of the hospital staff and which cannot in any way be classified as solely trainee These registrars are almost entirely responsible for a 24 hour emergency service and for that day to day care of the patients which is beyond the experience of the housemen In addition they take a full share in the work of the outpatient and ancillary departments Thus, registrars are essential to the efficient working of the non teaching hospitals

The consultants, deprived of the assistance of their registrars, will be faced with an impossible burden of acute and outpatient work, unless their number is increased, and such an increase is evidently not contemplated[1] Part time clinical assistants, whose loyalties are divided between practice and hospital, cannot be adequate substitutes for whole time registrars The alternative is to increase the work of junior house officers beyond the limits of their experience For the patient this can only mean lowering the standard of his treatment, greater difficulty in securing a hospital bed, and increase in the length of his stay This is one of the aspects which your annotation of Oct 28 suggests may have to be ignored at present, but should this be allowed to happen there will be a reversion to the *status quo ante bellum*—which is surely a negation of the aim of the health service as far as it concerns the hospital service

If the hospital service is to continue, its needs will have to be met We suggest, therefore, that the establishment for registrars should be based upon the hospitals' requirements and on the *optimum* number of consultants, and that the full status of the registrar as a working member of the staff of the hospital should be recognised Consultant posts should be increased over a period, and filled from the ranks of the senior registrars, either by extending the present tenure of this office, or by creating a new post of junior consultant to bridge the gap between registrar and full consultant

The present lack of consultants is admitted, the remedy is to hand, and it is surely very shortsighted to reject it

Walton Hospital, Liverpool THE REGISTRARS

1 See *Lancet* Oct. 28 1950 p 493

SIR,—The Ministry's memorandum[1] is welcome in that it provides a basis for constructive criticism The plain truth is that by various devices the Ministry has, since 1945, encouraged medical men (mostly demobilised officers) to train for consultant appointments on the implied promise that appointments would be available for all who made the grade, it has created large numbers of established and supernumerary appointments to facilitate this training, and now, when there exists a vast pool of mature and fully trained would be consultants, it blandly asserts that absorption for the majority is impossible and advises, in effect, their summary dismissal The Ministry is fully entitled to second thoughts, albeit belated, in determining the numbers of consultants to be absorbed into a service which has to be paid for as well as provided, but it is not entitled to redress its past errors at the expense exclusively of that small but invaluable section of the profession which it now seeks to jettison, for there are other solutions

It is right that the establishment of senior registrars should henceforth be closely related to the likely number of consultant appointments In the Ministry's memorandum this is taken to involve a reduction from some 1400 to 600 Admittedly some of those to be cast off will not have made the grade, but this will not apply to many more who, being suitable for appointment, have nevertheless so far been unable to secure a consultant post Can the country or the service afford to lose this latter group, numbering perhaps several hundred?

The number of consultant appointments available depends on the amount of work attaching to each Part time consultants may have up to nine sessions a week, but there is no obligation on regional boards or boards of governors to advertise appointments carrying the maximum number of sessions Since July, 1948, however, the majority of appointments advertised have been full time or maximal part time at the option of the appointee By revising their practice and arranging their appointments on a basis of 5–6 sessions a week, the boards could increase by 50–100% the number of consultant appointments available If such a policy were pursued over the next five years *pari passu* with a more gradual reduction of senior registrar establishments, all suitable senior registrars might be absorbed into consultant posts It is true that their salary from such appointments would be little more than their salary as senior registrars, but they would have their status and the opportunity of other income, and it is very probable that in five years' time, with an expanding service and a decreased senior registrar establishment from which to recruit new consultants, the number of sessions would be gradually increased In any case, few of those affected would not prefer such an appointment to the threatened dismissal This procedure involves no additional expenditure from public funds, but it will result in a larger number of young consultants with smaller hospital commitments, nothing could be better calculated to facilitate an adequate hospital service with fewer registrars

The Ministry's memorandum states that 150 consultant appointments are likely to be made each year How is this figure arrived at? Lord Moran has stated that there are 5200 consultants on the basis of a 33 year span of consultant life (from 32 to 65 years) the replacement figure is over 150 annually This calculation takes no account of wastage through death or retirement, of additional posts or openings outside the service, or of the need to replace the natural wastage of senior hospital medical officers (it would appear that these comprise a further 2000,[2] calling for an annual replacement rate of about 60) If all these factors have been

1 See *Lancet* Nov 11 1950 p 537
2 *Ibid* Oct 28 1950 p 492

taken into account before deciding on the figure of 150, then the Ministry must be planning to concentrate more sessions with fewer consultants as replacement occurs, and this, as I have suggested, is incompatible with an equitable solution of the senior registrar problem

The memorandum calls for 1100 registrars and 600 senior registrars If we allow for wastage, fewer than 550 registrars will compete each year for 200 senior registrar appointments, great allowance must also be made for the fact that many trainee consultants will want to do a registrar's appointment in a different specialty from that of their final choice—e g, the gynæcologist and orthopædic surgeon should certainly do some general surgery, and likewise the neurologist, chest physician, dermatologist, and anæsthetist should do some general medicine Thus the appointment ratio from registrar to senior registrar grade is likely to be nearer 2 1 than 3 1 Is this enough? It certainly is not The essential point is that under the new arrangements a senior registrar will have a clear run to a consultant appointment, subject to his working well his only doubt will be the *place* of his appointment No individual will have lost much, and general practice will have gained, if after two years as a registrar a would be consultant fails to get farther, indeed, the value of entering practice with such experience will only be really evident when boards have been persuaded to reverse their present policy of exterminating general practitioner hospital beds What is important is that those responsible for selecting senior registrars should have the widest possible choice, comparable to that which appointments advisory committees now have in appointing consultants, for in effect that is what they will be doing For this reason an arbitrary limit to the ratio of registrar to senior registrar appointments is undesirable once the senior registrar establishment is brought into line with the potential consultant vacancies, and acceptance of any low ratio will at once defeat the whole concept of competitive selection for consultants In this connection, therefore, the only real change required is a scaling down of the excess of senior registrar to registrar appointments, and retention of senior registrar appointments only at those hospitals or groups of hospitals from which graduation to consultant status will be a sine qua non

The action which is needed is therefore fourfold

1 An immediate working party to determine what consultant appointments can be made available within the next few years on the revised basis I have suggested, without significant increase in public expenditure
2 Immediate revision of para 9 (ii) and para 10 of the Ministry's memorandum so that the reappointment of present senior registrars for further years will depend, not on the new establishment but on assessment of *each individual* as regards his eligibility for consultant status at the termination of his senior registrarship
3 The progressive replacement of senior registrars by registrars as the former are appointed to consultant posts or eliminated by individual review until the number of senior registrars remaining falls to the new establishment
4. The widest advertisement amongst registrar grades of the magnitude and highly competitive nature of the proficiency bar which will in future exist at the point of transition from registrar to senior registrar

With these arrangements we could weather reasonably well the difficulties of the next few years The hospital service would be little affected A maximum number of would be consultants will be given a chance if they are themselves prepared to accept the risk involved yet they will early on be brought face to face with their real obstacle And finally we shall not have broken faith with those who are now at, or near, the end of a difficult road and have proved themselves worthy

Lewisham Hospital,
London S E 13

A CAVENDISH
Consultant Surgeon

SIR,—Either registrars do useful work, and therefore specialist officers in the hospital service should increase, or else they do not If they do not, then the present situation is only a melancholy monument to the stupidity and dishonesty of politicians, medical as well as lay The displaced men will have to take what help they can get from their better placed colleagues (by precedent it is likely to be little) and exact what retribution they can from the politicians—with special reference, perhaps, to the author of the gratuitous insult contained in paragraph 12 of the Ministry's memorandum

If the other hypothesis is correct, and registrars actually do treat patients successfully, a wholesale dismissal of hospital staffs has many implications At least three of these require urgent consideration

1 Sacking hospital doctors will not finance the rearmament programme At a rough estimate it will save, as one of your correspondents has already said, about 1000 times £1000 yearly, that is, £1 million A due and modulated succession to consultant status might mean an annual expenditure, in ten years time, of £2½ million The total cost of our health service is around £400 million a year —much of which is wasted So dismissing hospital staffs is not only medical nonsense, but economic nonsense too, in this latter category, with all respect, I include your portentous leading article of Nov 25

2 It is doubtful whether in fact this relatively trivial sum will be saved If patients are there to be treated, something must be done about their needs The memorandum envisages the employment of suitably qualified general practitioners on a part-time basis These men will need payment on a scale commensurate with their loss of practice, and part-time work is in any event expensive Furthermore, I do not believe that as a rule, general practitioners can be efficient "sessional specialists, any more than I believe that the displaced senior registrars will be efficient general practitioners It is therefore possible that in the end there may be no financial saving whatever, or, if there is, it will be more than outweighed by increased disability and loss of working time in the productive population, due to unsatisfactory hospital treatment

3 The acceptance of such a policy as this is likely to be followed by a complete disruption of the hospital services, because, to put it vulgarly, the supply of mugs will dry up Dismissing ex Servicemen like myself as paranoid malcontents and looking only to the future I see that the medical student of today is unlikely to qualify until he is at least 24 A year's compulsory house jobs two years in the Forces a year, now, as senior house officer —and he is 28 He is then expected to embark on an uncertain series of yearly appointments from any of which he may be sacked and from one of which (the registrar/senior registrar transition) he certainly will be sacked His monetary and geographical future will not be sufficiently certain for any kind gentlemen to lend him money to buy a house and if he has children he will be evicted from his lodgings

At the end of this fool's progress during which he will have been too busy to learn his job properly he will if he is fortunate start to earn rather less—or even much less—than the general practitioner round the corner and as the hospitals will remain understaffed, he will continue to work himself to death If he fails at any point in his progression he will start all over again making a gallant assault although by now partly disabled on general practice—where openings are few or perhaps I should say well-defended

Nobody but a moron would undertake this career of specialisation My betters tell me that struggle was the rule before the late war But if there was cut throat competition at least one could choose one's own weapons Now the fight is under handicaps imposed from above and the general gladiatorial effect is enhanced by the periodic appearance in the arena of mad Ministry bulls (the Papal pun is nearly unintentional)

To sum up, the present Ministerial policy appears to be Unnecessary and expensive treatment is immediately provided, necessary and cheap treatment we cannot afford" Like you, I find much to admire in the National Health Service, but if policies like this

are accepted by the leaders of the profession, the whole edifice is likely to collapse

Permit me to add one personal point I do not write from any sense of individual grievance, for I am likely to be one of the lucky ones As, however, I am superstitious, I beg your permission to sign myself

ANOTHER SENIOR REGISTRAR

SIR,—It seems to me that there is a logical fallacy in the Ministry of Health circular R H B (50) 106 from which all the trouble springs A registrar or senior registrar is not only a trainee or student but also a working doctor essential to the National Health Service, and because a trainee has to leave the training ladder it does not follow that a doctor (the same man) has to leave the kind of work and position for which he has so far been found adequate

London, S W 19 E A BURKITT

SIR,—The three aspects of the matter are now clearly defined

1 The personal problem of the registrars and their families This is unlikely to affect the issue The registrars are not sufficiently numerous to form an effective pressure group, and appeals on compassionate grounds cannot be expected to have much effect

2 The adverse effect on medical education The universities and medical schools have probably sufficient margin to overcome this by improvements in their administration

3 The lowering of standards of care for the sick This is a very different matter and one on which the general public may be expected to have something to say

The general structure of the hospital side of the National Health Service has now taken definite form, and its authors must be prepared to meet criticism

There is nothing which falls so dead in the medical press as an attempt to start a discussion on principles of administration The subject arouses no interest, and it is perhaps not surprising that it is difficult to detect any coherent body of principles in the hospital organisation that has now been established One plausible explanation is that the Minister adopted the plan that Mr Wilfred Pickles found so successful for producing a good show—"Give them the money, Barney" Effective control of the money and everything else was handed over to the teaching hospital consultants, and all things considered it is a wonder the show is not worse (It was Lord Clive who exclaimed "By heavens, I stand astonished at my own moderation!") With the distribution of the secret merit awards, even the jack pot is empty and the money has come to an end This would seem an appropriate moment to consider if it was well spent From the imminent breakdown in the service this seems to be in serious doubt

From the outset it has been assumed that an efficient consultant service could be provided by engaging consultants for a certain number of sessions per week The fallacy of this assumption has been obscured by the fact that extremely competent registrars have been giving the 24-hour day and 7 day week service that the public needs If the registrars are to be greatly reduced in number some alternative must be provided The proposal in the circular that they could be replaced by part time clinical assistants is quite out of touch with reality

The best suggestion is that a grade of assistant consultants should be established Many of the senior registrars are well fitted to occupy such positions This grade would not carry the objections which apply to the grade of senior hospital medical officer The only serious objection would seem to be financial, and it is this consideration which gives pertinence to the question Has the money been well spent?

Walton Hospital Liverpool HENRY H MACWILLIAM

Parliament

How Many Registrars?

IN the House of Commons on Nov 22 Dr CHARLES HILL pointed out that the hospital and consultant service was provided by three groups of doctors—the specialist at one end, the junior house officers at the other, and in between the registrars who were training to become specialists There were some 5200 specialists in this country In the two senior groups of registrars there were some 2800 doctors at one or another level of the uncertain ladder of specialist status

It had been decided reasonably, as Dr Hill agreed, that the number of registrars should be regulated by the probable number of vacancies in the specialist ranks, and it had been calculated, partly on the basis of the age of existing specialists, that 150 vacancies would arise each year for the next few years This figure allowed for 30 additional specialist appointments When the National Health Service started it was hoped that there would be available in all parts of the country a comprehensive specialist service A modest beginning had been made. That the calculated annual increase in the number of specialists should be only 30 seemed to Dr Hill tragic. To fit this policy of a tiny annual increase in the specialist establishment, 1100 of the 2800 doctors now training to be specialists were to be swept out of the registrar ranks It was sound policy to adapt the number of specialist training posts to the prospect of promotion, but what was happening now, no doubt for financial reasons, was a freezing of the specialist establishment at the present level, apart from this modest increase

Under a circular sent out to all regional boards and boards of governors three quarters of the senior registrars would have to go as soon as possible after Jan 1, and also two thirds of the intermediate group Under special circumstances some senior registrars could be kept on, but in general they would have to go This was largely due, Dr Hill suggested, to the timid attitude adopted to the future expansion of the consultant services Moreover the registrars were not only under training for consultant status, they were also doing an important part of the work of the hospital The Ministry's circular suggested that the gap which their departure made should be filled by general practitioners on a part-time basis. Dr Hill said he would be the last to suggest that the general practitioner had not an important place in a hospital—indeed he thought that the G P's position should be stronger But to suggest that on a part-time basis the G P could do the work of the senior registrars was sheer nonsense

The registrar ranks had been swollen since the war in the belief, fostered by the Government, that there would be an expansion of the consultant service Many registrars were men of 32 to 35 who had served in the Forces during the war They had been training for specialist status ever since But he did not want to put the case only on a personal basis If the implied undertaking that there would be a consultant service everywhere was to be carried out, then an increase of establishment of 30 consultants a year was insignificant The Ministry had calculated that the country needed 7500 whole time specialists, yet there were only 5200, most of whom were part-time Dr Hill believed this timid attitude, combined with unwisdom in the mode of applying this policy, was not only dangerous to future hospital policy but would be damaging to the hospitals of the country from the early part of next year

Although Dr Hill informed the House that he had given the Minister notice at 2 30 P M that day that he was going to raise this matter on the adjournment motion no representative of the Government was present and no official reply was given

Nurses in Sanatoria

In the House of Commons on Nov 23, Mr R J MELLISH, calling attention to the shortage of nurses in tuberculosis sanatoria, said that in the 15 sanatoria administered by the South Eastern Regional Hospital Board, of which he was a member, 521 beds were empty through lack of staff Yet in this region men had to

wait on an average five months to enter hospital, and women from ten to twelve months. In the whole region, which catered for over 3,000,000 people, 24,000 were receiving tuberculosis treatment and 208 died last year

One of Mr Mellish's objects in raising the matter was to try to remove the fear of infection which he believed was militating against the recruitment of staff In response to the Minister's request the Bermondsey general hospital was anxious to open a ward for tuberculous patients, but though they had tried for three months to get a qualified tuberculosis sister they had failed He urged that the General Nursing Council should insist that all student nurses should have 3 months' experience in a sanatorium as part of their training The pay of tuberculosis nurses should be higher than the ordinary scale If a proper appeal was made Mr Mellish felt confident that many more part-time helpers would come forward A guarantee could be given that the danger of infection was remote

Mr J E POWELL believed that the figures on the waiting lists were underestimated because doctors hesitated to add cases to the waiting lists owing to the delay in admission He thought that they should go even further than the imposition of 3 months in a sanatorium as part of a nurse's general training A nurse who had served a year in children's, fever, or mental nursing could offset that period against the length of her general training That did not apply to service in a sanatorium and this was a deterrent to a nurse taking part of her training in such institutions

Mr ANTHONY GREENWOOD said that adequate housing accommodation, especially for male nurses, was needed He also deplored the lower status of tuberculosis nursing As practical remedies he suggested that sputum mugs should be replaced by destructible cartons, that nurses should be freed from the duty of counting soiled bed-linen and clothing, that there should be facilities in all wards for boiling crockery and cutlery, that electrical appliances should be provided for cleaning wards

Mr A BLENKINSOP, parliamentary secretary to the Ministry of Health, said that when the National Health Service was introduced there were just over 4000 full-time and slightly more than 600 part-time nursing staff in sanatoria and tuberculosis nursing hospitals At June 30 this year the number had increased to some 5300 full time and 1000 part-time nursing staff This improvement had led to an increase of staffed beds from 21,800 in 1948 to 23,300 at present There were still 4400 unstaffed beds and 2900 more nurses were needed One of the most potent factors in restricting the effectiveness of the campaign for more nurses had been the fear of infection, but the position had improved during the past year thanks largely to the advance of medical knowledge and the use of B C G vaccine, which was being made generally available for sanatoria and general hospital staffs, as well as in the domiciliary fields Whitley councils had already agreed on improved scales of general pay for tuberculosis nurses The Ministry were working out with the teaching hospitals plans for secondment of nurses from teaching and other hospitals to sanatoria These arrangements would be on a voluntary basis, but they would be encouraged by the Ministry with the full support of the General Nursing Council on the basis of proposals carefully worked out by the tuberculosis subcommittee of the Central Health Advisory Council The Ministry were anxious to secure the greatest possible accommodation for tuberculous patients in general hospitals provided that proper precautions could be taken against contacts That meant either separate blocks, or at least separate ward accommodation

Treatment of Tuberculosis

On Nov 24 in the House of Commons Mr G WILLIAMS pointed out that there were on an average 400 deaths every week from tuberculosis Some people were dying without treatment, and others received treatment so late that there was little hope of recovery Yet there were plenty of beds available abroad Before the National Health Service was introduced local authorities were able to send patients abroad, paying half the cost At present the Dutch were sending patients to Switzerland and other places We had 11,000 people waiting for treatment and yet no advantage was taken of foreign sanatoria He estimated that we could send patients to Switzerland for treatment for £13 15s a week, exclusive of pocket-money In Switzerland 1435 beds were available, and if there was difficulty in providing Swiss currency, France and Scandinavia offered alternative places for treatment While the beds were available in these countries Mr Williams thought it was wicked not to use them.

Mr BLENKINSOP said the Ministry were reviewing the provision of facilities for treatment of tuberculous patients in Switzerland, but all the information the Ministry had from Switzerland suggested that the contribution that country could make was much smaller than the figure Mr Williams had mentioned Medical opinion varied about the value of treatment in Switzerland for particular types of this disease The death-rate from tuberculosis had fallen from 23,550 in 1947 to 21,983 in 1948, and 19,834 in 1949 The figures for this year showed a continuation of this encouraging trend Even though accommodation was short and the waiting-lists long, it was right to go on with mass radiography diagnosis in order to know where the disease was Even in the home a great deal could be done to limit its spread The Ministry were considering the administrative organisation of the health service in relation to some of these problems, both in tuberculous and other special fields Their minds were by no means closed to any changes that might be necessary to secure more effective coöperation between all the agencies concerned

QUESTION TIME

Merit Awards

Mr BEVAN informed Colonel M. Stoddart Scott that the Merit Awards Committee had so far recommended 1504 consultants for awards It was not intended to publish a list

Hospital Committees and Trade-union Membership

Sir WALDRON SMITHERS asked the Minister if the two circulars, no 13 and no 20, issued by the Whitley Councils, had received his approval, especially paragraph 3 (b) of circular no 20, which provided that members of a hospital consultative committee should also be members of a trade union —Mr A BEVAN replied Yes, Sir The proviso refers to members of a nationally recognised negotiating body The application of the proviso is suspended for the present

School Dental Service

In answer to a question Mr GEORGE TOMLINSON Minister of Education said the number of dentists employed in the School Dental Service at the beginning of June was equivalent to 734 full time officers For a complete service of dental inspection and treatment in which every child was seen annually and all children who required treatment received it, he estimated that a ratio of about 1 dentist to 3000 children would be needed An additional 1150 dentists would have been needed last June to give such a ratio Owing to the general shortage of dentists however, it would be impracticable to achieve this for many years His immediate aim was to get the service back to its 1948 level, when it was able to offer effective preventive treatment For this purpose some 200 additional school dentists would be needed in England and Wales He hoped that progress could be made in filling the deficiency as a consequence of the meeting of the Dental Whitley Council

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis during the week ended Nov 18 were paralytic 110 (161) non paralytic 39 (64), total 149 (225) The figures for the previous week, compared with which there was a total decrease of 76, are in parentheses Uncorrected notifications for the corresponding week in 1947 and 1949 totalled 201 and 229

Total uncorrected notifications for 1950 up to and including the week under review are 8121 The corresponding figures for 1947, 1948, and 1949 are 8076, 2165, and 6134

Obituary

JAMES ALEXANDER MURRAY

M D , B SC EDIN , F R S

Dr J A Murray, one of the pioneers of experimental cancer research and a former director of the Imperial Cancer Research Fund, died at Hove on Nov 20

James Alexander Murray, the youngest son of W Murray, of Cramond, Midlothian, was born in 1873 He was educated at George Heriot's College and at Edinburgh University Before reading medicine he took his B SC degree, and later he worked in Germany with the eminent cytologist Boveri Having qualified in medicine in 1899, he was awarded the gold medal for his M D thesis in 1907 Meanwhile he had spent some time as medical officer in a mental hospital and as a locum tenens in general practice in Lancashire In 1903 he was appointed assistant to Bashford on the staff of the recently formed Imperial Cancer Research Fund, with which he remained until his retirement in 1935 In 1915 he was appointed director in succession to Bashford He was elected F R S in 1925

[Stoneman

Murray's earliest papers were on cytological subjects, but his best work was done in experimental cancer research When he joined Bashford, Jensen in Denmark had lately shown that the transplantation of tumours in laboratory animals was a practicable and promising method of cancer research Bashford and Murray followed up this lead with energy and success Already in 1905 in the second Scientific Report of the fund they had laid the foundations for the series of classical papers which, during the next few years, established the world-wide reputation of the laboratory as an outstanding centre of experimental cancer research The staff was greatly increased and much of Murray's work was published jointly with his colleagues, but his personal contribution was large and important He was a dexterous experimenter and an expert histologist It was due in great measure to him that experimental cancer research in this country from the first developed on a foundation of sound pathology He contributed to the massive third report (of 1908) important papers on the zoological distribution of cancer and on spontaneous and transplanted tumours of mice Many of his observations remain unsurpassed and those early papers still repay close study His paper, published in 1911, on Cancerous Ancestry and the Incidence of Cancer in Mice provided the first demonstration of a hereditary factor in the ætiology of mammary cancer in mice

By 1914 transplantable tumours had been fully exploited and their limitations were well known to Murray After the interruption due to the war of 1914–18, he turned his attention to the induction of tumours by tar, and he was among the first to show by careful clinical and pathological investigations that the new method was applicable to mice and that the resulting growths were malignant tumours Though Murray continued to study tar tumours his papers became less frequent His influence on cancer research, however, remained strong and wholly salutary He was widely known as a distinguished investigator of unquestioned skill and integrity, his command of German, French, and, to a less extent, Italian helped to extend his influence and reputation abroad At home he attended meetings diligently and felt it his duty to contribute to discussions and to criticise what he believed to be unsound "Murray's criticisms," a colleague writes, "based on wide knowledge and experience, were shrewd, penetrating, and always sincere Though latterly he might be accused with some justice of over caution, his conservatism was often justified and sprang from a deep sense of responsibility He maintained a remarkably high standard of integrity in both private and professional life and could neither understand nor suffer gladly those whose standards were less exacting He took few pains to disguise his contempt for pretentiousness and hypocrisy, he was often brusque with the eminent and flippant with the pompous Some pathologists who ventured a firm opinion on a specimen he showed at a meeting 'for diagnosis' were not over pleased to learn that it was a stained section of haggis As often as not the puckish wit was turned against himself

"Towards his subordinates he was kindly, unselfish and generous to a fault

"Murray was a man with strong opinions and many amiable foibles Under the self conferred title of The Woolworth Engineering Company he delighted to make apparatus at negligible cost out of tobacco tins, plasticine bent pins, and the like Some of the products were surprisingly useful, but his fireside microscope, for use in an easy chair, never reached the production lines Whatever the subject of conversation Murray was apt to interpolate some wholly unexpected information from his remarkable memory, for he had read and travelled widely In his prime he was a keen and successful golfer being at one time captain of the Sandy Lodge club His early interest in zoology and cytology persisted, and he relaxed happily in the study of pond water, about which he knew a good deal He took particular pleasure in association with amateur and professional microscopists at the Royal Microscopical Society, of which he was twice president In 1949, at the last scientific meeting he attended, the society conferred on him its highest distinction, the honorary fellowship

"Murray earned the respect and affection of all who knew him well, they will remember the quality of his work and character and mourn a friend of many sided accomplishment and charm"

In 1927 Dr Murray married Miss Ethel Beere, who survives him There were no children of the marriage

GEORGE STUART GRAHAM-SMITH

M A , M D CAMB , F R S

Dr G S Graham Smith, reader emeritus in preventive medicine in the University of Cambridge, died at his home in Cambridge on Aug 30, at the age of 75 [1]

He was educated at Clifton College, at Pembroke College, Cambridge, and at Guy's Hospital He was captain of the Pembroke cricket XI and was given a university trial as wicket-keeper, and at Guy's he played cricket for the hospital He was also a successful golfer and spent much time bicycling when bicycling was new

In 1901, after qualifying, he returned to Cambridge "wishing to learn a little more about pathology which, with kindred subjects, appealed to him more than practice" In the department of pathology he worked with Dr L Cobbett, Prof Sims Woodhead, and Dr G H F Nuttall. Nuttall, who had arrived in Cambridge two years before to teach bacteriology, founded the *Journal of Hygiene* in the same year, 1901 These three men won Graham Smith's lasting regard and loyalty His account of Nuttall and the department during the first two exciting decades of the century (published in the *Journal of Hygiene* in 1938) helps the reader of today to realise the intense vitality of these men and their period

In 1902 Graham Smith was appointed bacteriologist to the Cambridge borough council and demonstrator in clinical pathology at Addenbrooke's Hospital In

1 In his will Dr Graham Smith directed that no detailed obituary notice should be published because so few with whom he was intimately associated during his more active period now survive After discussion and due reflection it has nevertheless seemed proper Dr Graham Smith's wish having been made known to publish this account for many who knew him as a pioneer in bacteriology and hygiene will wish to see it

1904 he became John Lucas Walker student, and he graduated M.D in 1905 In 1902 he and Cobbett published a paper on an outbreak of diphtheria which they had studied in Colchester in 1901 Interest in diphtheria was very keen at that time, when both bacteriological diagnosis and antitoxin treatment were new, and in 1907 Nuttall and Graham-Smith published their substantial book on *The Bacteriology of Diphtheria*, nearly half of which Graham-Smith wrote Collaboration with Nuttall seems to have determined the main direction of his research. In 1904, Nuttall published his classical *Blood Immunity and Blood Relationship*, in which Graham Smith contributed the section on lower vertebrata and arthropoda and on the medicolegal use of the precipitin test in identification of blood

In all Graham-Smith published more than 60 scientific papers Papers on flies and their relationship with disease were the most numerous next came protozoal diseases (he described a parasite *Grahamella* in the blood of moles in 1905) then general bacteriological topics including his investigations of the growth-curve and of the duration of spore-viability then diphtheria, animal diseases, and other miscellaneous topics His interest in flies was strong and abiding Most of his later laboratory research was devoted to the study of their structure and behaviour Flies amused him He would describe their habits with a sympathetic exactitude which was inimitably humorous In his last year or two he collected many passages relating to flies from the writings of poets ancient and modern and he derived special pleasure from an article entitled "From the Fly's Point of View," by Barry Pain

From 1905 onwards Graham-Smith continued to teach bacteriology and took part in university affairs As assessor to the regius professor of physic (1907–19) he was closely associated with Sir Clifford Allbutt In 1919 he was elected fellow of the Royal Society From 1919 to 1933 he was secretary to the faculty board of medicine A successor in that office writes 'He was one of the most useful members of the board because of his long association with it and his intimate knowledge of university procedure" Earlier he was secretary of the now long-forgotten subsyndicate for tropical medicine and hygiene Those who attended his bacteriology lectures for the Cambridge diploma in public health will remember the dry wit and keen interest of them He also taught bacteriology for part II of the natural sciences tripos in its early days, and for many years he continued to give a few special and memorable lectures on such topics as plague and cholera, and, of course, the fly as a vector of disease In 1923 he was appointed reader in preventive medicine and so remained until he reached the retiring age in 1940

In 1939 he became editor of the *Journal of Hygiene* His name first appeared on its cover in 1912, but unquestionably he had helped Nuttall with the journal almost from its start in 1901 His strong feeling of loyalty to Nuttall made him feel responsible for maintaining Nuttall's tradition and standard Those who contributed articles during Graham-Smith's editorship will agree that the words he wrote of Nuttall apply equally well to himself He considered that an editor has an educational function in addition to his duty of assuring the regular appearance and high standard of his journal. In fact much of his time and energy was devoted to the correction and improvement of papers and to correspondence with contributors He advised and helped the young and inexperienced workers As editor he exerted great influence on workers scattered all over the world"

Perhaps Graham-Smith's most widely known memorial will prove to be the memorials he has left to the work of others The walls of the present department of pathology in Cambridge carry the pictorial record which he collected of the development of the Cambridge Medical School, with which he was so closely and for so long associated. During the last year of his life, while almost confined by ill-health to his house he worked hard on the compilation of a more detailed written record of the department and school, on a history of early entomology, on the collection of his anthology on flies, and on an account of the history of the *Journal of Hygiene* which will be published in the journal

Dr Graham-Smith enjoyed good stories, his own and other people's He could build a good story out of small everyday observations, and he found something amusing in practically any topic He set us a remarkable example of humility and of intense loyalty to his friends and teachers and to the principles of accuracy and veracity E T C S

CHRISTOPHER ROLLESTON

M.A., D M. OXFD, M.R C.P

Dr Christopher Rolleston's main work was done as medical officer of health in the small counties of Rutland and the Soke of Peterborough where he brought the health services to a high efficiency

Youngest of the three sons of the late Prof George Rolleston, F.R S each of whom in his own line left his mark on medicine, Christopher outlived his brothers Humphry Davy and John Davy by some years At New College, Oxford, he took second-class honours in the physiology finals in 1900, and he entered Charing Cross with a university scholarship After graduating M.B in 1903 he held house-appointments there and at the Prince of Wales's Hospital Tottenham, before he became an assistant medical officer under the old Metropolitan Asylums Board In 1909 he took his D.P H. and the following year the M.R C P In 1910 he was appointed M O H. for Rutland, and in 1914 he took up his appointment at Peterborough which he held until his retirement His special interest in tuberculosis, which was reflected in his published papers continued in his retirement, and only a few weeks ago he contributed a trenchant letter to our columns (Oct 21, p 486) in defence of the tuberculosis services of the public-health authorities

A fellow M O.H writes "Rolleston was a conspicuous member of the group of medical officers of health who pursued child welfare between the two great wars A man of decided views and a keen debater, he was the author of many reports which always excited interest and generally argument Apart from the interest he took in tuberculosis he will be remembered chiefly for the part he played in the great controversy over tonsils and adenoids, in which he took a middle line, arguing with great force against the excessive reduction of operations which followed Dr Glover's exposition of their abuse He belonged to the school which urged child welfare more from the pathological than from the physiological and social angles, but he could see all sides of the problems, and though inclined to be dogmatic, he was always logical He will be much missed by his colleagues by whom his erudition and force were greatly appreciated

Dr Rolleston died on Nov 19 at the age of 73

Births, Marriages, and Deaths

BIRTHS

CHALMERS—On Nov 18 at Inverness the wife of Mr J A Chalmers F R.C.S—a son

FINLAY—On Nov 24 at Sydney Australia the wife of Dr D M L Finlay—a daughter

KENWAY—On Nov 19 in Manchester the wife of Dr A. K Kenway—a daughter

KUROWSKI—On Nov 21 in Liverpool to Dr Elinor Kurowski wife of Dr A C Kurowski—a son

O'NEILL—On Nov 12 the wife of Dr Desmond O'Neill—a son.

SPRINGETT—On Nov 18 in London the wife of Dr V H Springett—a son

UNWIN—On Nov 22 the wife of Dr P Unwin—a son

MARRIAGES

KENDALL—BRODIE—On Nov 25 at Oswestry James Gordon Kendall M B to Jean Rhalaidr Brodie

DEATHS

BROADLEY—On Nov 23 in Sheffield John Broadley M B Lond F R.C.S E

ELLIOT—On Nov 18 at Fleet Hants Andrew Elliot M.A., M D Edin M.R.C.P D.P H.

JONES—On Nov 21 at Beaconsfield George Arthur Jones B A Oxfd L.S.A

MURRAY—On Nov 20 at Brighton James Alexander Murray M D Edin F.R.S aged 76

RUSSELL—On Nov 27 Henry Bret Russell M.D Lond., M.R.C P aged 55

SWAFFIELD—On Nov 19 in London Walter Henry Swaffield M.D Edin F R.C.S E

THOMSON—On Nov 26 in Belfast William Willis Dalziel Thomson K B. M D Belf F F C.P D.P.H.

Notes and News

R S M AND GENERAL PRACTICE

ON Nov 22 the section of general practice was inaugurated at the Royal Society of Medicine by Lord Webb Johnson, the society s president who welcomed the formation of the section as a notable step in narrowing the gap between general practice and the specialties He felt, too, that this section would help to maintain the general practitioner's interest in academic medicine—an interest which easily faded in the hurry of the day s work Dr G F Abercrombie, president of the section, remarked that an immense amount of medical knowledge was hidden away in the minds and the medical records of general practitioners The new section would enable all such doctors to transmit this knowledge, and he called on every general practitioner to ask himself if he had some contribution to make

CHEMOTHERAPY OF CANCER

AT a meeting of the Liverpool Medical Institution on Nov 16, the inaugural Florence Blair Bell lecture was delivered by Sir Stanford Cade, who declared that the main medical methods of controlling cancer, besides radioactive isotopes (which are more a biophysical than a biochemical means of affecting the rate of growth) fall into one of the following three groups (1) cytotoxic poisons, (2) hormones, and (3) vitamins Of the better known cytotoxic poisons, nitrogen mustard urethane, and the folic acid antagonists have been tried clinically in enough cases for their value to be assessed Nitrogen mustard is now used nearly exclusively in the terminal stages of Hodgkin s disease, in some cases of myelomatosis, and sporadically in other tumours such as cancer of the lung lymphosarcoma, and some highly malignant testicular tumours The mustards are, however, not an alternative to the better established methods of treatment, such as radiotherapy, but an additional weapon which is of value when the tumour no longer responds to radiotherapy

In Hodgkin's disease, nitrogen mustard prolongs life and leads to further, temporary, regression A compound, R48, prepared in the laboratories of the Chester Beatty Institute under the direction of Professor Alexander Haddow has proved of value against, among other tumours, malignant melanoma Urethane, whose introduction is due to the experimental work of Haddow and Sexton, has now been used for several years in chronic leukæmia and myelomatosis The folic-acid antagonist Aminopterin' may have an effect on the blood count even in acute leukæmia, its action, however, is chiefly that of a powerful leucotoxic agent and at present it is mainly a research weapon.

The control of prostatic cancer by œstrogens, and of breast cancer by both œstrogens and androgens, is of fundamental importance since these substances act principally on the host In a considerable proportion of cases which would previously have been untreatable, the tumour regresses, pathological fractures heal, fluid in the serous cavities is absorbed, and the patient is restored to near normal health and may live for an additional 2-5 years It is reasonable to presume that other hormones may also be of value, and already adrenocorticotropic hormone (A C T H) and Cortisone are used experimentally with some interesting effects Sir Stanford Cade also referred to a trial of vitamin B_{12} in various forms of cancer especially with metastases in the liver, in bone sarcoma and in cancer of the mouth

UNIT FOR PREMATURE BABIES

THE planning of the premature baby unit which was opened at University College Hospital on Oct 1 represents a move towards simplification of nursing technique in this field There are no cubicles (except for septic cases) or incubators, and there is no air conditioning

The unit, which can accommodate 12 babies consists of two nurseries (one warm and one at hospital temperature), a duty room an isolation room, a kitchen and a sluice The warm nursery is maintained at 75°F by thermostatically controlled electric panels and the humidity is kept at over 60% by a steam kettle Both temperature and humidity are constantly recorded on a Cambridge recorder—one of the many ways in which nursing duties have been reduced to a minimum The cots (made by Hoskins and Sewell) are rather larger than the usual type and are provided with close fitting glass tops which allow the oxygen content of the air inside to rise as high as 80% Bags for hot water bottles are slung along the cot walls and so do not interfere with nursing procedures

The babies are fed on breast milk provided by their mothers or from the hospital's own breast-milk bank, and an attempt is being made to simplify the preparation of the feeds—a very tedious task when performed under aseptic conditions. A modified Ekcomatic' pressure cooker has been acquired from Platers and Stampers Ltd, and it is proposed to prepare the feeds under ordinary clean conditions once a day, to fill the bottles, and then to sterilise the filled bottles in the pressure cooker If this experiment is as successful as preliminary bacteriological tests have suggested, much nurses' time will be saved

With the coöperation of the London ambulance service, a member of the staff of the unit will fetch a premature baby anywhere in the London area at any time a heated cot with oxygen supply is constantly ready for this purpose Outside the London area, the same service will be offered if an ambulance is sent to fetch the nurse on call Unfortunately the accommodation at the hospital is not sufficient to allow mothers to be taken in with their babies, but it is proposed to make arrangements for them to stay in the neighbourhood in suitable cases, so that they can feed their own babies

ROYAL DENTAL HOSPITAL

AT the 34th annual clinical At Home of this hospital, held last Saturday, clinical cases illustrating the work of the various departments were demonstrated throughout the day, and the orthodontic department had a display of some of the newer appliances for treating malocclusion

A colour film of a bilateral mandibular osteotomy, performed by Mr C Bowdler Henry some two years ago, was shown during the morning session The operation, which was for the correction of extreme prognathism, was done by the "closed' technique, and some recent photographs demonstrated the excellent cosmetic and functional result This film was an example of colour photography at its best and should be seen by all concerned with faciomaxillary surgery Later in the morning Dr A B MacGregor gave a talk entitled Facts and Fallacies, in which he expressed his views on controversial subjects including the ritual use of certain antiseptic drugs which are no longer employed in medicine and surgery His remarks on the relative inefficacy of tooth brushes in preventing dental caries were opposed to orthodox teaching, but served their avowed purpose of stimulating thought on matters that are often taken for granted The main event of the afternoon s programme was a brains trust, whose members were Mr N J Ainsworth, Mr B W Fickling, Mr J H. Hovell, and Mr H M Pickard, with Dr MacGregor as an able and witty question master The topics discussed ranged from the serious to the not-so serious—from the significance of rarefied areas of bone at the apices of teeth to the higher marriage rate among women with proclinated upper incisors, and from the correct name of an obscure oral lesion to the best hobby for a middle aged dental surgeon

The hospital has recently been granted an achievement of arms by the College of Heralds, and drawings were on view showing the evolution of the design, with its ingeniously selected charges indicative of the close relation between dentistry and medicine

WAR-HANDICAPPED CHILDREN

IN Europe alone, it is believed some 13 million children have lost their natural protectors In a new report[1] by UNESCO Dr Thérèse Brosse tries to give some picture of what such figures mean, and also to show what is now being done to help Though this is much it does not begin to be enough

Many of the children are refugees, and the International Refugee Organisation estimates that nearly 4000 are entitled to its care, but that less than half are getting it at present Many countries have their own colonies and schools for displaced or orphan children, while the Pestalozzi Village in Switzerland is a unique international school The children live with their own compatriots as families in the various houses sharing their games and out of school activities with children of other nationalities In many parts of Europe schools were destroyed or damaged and children are

1 War Handicapped Children Report on the European Situation. UNESCO 1950 Pp 142 3s

being taught in cramped dark quarters with no equipment, or are going without schooling Often fatigue, inattention, and forgetfulness at school are caused by poor living conditions at home Behaviour disorders are all too common, but generally disappear by degrees if the child can work and play in stable friendly surroundings

Many children were maimed during the war, and even as late as 1947 children were still being injured in Vienna—by exploding mines—at the rate of one a day Provision for maimed or disabled children varies in different countries, and is said to be particularly good at the Cité Joyeuse des Orphelins at Molenbeek in Belgium Emotional reablement is more difficult to achieve, especially when a child has been bandied about from place to place and has changed his language and even his nationality once or twice Such children either lose all self confidence or become aggressive, especially when children living with their parents outside a refugee camp look down on those from within the camp when they meet them at school The task of those looking after such deprived children is to give them the security which comes from ordinary family life Experience in every country has been that a child stands up well to danger provided he is in the company of a trusted adult But the sudden loss of the home and the ordinary ties, and above all the sudden death of the mother can injure the child gravely

The report calls for international coöperation in restoring these children, injured in so many different ways, to confidence and health.

AMERICAN ACADEMIC GRANTS

THE United States Educational Commission in the United Kingdom offer Fulbright travel grants to citizens of the United Kingdom and Colonies to go to America for an academic or educational purpose such as study, research, or lecturing Applicants must have a guarantee of financial support in dollars for their stay graduate students must show proof of admission to an American institution of higher learning and all applicants whatever their programme in America, must be definitely affiliated with such an institution. But applications may be made by candidates who have not yet concluded the above financial and institutional arrangements Graduate students must intend to spend an academic year of nine months in the United States, and professors lecturers, and senior research workers at least three months No exceptions to this condition will be made this year, and grants cannot be given for attendance at conferences alone These travel grants are available for travel to America between June 1 1951, and May 31 1952 they will cover the cost of return rail and steamship fares between the candidate s home in the United Kingdom or Colonies and the destination in America No allowances are made for dependants travel Further particulars may be had from the commission 55 Upper Brook Street, London, W 1

United States government grants—The United States government offers grants in dollars to assist faculty members at the university level, advanced scholars and research workers to visit the United States for the purposes of research or teaching in the year 1951–52 ' The fields in which applications will be accepted include science and technology Application for one of these grants which will be awarded for not less than six months and preferably for twelve months will also constitute application for a Fulbright travel grant Candidates must be British subjects resident in the United Kingdom and each applicant will be required to prepare a plan for study or a specific project which can be materially assisted by 6–12 months of research or teaching in the U S A Candidates will be expected to establish their own affiliation with an American university or research institution Application forms may be obtained from the United States Cultural Office Room 22 5, Grosvenor Square London, W 1 The closing date for applications is Jan 15 1951

MEDICAL FILMS

A LIST of films of interest to pathologists has been published (price 2*s* 6*d*) by the Scientific Film Association The association, which is preparing a new edition of its Catalogue of Medical Films, would welcome information on new films especially of the sort made for research purposes or intramural teaching if the authors wish them to be included in the catalogue Communications should be addressed to the hon secretary of the medical committee Scientific Film Association 4 Great Russell Street London, W C 1

University of Oxford

On Nov 18, the degree of D.M was conferred on D S Parsons

University of London

On Thursday, Dec 14, at 5 30 P M , at the Senate House, W C 1, Sir Stanton Hicks will deliver the Sanderson Wells lecture on Food and Folly

University of Witwatersrand

Dr Grantly Dick Read has been appointed an honorary lecturer in the department of philosophy

Society of Apothecaries of London

At a recent meeting of the court of assistants, over which Dr Frank Howitt the master, presided, A W Banks was clothed with the livery The following were admitted to the freedom of the society by redemption

H W Harvey P J Helliwell H P Winsbury White G H MacNab J B G Smith C A Keele L R Broster J A B Young T H Hills H F Turney F C Golding Sir Stewart Duke Elder A C Boyle A D C Bell H B S Warren H H Fouracre Barns C J S O Malley A J W Beard Lady Whitby A R H Hicks J H C Hill J H Hunt Selwyn Taylor R H Franklin, K A Latter E G Tuckwell, P A Tyser F R Bettley G R H Wrangham Ursula Shelley

The following were granted the diploma of L.M S S.A upon examination

C S Paul H Davidson P S McClure D J Müller

Princess Tsahai Memorial Hospital

Mr S W Allinson, F.R C S , has been appointed medical superintendent and first surgeon to this hospital in Addis Ababa, Ethiopia, Dr Edward Davison first physician, and Mr H C Fletcher-Jones F.R C S , second surgeon

Congress of Military Medicine

The 13th International Congress of Military Medicine and Pharmacy will be held in Paris from June 17 to 23 Further particulars may be had from the secretary general of the congress, Section Technique du Service de Santé 8 bis, Rue des Récollets, Paris X.

National Association for the Prevention of Tuberculosis

On March 16 and 17 a course for doctors will be held at 7 Drumsheugh Gardens, Edinburgh, 3, on B C G vaccine The speakers will include Prof Charles Cameron Dr W G. Clark Dr Agnes Macgregor Dr Ian Macgregor, Dr Marc Daniels, Dr I Mills Hall, and Dr K Neville Irvine The fee for the course is 3 guineas Further particulars may be had from the Scottish branch of the N A P T , 65 Castle Street, Edinburgh 2

Wireless Phototelegraphy Service

A doctor who wishes to have an urgent consultation with a colleague in another country can now telegraph a radiograph overseas through the Post Office—Cable and Wireless phototelegraphy service The charge depends on the size of the photo and also the country of destination It ranges from £1 10*s* for a small picture to Belgium or France to £15 for a large one to the United States Particulars can be obtained at any Cable and Wireless office the large post offices, or by telephone to London Temple Bar 1222, extension 282 and Monarch 8060 extension 305

Society of Medical Officers of Health

At the annual dinner of this society held in London on Nov 23 Dr J M. Gibson again spoke of the depressing effect of the National Health Service Act on those engaged in public health—the theme of his presidential address (see *Lancet* Oct 28 p 491) It was not surprising he said, if public health workers felt that they had had inadequate recognition from the public and from the authorities and if their reaction to the Act had been one of annoyance and despair Now however they were growing more hopeful the pendulum was swinging back He was replying to a speech by Dr E A Gregg chairman of the council of the British Medical Association who had referred to the close ties between the two bodies and had pledged the support of the B M A in the struggle of public health workers for fair treatment Sir John Charles and Sir Cecil Wakeley replied to the toast of The Guests amusingly proposed by Dr Hugh Paul Through changing times, Sir John said there always remained the fundamental concept of the medical officer of health as the adviser to his local authority and the watch dog of the community he served This was work worthy of a man

Notes and News

R S M AND GENERAL PRACTICE

On Nov 22 the section of general practice was inaugurated at the Royal Society of Medicine by Lord Webb-Johnson, the society s president who welcomed the formation of the section as a notable step in narrowing the gap between general practice and the specialties He felt too, that this section would help to maintain the general practitioner's interest in academic medicine—an interest which easily faded in the hurry of the day's work Dr G F Abercrombie, president of the section remarked that an immense amount of medical knowledge was hidden away in the minds and the medical records of general practitioners The new section would enable all such doctors to transmit this knowledge, and he called on every general practitioner to ask himself if he had some contribution to make

CHEMOTHERAPY OF CANCER

At a meeting of the Liverpool Medical Institution on Nov 16, the inaugural Florence Blair Bell lecture was delivered by Sir Stanford Cade, who declared that the main medical methods of controlling cancer, besides radioactive isotopes (which are more a biophysical than a biochemical means of affecting the rate of growth), fall into one of the following three groups (1) cytotoxic poisons, (2) hormones, and (3) vitamins Of the better known cytotoxic poisons, nitrogen mustard urethane, and the folic acid antagonists have been tried clinically in enough cases for their value to be assessed Nitrogen mustard is now used nearly exclusively in the terminal stages of Hodgkin's disease, in some cases of myelomatosis, and sporadically in other tumours such as cancer of the lung lymphosarcoma, and some highly malignant testicular tumours The mustards are, however, not an alternative to the better established methods of treatment, such as radiotherapy, but an additional weapon which is of value when the tumour no longer responds to radiotherapy

In Hodgkin's disease, nitrogen mustard prolongs life and leads to further, temporary, regression A compound, R48, prepared in the laboratories of the Chester Beatty Institute under the direction of Professor Alexander Haddow has proved of value against, among other tumours, malignant melanoma Urethane, whose introduction is due to the experimental work of Haddow and Sexton, has now been used for several years in chronic leukæmia and myelomatosis The folic acid antagonist Aminopterin' may have an effect on the blood count even in acute leukæmia, its action however, is chiefly that of a powerful leucotoxic agent, and at present it is mainly a research weapon

The control of prostatic cancer by œstrogens, and of breast cancer by both œstrogens and androgens, is of fundamental importance since these substances act principally on the host In a considerable proportion of cases which would previously have been untreatable, the tumour regresses, pathological fractures heal fluid in the serous cavities is absorbed, and the patient is restored to near normal health and may live for an additional 2–5 years It is reasonable to presume that other hormones may also be of value, and already adrenocorticotropic hormone (A C T H) and Cortisone' are used experimentally with some interesting effects Sir Stanford Cade also referred to a trial of vitamin B_1 in various forms of cancer especially with metastases in the liver, in bone sarcoma and in cancer of the mouth

UNIT FOR PREMATURE BABIES

The planning of the premature baby unit which was opened at University College Hospital on Oct 1 represents a move towards simplification of nursing technique in this field There are no cubicles (except for septic cases) or incubators, and there is no air conditioning

The unit which can accommodate 12 babies, consists of two nurseries (one warm and one at hospital temperature), a duty room an isolation room a kitchen and a sluice The warm nursery is maintained at 75°F by thermostatically controlled electric panels, and the humidity is kept at over 60% by a steam kettle Both temperature and humidity are constantly recorded on a Cambridge recorder—one of the many ways in which nursing duties have been reduced to a minimum The cots (made by Hoskins and Sewell) are rather larger than the usual type, and are provided with close fitting glass tops which allow the oxygen content of the air inside to rise as high as 80% Bags for hot water bottles are slung along the cot walls and so do not interfere with nursing procedures

The babies are fed on breast milk provided by their mothers or from the hospital's own breast milk bank, and an attempt is being made to simplify the preparation of the feeds—a very tedious task when performed under aseptic conditions A modified 'Ekcomatic' pressure cooker has been acquired from Platers and Stampers Ltd, and it is proposed to prepare the feeds under ordinary clean conditions once a day, to fill the bottles, and then to sterilise the filled bottles in the pressure cooker If this experiment is as successful as preliminary bacteriological tests have suggested, much nurses' time will be saved

With the cooperation of the London ambulance service, a member of the staff of the unit will fetch a premature baby anywhere in the London area at any time a heated cot with oxygen supply is constantly ready for this purpose Outside the London area, the same service will be offered if an ambulance is sent to fetch the nurse on call Unfortunately the accommodation at the hospital is not sufficient to allow mothers to be taken in with their babies, but it is proposed to make arrangements for them to stay in the neighbourhood in suitable cases, so that they can feed their own babies

ROYAL DENTAL HOSPITAL

At the 34th annual clinical At Home of this hospital, held last Saturday, clinical cases illustrating the work of the various departments were demonstrated throughout the day, and the orthodontic department had a display of some of the newer appliances for treating malocclusion

A colour film of a bilateral mandibular osteotomy, performed by Mr C Bowdler Henry some two years ago, was shown during the morning session The operation, which was for the correction of extreme prognathism, was done by the "closed" technique, and some recent photographs demonstrated the excellent cosmetic and functional result This film was an example of colour photography at its best and should be seen by all concerned with faciomaxillary surgery

Later in the morning Dr A B MacGregor gave a talk entitled Facts and Fallacies, in which he expressed his views on controversial subjects including the ritual use of certain antiseptic drugs which are no longer employed in medicine and surgery His remarks on the relative inefficacy of tooth brushes in preventing dental caries were opposed to orthodox teaching, but served their avowed purpose of stimulating thought on matters that are often taken for granted The main event of the afternoon's programme was a brains trust, whose members were Mr N J Ainsworth, Mr B W Fickling, Mr J H Hovell and Mr H M Pickard with Dr MacGregor as an able and witty question master The topics discussed ranged from the serious to the not so serious—from the significance of rarefied areas of bone at the apices of teeth to the higher marriage rate among women with prochinated upper incisors, and from the correct name of an obscure oral lesion to the best hobby for a middle aged dental surgeon

The hospital has recently been granted an achievement of arms by the College of Heralds, and drawings were on view showing the evolution of the design with its ingeniously selected charges indicative of the close relation between dentistry and medicine

WAR-HANDICAPPED CHILDREN

In Europe alone it is believed some 13 million children have lost their natural protectors In a new report[1] by Unesco Dr Therese Brosse tries to give some picture of what such figures mean, and also to show what is now being done to help Though this is much it does not begin to be enough

Many of the children are refugees, and the International Refugee Organisation estimates that nearly 4000 are entitled to its care, but that less than half are getting it at present Many countries have their own colonies and schools for displaced or orphan children, while the Pestalozzi Village in Switzerland is a unique international school The children live with their own compatriots as 'families" in the various houses, sharing their games and out of school activities with children of other nationalities In many parts of Europe schools were destroyed or damaged and children are

1 War Handicapped Children Report on the European Situation. Unesco 1950 Pp 142 3s

THE CHANGING FACE OF SURGERY*

SIR CECIL WAKELEY
K.B.E., C.B., D.Sc., F.R.C.S.
SENIOR SURGEON AND DIRECTOR OF SURGICAL STUDIES, KING'S COLLEGE HOSPITAL, LONDON; SURGEON TO THE ROYAL MASONIC HOSPITAL AND THE BELGRAVE HOSPITAL FOR CHILDREN; CONSULTING SURGEON TO THE WEST END HOSPITAL FOR NERVOUS DISEASES AND TO THE ROYAL NAVY

SURGERY as we know it may perhaps be termed a new profession, when compared with the profession of medicine by physicians. In the days of the ancients, operations of various kinds were performed, but in the early hundreds A.D., barbers, bathkeepers, mountebanks, and sow gelders were the people to whom the practice of surgery was entrusted. In their hands the art fell to a low level. In A.D. 529 St. Benedict founded at Monte Cassino a monastery which became famous once again in the second world war. Here a rebirth of surgery took place. But in A.D. 1210 William of Salicet wrote "A wise surgeon will refrain from stealing while he is actually in attendance on a patient." Even as late as this the profession of surgery could hardly be called a noble one.

Although in 1295 Lanfranc held that "no man could be a good physician who has not acquired a knowledge of operative surgery, a knowledge of both branches is essential," surgery was retarded by prejudice and tradition. Even such men as Galen remarked "Surgery is only a mode of treatment." It was Pope Innocent III who said "Ecclesia abhorrit a sanguine."

In A.D. 1368, by the appointment of master surgeons, a small guild of surgeons within the City of London was officially recognised. This was the earliest recognition of surgeons becoming distinct from both barbers and barbers exercising the faculty of surgery. The first Act regulating the practice of surgery in England was passed in A.D. 1441, but the struggle between the barbers and the surgeons went on until 1540 when the two guilds became incorporated as the Barber Surgeons.

There were really three factors which held back the progress of surgery.

One was the knowledge of anatomy or the lack of it. The student of today may well be appalled at the amount of anatomy which he is expected to learn, but the practice of surgery nowadays is dependent upon a detailed knowledge of anatomy. For many years any effort to obtain bodies for dissection was frowned upon by the Church, and as late as the 18th century it was only by illegal means that even the bodies of criminals were obtained for examination.

The second was the incidence of sepsis, which was always a sequel to surgical intervention, death very often following even minor procedures until the researches of Lister resulted in antiseptic surgery, which has now been modified to aseptic surgery.

The third factor was the lack of adequate anæsthesia. Until Lister with antiseptics and Simpson with anæsthesia removed the two last obstacles, the operations by which reputations of great surgeons were made, were more or less confined to amputations and cutting for stone. Both these operations were performed with great rapidity, surgeons disarticulating at the hip joint in under a minute and removing a stone from the bladder by lateral lithotomy in under thirty seconds.

In the latter half of the last century what we now understand by the art of surgery took shape. Surgeons were able to open the abdomen. As time went on and anæsthetics developed, the brain was explored, the chest opened, and the scope of operations increased.

With the widening field of surgery there has been associated a more detailed study of the basic subjects of anatomy, physiology, and pathology, and in the last thirty years surgery has undergone changes which are related to discoveries and developments in the ancillary subjects. The discovery of the sulphonamides in 1931 was followed by the discovery and clinical use of penicillin, and later of streptomycin and the other antibiotics now under clinical trial.

The physicists have developed X rays and radium, and radioactive elements are being used in the investigation and treatment of patients. The biochemists have played their part too. Intravenous therapy with blood, plasma, serum, saline, and glucose saline is of ever-increasing importance in extending the ever growing scope of surgery. The importance of water balance in the body has now been recognised.

In this country anæsthesia has established itself as a full specialty, and has been improved to such an extent that surgery which could not be practised twenty years ago is now performed as an everyday procedure. The old arrow poison, curare, which was used by primitive people to kill their enemies, is now used by anæsthetists with better motives.

With the increasing average age of the population and the greater longevity of the race, with the help of better anæsthetics, better supportive treatment, and the use of antibiotics, more old people are now undergoing major operations and surviving without becoming a burden to the rest of the population.

UNDERGRADUATE TEACHING

Before the days of Lister surgical lectures were practically the only form of instruction for the students. Today set surgical lectures are not popular nor are they necessary. In their place lecture-demonstrations have come into vogue. Bedside teaching and outpatient teaching are of the utmost service to the student. It is only by coming into personal contact with patients that students can acquire a satisfactory knowledge of surgical conditions. The actual palpation of a lump or tumour will register far more on the cerebral cortex of the student than a well-delivered lecture.

APPRENTICESHIP

In earlier days the student was apprenticed to a surgeon, and there was a great deal to be said for this form of learning. There was a personal touch about this way of acquiring clinical knowledge and the added interest of seeing patients in their homes and thus becoming initiated into problems which nowadays are only met with after qualification. It is to be hoped that when the new Medical Act comes into force, making a year's postgraduate experience compulsory prior to registration, the qualified student will be able to take part of his year's postgraduate training with a general practitioner.

Apprenticeship puts the student on his mettle because he must rely on his clinical acumen rather than on all the ancillary aids which are ready at hand in hospitals. There is a tendency today to overlook clinical observation and to rely too much on X rays and pathological or biochemical tests in making a diagnosis. I very much doubt if the clinician today has the clinical acumen of the late Victorian physicians, who made their diagnoses without the aid of tests and were often amazingly accurate.

PROFESSORIAL UNITS

After the first world war the surgical professorial units came into being and their number has been greatly increased since the second world war. There is a trend, however, for full-time professorial units to become too academic and to lose touch with patients and their diseases. There seems to be a tendency for teaching

* Opening address delivered at the Westminster Hospital Medical School on Oct. 2.

Memorial to Lord Rutherford

The Royal Society is proposing to establish lectures and scholarships in memory of Lord Rutherford Donations may be sent to the Rutherford Memorial Fund at the Royal Society, London, W 1

Pathological Films

Some films on pathology will be shown at a meeting of the medical committee of the Scientific Film Association at 1, Wimpole Street, London, W 1, on Dec 11, at 5 P M, when Prof Robert Cruickshank will be in the chair

Drugs and Spectacles

An appendix to the report of the Committee of Public Accounts shows that in the year ended March 31, 1950, payments under the National Health Service to 14,260 pharmacies in England and Wales amounted to just over £30 million—including £14 million for ingredients, £9½ million for dispensing fees, and £4½ million for "on cost" allowance This total represents slightly less than twelve months' earnings During the same period opticians received £4½ million for sight testing, and £17 million for the supply of spectacles

Potency of Streptomycin

Under the Therapeutic Substances Amendment Regulations, 1950, the tenth schedule to the Therapeutic Substances Regulations, 1931, is amended, from Dec 1, to require that streptomycin with a potency of less than 600 units per mg shall not be issued Hitherto the minimum potency has been 300 units per mg The requirement that a solution of streptomycin with a potency of less than 2000 units per ml shall not be issued has been deleted from the schedule, since this requirement is no longer necessary

Industrial Injuries Certification

New regulations which came into force on Nov 28 modify the rules for medical certification, and for claiming injury benefit under the Industrial Injuries Act A doctor may now give special intermediate certificates (the certificates used where incapacity has already lasted at least four weeks and is likely to be prolonged) at intervals of up to four weeks, even though he is seeing the patient more often Claims to benefit may be made and dealt with on the strength of these certificates, in advance of a further certificate confirming that the patient did in fact remain incapable of work throughout the period as forecast Similar arrangements have already been made for certification, under the National Insurance Act, for sickness benefit

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On Nov 15th, Sir James Learmonth was invested with the insignia of a chevalier of the Legion of Honour

The third volume prepared in connection with the 6th International Congress of Pædiatrics, held earlier this year in Zürich, is now complete The three volumes, which constitute the transactions of the congress, may be obtained from the general secretary s office International Pædiatric Association, Kinderspital, Zürich 32, for 25 Swiss francs, or 27 francs if bound together

Appointments

FITZGERALD P J L R C P I D P H asst county M O and M O H Willenhall Staffs

FLEMING, R A, O B E M S Durh F R C S E lecturer in anatomy Kitchener School of Medicine and asst surgeon Khartoum Hospital

HILL I M M S Lond F R C S consultant thoracic surgeon, Grove Park Hospital

PARSONAGE M J M B Manc M R C P D C H asst physician, department of neurology General Infirmary at Leeds and consulting neurologist to hospitals under the control of the Leeds regional hospital board

SUTCLIFFE MARY M A M B Camb D P H deputy divisional M O for south eastern division of Surrey

WHITTICK J W M B Edin director pathology department Royal Cancer Hospital London

Brook Hospital, London

Consultant Thoracic Surgeons

CLELAND, W P M B Adelaide M R C P, F R C S
MOORE B P M B Lond F R C S
SIDDONS A H M M CHIR Camb M R C P F R C S
WHITEHEAD L L B M Oxfd F R C S

Appointed Factory Doctors

ANDERSON G S M B Glasg Leslie district Fife
JAMIESON GEORGE M B Glasg Chryston district Lanark

Diary of the Week

DEC 3 TO 9

Monday, 4th

INSTITUTE OF OPHTHALMOLOGY Judd Street, W C 1
5 30 P M Mr J H Doggart Spontaneous Hyphema

INSTITUTE OF PSYCHIATRY Maudsley Hospital Denmark Hill S E 5
5 30 P M Dr K. Campbell Lecture demonstration

HUNTERIAN SOCIETY
8 30 P.M (Talbot Restaurant London Wall E C 2.) Dr Felix Brown Dr Wilfrid Sheldon Bad Habits in Children

SOCIETY OF APOTHECARIES Black Friars Lane, E C 4
3 30 P M Prof A W Wormall D.SC Theoretical Aspects of Isotopes in Relation to Medicine
5 P M Prof J S Mitchell Practical Aspects of Isotopes in Relation to Medicine

Tuesday, 5th

ROYAL COLLEGE OF PHYSICIANS Pall Mall East S W 1
5 P M Dr William Brockbank History of Some Therapeutic Procedures (First FitzPatrick lecture)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M (London School of Hygiene Keppel Street, W C 1) Prof Clifford Wilson High Blood pressure and Renal Disease

INSTITUTE OF DERMATOLOGY St John s Hospital, Lisle Street, W C 2
5 P M Dr I Muende Pigmentary Conditions of the Skin

SOCIETY OF APOTHECARIES
3 30 P M Prof E C Dodds F R S Biochemical Considerations of the Suprarenal Gland and its Relationship to Medical Therapy
5 1 M Dr W S C Copeman Use of Steroid Hormones in Rheumatoid Arthritis

Wednesday, 6th

UNIVERSITY COLLEGE Gower Street W C 1
5 30 P M Prof Bror Rexed (Stockholm) Cytoarchitectonic Organisation of the Spinal Cord

INSTITUTE OF DERMATOLOGY
5 P M Dr C W McKenny X ray Technique

SOCIETY OF APOTHECARIES
3 30 P M Prof E J King PH D Theoretical Aspects of the Investigation of Renal Disease
5 P M Prof Max Rosenheim Aspects of Treatment in Renal Disease

Thursday, 7th

ROYAL COLLEGE OF PHYSICIANS
5 P M Dr Brockbank History of Some Therapeutic Procedures (Last FitzPatrick lecture)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M Prof J McMichael Dynamics of Heart-failure

ST GEORGE S HOSPITAL MEDICAL SCHOOL Hyde Park Corner, S W 1
4 30 P M Sir Paul Mallinson Psychiatry lecture demonstration

INSTITUTE OF DERMATOLOGY
5 P M Dr A D Porter Hirsutism

INSTITUTE OF OPHTHALMOLOGY
5 30 P M Mr G G Penman Non inflammatory Lacrimal Obstruction

INSTITUTE OF PSYCHIATRY
3 P.M Dr G W Harris Neural Control of Pituitary Gland

BRITISH MEDICAL STUDENTS ASSOCIATION
5 30 P.M (London Hospital E 1) Dr A Peacock Travels and Experience in Australia

LONDON COUNTY MEDICAL SOCIETY
3 P M (New End Hospital Hampstead N W 3) Clinical meeting

SOCIETY OF APOTHECARIES
3 30 P.M Sir Horace Evans Medical Aspects of Peripheral Vascular Disease
5 P M Sir James Paterson Ross Surgery of Peripheral Arterial Disease

UNIVERSITY OF LIVERPOOL
5 P M (Arts Theatre of the University) Sir James Learmonth Portal Hypertension (William Mitchell Banks lecture)

NUFFIELD ORTHOPÆDIC CENTRE Wingfield Morris Orthopædic Hospital, Oxford
8 30 P M Dr L Guttmann Treatment of "Intractable Spasticity

HONYMAN GILLESPIE LECTURE
5 P M (Edinburgh University Anatomy Theatre) Prof Walter Mercer Osteo-arthritis of the Hip

Friday, 8th

KING S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill S E 5
4 30 P M Sir Thomas Fairbank The Spine (Legg lecture)

MAIDA VALE HOSPITAL MEDICAL SCHOOL Maida Vale W 9
5 P M Dr Anthony Feiling Clinical neurological demonstration

INSTITUTE OF OPHTHALMOLOGY
5 30 P M Dr H Davson Structure and Function of the Cornea

SOCIETY OF APOTHECARIES
3 30 P M and 5 P M Sir Henry Cohen Thyroid and Parathyroid Diseases

Saturday, 9th

KENT PÆDIATRIC SOCIETY
2 30 P M (Star Hotel Maidstone) Mr M B Shapiro Value of Intelligence Testing

THE CHANGING FACE OF SURGERY*

SIR CECIL WAKELEY
K.B.E C B D Sc, F.R C S
SENIOR SURGEON AND DIRECTOR OF SURGICAL STUDIES, KING S COLLEGE HOSPITAL, LONDON SURGEON TO THE ROYAL MASONIC HOSPITAL AND THE BELGRAVE HOSPITAL FOR CHILDREN CONSULTING SURGEON TO THE WEST END HOSPITAL FOR NERVOUS DISEASES AND TO THE ROYAL NAVY

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APPRENTICESHIP

In earlier days the student was apprenticed to a surgeon, and there was a great deal to be said for this form of learning There was a personal touch about this way of acquiring clinical knowledge and the added interest of seeing patients in their homes and thus becoming initiated into problems which nowadays are only met with after qualification It is to be hoped that when the new Medical Act comes into force, making a year's postgraduate experience compulsory prior to registration, the qualified student will be able to take part of his year s postgraduate training with a general practitioner

Apprenticeship puts the student on his mettle because he must rely on his clinical acumen rather than on all the ancillary aids which are ready at hand in hospitals There is a tendency today to overlook clinical observation and to rely too much on X rays and pathological or biochemical tests in making a diagnosis I very much doubt if the clinician today has the clinical acumen of the late Victorian physicians, who made their diagnoses without the aid of tests and were often amazingly accurate

PROFESSORIAL UNITS

After the first world war the surgical professorial units came into being and their number has been greatly increased since the second world war There is a trend, however, for full time professorial units to become too academic and to lose touch with patients and their diseases There seems to be a tendency for teaching

* Opening address delivered at the Westminster Hospital Medical School on Oct 2.

and attention to be directed to those whose sole object is to pick out a small aspect of surgery and beat it until it is dead, and to take teaching away from those who are practising surgery as a full time occupation, the very people who are continually in touch with patients and their diseases, and who are therefore perhaps the better able to teach because their knowledge is more practical and less academic

Whole time surgical professors are apt to spend the greater part of their day attending university meetings, and therefore they have less opportunity for actual teaching and operating than their part time colleagues

Part time professors of surgery have in the past century been pioneers, for it is from them that advance in the art and practice of surgery has sprung Such men as Lister, Fergusson, Macewen, Stiles, and Watson-Cheyne all held professorial surgical chairs, but they gave only half their time to these appointments They came into contact with the practitioner, did consultative practice, and were in constant contact with their professional colleagues To my mind any real advance in surgery will come from the part time men rather than the whole time surgical professor

SPECIALISATION

Specialisation in surgery is good up to a point, but there is a real danger of developing the ultra specialist who will only perform one type of operation Such a state of affairs is bad for teaching and makes for little progress There is a tendency to view a patient with ultra specialist eyes and only see a minute part of the anatomy instead of considering the patient as a whole How often has a special operative procedure been performed on a patient in whom a far more serious condition has been overlooked because a careful general examination has not been carried out

It is important that surgeons on the staff of teaching hospitals should remain general surgeons, but it does not matter if they have a hobby—for instance gastric surgery, thyroid surgery, or urological surgery General surgeons should have a sufficient variety of cases to give the students a general outlook which is essential It is, I think, agreed that there should be in teaching hospitals 5 beds per clinical student in general medicine and general surgery, but I wonder how often this obtains today

WAR AND SURGERY

There has always been a relationship between war and surgery Many of the famous surgeons of older times were military surgeons before they became well known in civil life

Progress in surgery occurs during great wars because the surgeon has such a wealth of material coming under observation and review The lessons learned in wars are often of great value in civilian practice, this is especially so with regard to traumatic lesions In this mechanical age the treatment of injuries to the body is of the utmost importance During wars surgical knowledge is pooled and made available to vast numbers of surgeons This was especially noticeable in the second world war when the War Wounds Committee of the Medical Research Council did a great service to the medical personnel of the fighting forces of Great Britain and America The use of blood transfusion, of penicillin, and of early evacuation by air were developments which will not be easily forgotten by medical men in the Services Every branch of surgery made progress during the last war, but perhaps the most outstanding advances were made in the treatment of nerve injury and the surgery of the heart and great blood vessels

EARLY AMBULATION

Today the patient is no longer allowed to become an invalid because he or she has had an operation Early ambulation has proved its worth both in the young and old and has lowered considerably the incidence of post operative thrombosis and embolism At the commencement of the present century elderly patients suffering from fracture of the femoral neck did not die from the injury but from pneumonia due to enforced rest in bed. Today early operation, early ambulation, and the use of penicillin have removed most major complications

Early ambulation has put a different complexion on the bad risk patient, for he benefits not only physically but also mentally The stimulating effect of early ambulation on an obese female patient following cholecystectomy has to be seen to be believed There is less likelihood of pulmonary collapse, inertia of the abdominal muscles, and circulatory failure, and there is in addition the desire to get well quickly The old fashioned procedure of 14 days in bed after an operation simply led to atrophy of the muscles, and distension of the intestines, with constipation and depression as a result

Modern physiotherapy goes hand in glove with early ambulation Before operation the patient is taught how to breathe properly and how to make use of the abdominal muscles This preoperative preparation has a very definite beneficial effect on the patient who will co operate after the operation and use his abdominal musculature and so reduce the incidence of complications.

THE PUBLIC AND THE PRESS

Before leaving the subject of postoperative after treatment it might be well to consider how much a patient should know

Although the public require to be educated in certain aspects of disease—especially in cancer—yet we must always remember that there is a danger of the press and the public knowing too much Moderation in all things should be the ideal Instruction in the early signs of cancer may be justifiable and important, but it would be a tragedy if we were responsible for creating a national cancer phobia among the population

When the mystery goes out of surgery the patient often loses much of his coöperative power and confidence in his full recovery Human beings are individuals and require treating as such Some will benefit from a description of the operation performed upon them, while such knowledge will transform others into nervous wrecks, the surgeon must decide how much knowledge is justified in each individual case

Confidence is the sheet anchor as far as the patient is concerned, once confidence is established he will cease to worry and the surgeon will have little difficulty in getting coöperation throughout any form of treatment that may be necessary.

SURGERY OF THE FUTURE

To those starting on a surgical career it may seem that operations go according to plan Extensive operative procedures are seen to cause a minimum of inconvenience to the patients, owing to blood transfusion, gastric suction, and the preoperative and postoperative use of vitamins and drugs such as vitamin K and heparin, yet you must remember that these are recent innovations in surgical treatment and rarely a year passes without the introduction of something new Surgery has by no means arrived at its zenith and further progress is not yet impossible—although it may well be that future research will eliminate some forms of surgical operations and that some diseases now treated surgically will be cured by intravenous drugs or other forms of treatment

Surgeons of the Westminster Hospital have played an important part in the world of surgery and have contributed their quota to the changing face of the profession of surgery To mention only a few, Walter Spencer, Rock Carling, Tudor Edwards, and Stanford Cade are men of whom you should all be proud

THE PATIENT AND HIS DISEASE *

A E CLARK-KENNEDY
M.D Camb, F.R C P
PHYSICIAN TO THE LONDON HOSPITAL AND DEAN OF THE MEDICAL SCHOOL FELLOW OF CORPUS CHRISTI COLLEGE, CAMBRIDGE

IN my first lecture I pointed out that the human body is the product of the plan laid at its conception and the environment in which it develops and is subsequently maintained I said that the brain permits the development of consciousness, and that consciousness permits the development of mind, which evolves under the stimulus of experience, the brain conditioning the process From that conception, I went on to review the risks to which human beings are exposed Faults in the genetic plan may interfere with the development of the body and through the brain with the evolution of the mind Adverse factors in environment may act on, and stimulate reactions by, the body, leading to pathological processes of the body which may interfere with its structure and functions, and if the brain is involved, with the structure and functions of the mind Adverse factors in environment may also affect the mind directly through the organs of special sense and the understanding, leading to pathological processes of the mind But it is an assumption to suppose that the human mind will ever be explained entirely in terms of the structure of the brain and the experience through which an individual passes All men feel free to run their bodies into danger or deliberately protect them from risk

Pathology of Body and Mind

Primary pathological processes of the body, if they affect the brain or any function of the body on which the brain depends, lead to abnormal reactions of the mind They can weaken the power of the will, alter behaviour, cause confusion of appreciation of events in space and time, and modify emotional feeling Primary pathological processes of the mind (which cannot exist apart from the body) may have a profound effect on the body In conversion hysteria subconscious wish fulfilment interferes with physical function through the skeleto motor nervous system In anxiety states repressed emotion interferes with physical function through the autonomic nervous system Thus far, disease might be comprehensible in terms of Cartesian or Platonic dualism A rider can normally control his horse, but a bad horse can gain control of its rider, and a bad rider can upset a perfect horse

Many clinical conditions, however, are not to be explained so simply They cannot be attributed to any known pathological process of the body interfering with the structure and functions of the brain on which the mind is based. Nor can they be attributed to any pathological process of the mind interfering with the structure and functions of the body They cannot in fact be explained in terms of a simple dualistic hypothesis of body and mind Both body and mind seem at fault or in some way peculiarly related Take for example, the functional psychoses to which I have already referred We are all liable to be depressed by unhappy circumstances, and physical disease modifies our emotional reactions to some extent, but in some people attacks of depression of mind associated with depression of physical health (which defies exact analysis) may occur again and again for no apparent reason and sometimes alternate with phases of excitement It is true that disorder of mind dominates the scene, but these attacks exhibit in many respects the features of physical disease Moreover, a family history of mental instability and an association with certain physical types both point, as I said, to a genetic peculiarity in the structure of the brain which, we must suppose, has so conditioned the development of the mind (to separate body and mind artificially in order to try to arrive at some concept which our own minds can grasp) that it is peculiarly liable to react emotionally to ordinary experience, while at the same time the development of the mind in this way has so conditioned the subsequent maintenance of the body that the mind is peculiarly liable to succumb through the body to physical disease In other words, we must invoke the psychosomatic concept of body and mind developing together, each reacting on, and reacting back on, the other, a view borne out by the tendency of cases of this kind to progressive mental deterioration suggesting further changes in the underlying brain as experience of life increases Do we not see the same kind of thing in epilepsy?—the genetic tendency to fits, and then the progressive deterioration of the mind under the stress of mental and physical experience

Similarly, every normal person tends to suffer to some extent from physical symptoms due to sympathetic stimulation when emotionally upset, and many are also liable to headaches or attacks of migraine or giddiness under similar circumstances But these changes are transitory and leave no structural consequences behind Some people, on the other hand, seem to be so constituted that emotional disturbance may precipitate thyrotoxicosis, leading to rapid loss of weight or so sensitise their bronchioles to peripheral stimulation that they start to suffer from asthma which may lead to heart failure eventually In others, emotional states are associated with increased irritability of the skin, predisposing to structural change, while the association of characteristic emotional mental states with simple ulceration of the stomach and duodenum and ulcerative colitis is probably significant We are driven to conclude, I think, that in these patients (in so far as our own minds can visualise psychosomatic development) the body has so conditioned the development of the mind, and the development of the mind has so conditioned the subsequent growth and maintenance of the body, that they are particularly liable to succumb physically to adverse physical factors or to emotional stimulation Structural changes now supervene which are not produced in more normal people unless physical factors act more strongly—thyrotoxicosis in acute infection, for example, and true allergic asthma Clinical experience, therefore, leads us to abandon our dualistic view of the body mind relationship, and compels us to conclude, as I have said already, that body and mind are different aspects of one underlying reality which like energy and matter, form and substance we cannot directly apprehend, our minds being so constituted that to us body and mind, like energy and matter, inevitably appear distinct

Further, does the mind play no part in the pathogenesis of diseases associated with typical structural changes which are generally regarded as of an organic nature, although we do not yet understand their causation? For instance, is it possible for an unwanted pregnancy to precipitate disseminated sclerosis or for a sudden shock to lead to cardiac infarction? Can a man die of a broken heart or be killed by business worries? Could the news of Austerlitz have killed Pitt? Again the association between emotional shock and organic disease seems too common sometimes to be attributed merely to chance, and there is certainly no theoretical reason why operations of the mind should not predispose the body to succumb to adverse physical factors in environment or even lead to structural change in it direct The transmission of impulses across synaptic junctions and the action of nerves at their endings are both due to the

* The second Croonian lecture for 1950 delivered before the Royal College of Physicians of London on May 11 The first was published on Dec 2

formation of chemical substances, and, the body being a chemical structure, chemical change, even to this extent, is fundamentally structural change Moreover, emotional and mental stress are both known to influence endocrine secretion, and endocrine secretion has a profound effect on structure and function Besides, if shock can turn a man's hair grey, why should it not lead to degenerative changes in his coronary arteries? But we must not expect regularity No two people have the same constitution, and constitution is basically physico chemical One man's body, it seems, is like a house built on the sand He is predisposed to succumb physically to mental stress if subjected to it on a sufficient scale Another man appears to be made of stronger stuff The rain descends, and the floods come, and the wind blows But his house falls not It is founded on a rock

The Nature of Disease

There is no absolute dividing line between health and disease Normality is only that which is most common Constitutional strength merges into average health, and average health through constitutional weakness into disease, the body being, as I have already pointed out, a balanced self regulating machine permitting consciousness, dominated by mind, and capable of adaptation to a greater or lesser extent to demand on function from within and change in environment without But there are limits to this process of adaptation Disease, as I see it, is that condition of a person in which action on his body, direct or through his mind (which can influence to some extent the structure and function of the body), or action on his mind, direct or through his brain (which conditions the development and reactions of the mind), stimulates reactions by his body and/or mind, and then these together lead to alteration of structure or disturbance of function with the result that eventually he starts to complain of symptoms or discovers signs in his body, or his friends notice an alteration in his appearance or complain of some change in his behaviour Nevertheless, even a definition of this length is far from "watertight," and I doubt that any definition could be framed which would satisfy everybody In brief, if you prefer it, disease is that condition of a man in which genetic faults, on adverse factors in environment, or both together, are interfering with the normal balance of the machinery of his body and/or mind on which his adaptation to environment depends

Ill health can therefore be understood to some extent, and usually understood sufficiently for practical purposes, in terms of its causes, which we can sometimes discover, and in terms of alteration of structure and disturbance of function, which we can often observe In some conditions, however, it is necessary to think in terms of the unseen chemical machinery which underlies all forms of structure and function, and for a more profound understanding of disease a synthesis of structural, functional, and chemical concepts is necessary, in the same way that a synthesis along similar lines is required for understanding the nature of man himself But it is doubtful if we can ever hope to understand disease completely even in chemical terms There can be no disease without a patient to suffer from it, in the same way that there can be no mind as ordinarily understood without a body to maintain it Every disease, we must admit, is an integral part of a man, the product of heredity and environment, in the same way that the man himself is the product of his heredity and his environment Diseases divorced from patients are abstractions from reality, the descriptions in the textbooks being compound pictures of a large number of similar observed reactions We do not understand the nature of a man, particularly the relationship which exists between his mind and his body Whence it follows that we cannot really understand the nature of his disease which is so essentially a part of him Therefore, although medicine must use science freely, it cannot ever be wholly scientific, as some would make it if they could It must always remain to a large extent empirical, compelled again and again to deal in a practical way with much which we do not understand Many would say that for this reason it must always to a large extent remain an art

Man has changed little down the ages It is his diseases which have altered with the passage of time, owing to variation in the micro organisms pathogenic to him, and the use which he has made of his mind to increase his knowledge and modify his environment Clearly diseases cannot be ready made entities which overtake us and which can be neatly classified and labelled as their Latin names suggest Rather, a little thought reveals that they must be reactions (outside the average which determine our ideas of normality) between a man's genetic origin (no two men have quite the same genetic origin) and his environment (no two men have quite the same experience) They also depend on the use which the individual makes of his mind, and at this level adverse physical factors may not act adversely (It is exceedingly doubtful if any man would flourish long in his particular Utopia) But there are no absolute dividing lines in this three dimensional continuum Excessive demand on normal function merges imperceptibly into constitutional disease, due to normal demand on function of a body or mind weak for little understood genetic or environmental reasons Constitutional disease merges imperceptibly in one direction into psychoneurotic disease due to adverse factors in environment interfering with the development of a mind based on a brain somatically weak, and in the other into organic disease due to adverse factors in environment interfering with the development or maintenance of a body somatically weak for genetic reasons Psychoneurotic disease and organic disease merge imperceptibly into psychosomatic disease in which the constitution of the patient is such that his body is predisposed to succumb to emotional stress or his mind to physical ill health Psychosomatic disease, as thus defined, merges into organic disease in which little understood genetic or acquired factors conspire to produce structural and functional abnormality Organic disease of this type merges into organic disease due to definite genetic defects or isolated adverse factors encountered by mischance in man's environment, or more often to some combination of genetic and environmental causes This conception may well be wide of the mark Nevertheless, it must be nearer the truth, I maintain, than the conception of diseases as distinct and isolated entities, necessary though that simplification must often be for practical purposes and for exchanging experience with one another

Certain diseases, however, stand out as fixed points in this continuum, like the main peaks in a mountain range These are the peculiarly characteristic reactions between man and his environment which we meet in practice occasionally and the more common reactions which we encounter almost every day, although it must be remembered that no two cases of what we call the same disease are ever really quite identical, because they are the reactions of two individuals constituted differently to a cause which is probably operating slightly differently in both cases In some, such as diabetes and endogenous depression, a particular disorder of function dominates the scene and gives a disease its name, structural changes being absent almost altogether, in others, such as carcinoma and the reticuloses, there is a characteristic alteration of structure, the functional disturbance produced not being particularly characteristic In a third type, characteristic structural change and typical

functional disturbance are both in evidence, as in rheumatic heart disease and hypertensive failure Thus many diseases, within the sense defined, can be recognised at sight, and appear to "breed" true to type like birds and beasts and flowers

Diagnosis

Sometimes, therefore, diagnosis is empirical, based on observation and experience, the pathological process and disorder of function from which a patient is suffering being obvious at sight Under these circumstances no conscious processes of thought are necessary, and, as experience increases, clinical pictures as a whole can often be recognised without thinking, entirely from experience At other times diagnosis is rational, based on reason, on the application of systematised knowledge and the accumulated experience of disease of different types to the clinical picture presented by the patient More often it is partly rational and partly empirical It depends on a combination of reason and experience

Every patient who comes complaining of symptoms must be suffering from some alteration of structure or disorder of function of his body or some disturbance of his mind. In one case it may be due to constitutional weakness but might equally well herald the beginning of organic disease In another a primary pathological process of his body may be interfering with the working of his normal mind or a psychoneurotic reaction of his mind interfering with the working of his normal body Clearly therefore the casual division of patients into organic and "functional" in hospital practice, where it is mainly a question of spotting the former and disclaiming responsibility for the latter, will not stand analysis, and it will not even work in general practice where these so called "functional" cases take up most of every doctor's time Under these circumstances diagnosis must be much more accurate than that, and consists so often, not in finding a label which will fit a patient into the book, but in forming a concept, one to which it is often hard to give a name, which must be carried in the mind Every sick man, I maintain, must be fitted for a practical purpose into his approximate place in our minds in the continuum of human disease which I have endeavoured to describe Therefore, some method of thinking is essential, and in a difficult case, so often the one in which the patient tends to dismiss his symptoms as unimportant, disorder of function and pathological process should be deliberately divorced What alteration of structure or disturbance of function is responsible for these symptoms and these signs (if any can be found to help)? What is the underlying pathological process responsible for their production in this particular person?

Some symptoms are clearly of a mental nature The patient complains of anxiety, depression, or inability to concentrate Others are subjective bodily feelings He complains of exaggeration or diminution of a sensation to which he is normally accustomed, or of a new and arresting sensation which he may never have experienced previously A third group of symptoms includes irregularities of normal function A fourth comprises structural changes which the patient has discovered for himself Symptoms of this kind are self discovered signs which can be confirmed on examination, when further signs are often found (The only true symptoms are subjective sensations which have no counterpart as signs, and the only true signs objective changes in the body which a man cannot well discover for himself, a distinction without any particular significance) But, as we all know, the interpretation of a symptom or sign in one patient may be entirely different from its interpretation in another, and the same symptom or sign may suggest failure of function in one patient and overaction of function in another In most cases, however, the interpretation of symptoms and signs in one direction makes better sense than their interpretation in any other, and suggests that the patient is suffering from failure or overaction of this or that function or that the structure of his body has become altered in this or that manner Moreover, if they are interpreted correctly it is usually possible to decide which are manifestations of some alteration of structure or disturbance of function due to the direct consequences of adverse action on his body, and which are alterations of structure and disturbances of function due to reactions by his body tending to conserve his life and promote his recovery When their interpretation fails to make anatomical or physiological sense, signs and symptoms must be a product of the mind

The nature of the underlying pathological processes, unless the history supplies the clue—social circumstances, for instance, a recent injury, a dangerous occupation, or exposure to infection—is often more difficult to ascertain (On the whole we know more about disturbances of function than about pathological processes) Moreover, the same disorder of function may be due to many different pathological processes with the result that accurate diagnosis of the functional disturbances in a patient does not necessarily help in the diagnosis of their underlying cause Nevertheless, certain guiding principles stand out, and, in order to complete the picture which I am endeavouring to paint, let me state them briefly

Symptoms which a patient refers to his mind can originate in mind or body, but, amnesia excepted, are seldom deliberately invented (Physical symptoms serve the malingerer better) Anxiety, inability to concentrate, and mental fatigue are usually psychoneurotic, severe emotional disorders psychotic Confusion and intellectual impairment are usually organic, delusions and hallucinations, when consciousness is clear, psychotic

Symptoms which a patient refers to his body can also originate either in his body or in his mind Fantastic symptoms—fantastic in the sense that they cannot be explained in terms of any known disturbance of function—must be invented by the mind, even pain must be hysterical when it lacks the features of true pain, and is probably hysterical, in part at least, if it is clearly serving the patient's purpose Possible symptoms—that is to say, symptoms capable of functional interpretation—when unrelated to demand on function are probably psychogenic, if of the visceral variety, due to anxiety stimulating overaction of the sympathetic, if of the somatic variety, due to the mind intervening subconsciously in the affairs of the body through the skeletomotor nervous system Physical symptoms related to functional demand which have remained unchanged for long periods, or supervened only with increased demand on function, are probably due to excessive demand on function weak for genetic or acquired reasons As we all know, it is the new symptom related to normal demand on function, in a patient who has never had any weakness in that direction previously, which suggests organic disease

But from time to time organic disease starts in the neurotic person, and then the interpretation of symptoms is particularly liable to go astray unless physical signs are discovered to keep the diagnosis straight For the absence of physical signs does not exclude organic disease, or their presence necessarily indicate that it exists All signs are not of equal significance Some can be due to excessive demand on normal function or emotion interfering with the functions of the body, *and* to organic disease Others cannot be produced either by emotion or excessive demand on normal function, and can only be due to conscious or subconscious intervention of the mind in the affairs of the body or to direct action on the body Distinction within this group is, however, seldom

difficult Signs which conform to anatomical fact and physiological law must be organic, signs which fail in this respect can only be explained in terms of processes of mind A third group can only be produced by a pathological process of the body, their nature ruling out all other possibilities A large heart must be due to dilatation, a consequence of organic disease, or to hypertrophy, a reaction to increased demand on function No emotional stimulation or subconscious intervention of the mind in the affairs of the body can paralyse a single muscle or diminish the entry of air into one lung Mind can influence structure, but the power of the mind does not extend as far as that Provided signs of this kind are certain, the patient must be suffering from organic disease even if his other signs are all of psychogenic origin Hence the pride of place of certain physical signs, and the importance, as we all know, of the routine examination of every patient

Nevertheless, even when no abnormal physical signs can be found, impressions gained from the history often add up with unexpected accuracy, to suggest that a patient's symptoms are due either to an excessive demand on normal function, to an organic pathological process interfering with his body or his mind, to a psychosomatic condition, or to a psychoneurotic reaction of his mind interfering with the functions of his normal body Moreover, when he is clearly suffering from some organic condition, the combination of functional disturbances and structural changes in relation to his age and the length of his history is often sufficiently characteristic to suggest that a congenital defect, malnutrition, injury, chemical poisoning, new growth, or the degenerative processes of advancing age (it is often worth while to go through the list systematically) is the cause of the symptoms of which he came complaining

A clinical diagnosis in this sense—a diagnosis based on the history, in so far as it can be obtained, and a physical examination, carried out as completely as circumstances permit—that is to say, a diagnosis on the evidence immediately available, is, I would have thought, necessary in every single case Whether an X ray examination or laboratory tests are required to confirm or extend it, or exclude some dangerous although less likely condition, is often a very difficult decision, and must depend, it seems to me, on an assessment of the chance of being right on clinical evidence alone, and on the chance of any condition from which the patient might be suffering being amenable to treatment In fact it depends on an estimate of probability

Initial diagnosis, on which so much depends, therefore can seldom be scientifically exact (as administrators of medicine sometimes forget), and for this reason there is a natural tendency today to make more and more use of the many investigations which can now be called upon to help in the diagnosis of a difficult, or paint the picture more completely of an interesting, case Moreover, these are steadily increasing in number and complexity, and we can now shelter behind them in almost every case if we feel disposed, particularly as patients are increasingly tending to demand them themselves instead of relying on our clinical judgment But we cannot afford to be too extravagant and a halt in their use sometimes must be called One thing is certain Clinical diagnosis should always go before and laboratory investigations follow after (In the midst there must often be much hard thinking) If the order of the procession is reversed investigations tend to pile up and the management of a case may go seriously astray Besides, we must be prepared to take some risk, after exercising all reasonable care, and even refuse investigations sometimes when they are demanded by patients, or practical medicine will soon become impracticable When a patient is clearly beyond human help an accurate diagnosis is likely to be quite irrelevant to treatment and, therefore, investigations correspondingly unnecessary Moreover, they should not be carried out merely as a shield against criticism, seldom ordered for our own interest alone, and except for research purposes seldom considered, particularly in old people, unless likely to yield results on which therapeutic action might be taken Only if we adopt a definite policy on these lines shall we keep their charge on recurrent expenditure from rising (leaving more money for capital development) and reduce the unnecessary discomfort which they cause and the unnecessary anxiety which they often engender in the minds of our more sensitive patients

The investigations sometimes necessary to confirm or supplement a clinical diagnosis are of four kinds Some reveal new subjective symptoms or create new objective signs The injection of cold water against the tympanic membrane leads to vertigo and nystagmus when the semicircular canals are functioning normally Others describe subjective sensations or objective signs with greater accuracy than ordinary demands on function, or the tests to which the patient subjects himself, readily permit For instance, vision is tested by reading Snellen types and hearing by sounding notes of different frequency with increasing intensity the perimeter maps out a defect in the visual fields, and the audiometer measures the reduction in his range of hearing which the patient had only vaguely noticed himself A third group extends the ordinary clinical examination of the patient by means of three of our senses, vision, touch, and hearing Inspection of the shadows cast by tissues in the path of electromagnetic radiation, and looking inside the body by means of tubes, mirrors, and lenses, do not differ fundamentally from the ordinary inspection of the patient The polygraph records the pulsation in the radial artery which the finger can, and that in the jugular vein which the finger cannot, detect and translates them into a permanent record An electrophonograph amplifies heart sounds A fourth group records changes in the physicochemical machinery of the body which are not directly reflected in the subjective sensations or objective signs, a knowledge of which is often necessary for the fuller understanding of disease Chemical analysis of the body fluids throws light on metabolic disorders Immunological technique studies antigen antibody structure which as yet defies analysis at the chemical level The string galvanometer records the electrical concomitants of physicochemical changes in the heart and nervous system

Treatment of the Patient

But there may be no time for investigations An acute disturbance of bodily function may dominate the situation and demand immediate action on a clinical diagnosis In another case an acute reaction of the mind has created a scene and order must be restored In a third case symptoms point to a functional disturbance trivial in itself but pointing in its turn to a pathological process rapidly heading towards disaster, and which must be immediately arrested More often symptoms point to some disturbance of function which must be relieved while investigations are in progress, or to a reaction of mind which cannot long be ignored, behind which lies some pathological process, which might perhaps have been prevented, and which cannot now be safely left to run its course These three aspects of treatment make up the art of healing

The functional balance of the body must be maintained, as far as possible Demand on failing function should be reduced, but vital functions must, like His Majesty's Government, be carried on at basic level The respiratory centre or the heart may demand stimulation with drugs, in a long illness enough food must be given to maintain nutrition, and in a short one enough fluid

to maintain hydration and ensure renal secretion When function fails altogether it can sometimes be operated artificially Thus the lungs can be ventilated mechanically, a skeletal muscle stimulated electrically, and endocrine function maintained chemically Substances lost from the body—corpuscles, plasma salt, water—can be restored Failing function can often also be relieved by plastic operations, as in the treatment of some congenital defects, transplantation of tendons in long standing paralysis, and fixation of joints in chronic arthritis In many cases the treatment of failure of a function coincides with the treatment of the pathological process Thus excision of the lens lets light into the eye, and removal of the prostate urine out of the bladder

On the other hand function out of proportion to the needs of the body must be curtailed The activity of a gland can be reduced by ligation of some of its vessels, removal of part of its substance, division of its nerve-supply, or the administration of drugs Alternatively its secretion can be neutralised chemically or countered pharmacologically Spasm of plain muscle can be relieved by stimulating sympathetic or inhibiting parasympathetic nerve endings Hyperpyrexia can be controlled by promoting evaporation, and an unproductive cough relieved by drugs which depress the respiratory centre The rapid division of cellular tissue can be inhibited by radiation Pain, irritation, and sleeplessness can be relieved by hypnosis and by drugs Pain can often be relieved without drugs if the mechanism of its production is understood, for instance, by minimising demand on function, preventing movement, reducing congestion, and relieving tension Severe pain can sometimes be relieved by blocking pathways in the nervous system, temporarily by means of drugs, permanently by their division with the knife and by the operation of leucotomy

Meanwhile the conscious reactions of the patient's mind can seldom be ignored Every patient reacts to the pain, discomfort, anxiety, and curtailment of his life which result from his disease Normal reactions demand sympathy and understanding, but the patient who reacts too little must be frightened into taking more, and the patient who reacts too much encouraged to take less, care of his physical health. Psychotherapy which the psychoneurotic reactions demand, depends on the influence which one mind can exert directly on another through the ordinary channels of communication between them, and demands a natural capacity for sympathetic understanding of another person's problems which can be bred out of existence by an unbalanced scientific training It relies mainly on persuasion, suggestion and reason, based on an appeal to self interest or, when self interest and social duty conflict, to accepted moral standards Psycho analysis goes further and attempts to unravel the past development of the individual mind in relation to emotional reactions to experience, which contribute to the development of personality, and release repressed emotion which is causing mental tension The patient is compelled to live through his emotional experience again, and learn the cause of his previous fears and obsessions so that he will be able to adapt himself more satisfactorily in the future to circumstances outside his control The reactions of the mind can also be modified through the physiology of the underlying brain Some drugs detach the mind from reality, others release inhibition Many depress the higher functions of the nervous system and can be used to rest the mind A few reduce reaction times raising the efficiency of the mind for a while a little above its average level, and are of some value in the treatment of depression

But psychotherapy may cut no ice Treatment of a functional disturbance of the body, attention to general health, or alteration of environment alone may be of little avail There may be no known pathological process active in the body Under these circumstances treatment must attempt to alter the psychosomatic constitution of the patient (which in some way has rendered his body liable to succumb more easily to emotional stimulation or his mind to physical ill health), and must be directed to mind and body simultaneously in proportion to the part which each is playing in the individual case, the intensity of treatment depending on the degree to which his personality has changed already or was at fault from the beginning True, human experience suggests that inward conviction may result in a revolution of human personality subsequently reflected in alteration of constitution of body, but dramatic changes of this type, however they are produced, transcend our ordinary methods of psychotherapy, and we are compelled either to resort to empirical treatments directed to the brain on which the mind is based, or to attempt to alter the endocrine pattern of the body on which the brain depends

Convulsions induced by chemical substances or by electrical stimulation of the motor cortex seem to be of some value in depression, and insulin hypoglycæmia to be of some use in schizophrenia Prefrontal leucotomy dissociates the emotional from the intellectual reactions of the mind, and will often reduce an agitated, depressed, or excited patient to a socially more manageable state, but usually at the expense of some deterioration in his personality The same operation, the results of which are always difficult to predict, is also said to abolish mental symptoms in severe anxiety states, although it often leaves the associated physical symptoms unchanged We must wait to see to what extent (if any) structural changes in the body, such as simple ulcer, and functional disturbances, such as high blood-pressure, will respond to personality change produced by operations on the brain

Alternatively we can attempt to alter the endocrine pattern of the body which is well known to have influence on the reactions of the mind Thyroid will certainly restore the intelligence in myxœdema, and some of the mental symptoms of thyrotoxicosis respond to thyroidectomy and thiouracil. The sex hormones are known to relieve the physical and mental symptoms associated with the constitutional change through which women pass at the menopause, and are of some value in restoring normal secondary sexual characteristics and normal instinctive reactions in people suffering from deficiency of the internal secretion of their reproductive glands, although they will not convert a homosexual into a heterosexual person or influence instinct appreciably when the endocrine system is normally balanced (Reactions of the latter kind are at a higher level of development of personality) But the recent discovery that an extract of the suprarenal cortex will relieve the symptoms of many of the rheumatic diseases, suggesting that some people are predisposed to succumb to adverse factors in environment by the peculiar endocrine balance of their body raises altogether new possibilities Further, the fact that 'Cortisone' may have a profound effect on the reactions of the normal mind suggests that we may acquire the power to relieve physical diseases of certain kinds by means of related substances, only at the expense sometimes of altering the patient's psychosomatic constitution in such a way that he reacts differently to experience in future On analogy with drugs, any change of personality produced is likely to be for the worse rather than for the better That is all that can be said I think, at present

Genetic disease could be prevented to some extent by the eugenic control of marriage if that was practicable, but the compulsory sterilisation of the genetically unfit would be unlikely to prove very effective, because of the pool of recessive genes latent in the general

population It is sometimes possible, however, to remedy a genetic defect as in a plastic operation for hereditary cleft palate or in splenectomy in familial acholuric jaundice A hæmolytic reaction in a newborn child can be treated by transfusion with Rh negative blood, but damage to the fixed tissues cannot be undone, and it is difficult to see how risks of this kind are to be prevented But it is possible to control to some extent the internal environment which the potential mother provides for her developing child and prevent some of the other diseases which can be acquired at birth during intra uterine development Every pregnant woman can be Wassermann tested, and should avoid the risk of infection, particularly virus infection, during the first three months of pregnancy Antenatal supervision ensures the diet which fœtal growth demands, reduces the risk of severe toxæmia, and anticipates obstetric complications

I can refer only very briefly, in order to complete my picture, to the prevention and treatment of disease due to pathological processes apparently acquired during life The risk of accidents and chemical poisoning can be reduced by legislation, and the prevention of mal nutrition is a problem of social administration and individual education Infective disease can be prevented to some extent, sometimes by reducing the risk of exposure to infection, as in tuberculosis, sometimes by raising natural resistance, as in inoculation against typhoid, sometimes by reinforcing the natural defences of the body, as in passive immunisation against diphtheria, and sometimes by maintaining a sufficient concentration of antibiotic in the blood, as in the prophylaxis of malaria Established infection can sometimes be over come by reinforcing the body with preformed antitoxin, but far more often far more successfully by so altering the internal environment of the patient with chemotherapeutic or antibiotic substances that pathogenic organisms cannot continue to live and multiply in his body Nevertheless, in spite of spectacular advances in therapeutics in this direction recently, surgical excision is still the treatment of choice in some chronic infections, and in most varieties of malignant disease, unless the necessary operation is too mutilating or the risk entailed to life too great Radiation is the best treatment for a few types, and will relieve pain and slow the progress of the disease in inoperable cases Stilbœstrol will inhibit the progress of carcinoma of the prostate But the world still waits for a chemotherapy for cancer It is not impossible Let us hope, however, that science will never discover any method for slowing down, in the fullness of their time, the otherwise inevitable degenerative changes of advancing age

The Practice of Medicine

As medicine advances, our responsibility increases There can be no escape from that conclusion It is already difficult to decide when and how many new treat ments should be used For, unlike mechanical engineers or commercial chemists, we are seldom faced with clear cut material problems as teachers, ignorant of the real nature of medical practice, sometimes suppose Many other considerations have to be taken into account, and again and again we have to take risks, for to a large extent we are often working in the dark Moreover, medical practice deals in a peculiarly intimate way with people in distress and with the hopes and fears of individual finite lives It demands, therefore, insight, personality, and understanding It is true that more scientific knowledge may be necessary as medicine becomes technically more difficult, and that critical ability and intellectual honesty, not a monopoly of the scientific mind, are required more than ever before But medicine must often reckon with abstract values of which science by the nature of its method cannot, and with moral problems of which science by the nature of its matter need not, take account Medicine cannot altogether evade the question of what the individual man should be I sometimes think that the unbalanced scientific training which our universities provide is an inadequate education for a man or woman destined to spend his or her life in the practice of the art of medicine

The prevention of disease on a large scale in many parts of the world is rapidly leading to increases in population which must inevitably result in famine unless food supplies are soon increased or the voluntary restriction of births, which is contrary to nature, comes into operation sufficiently soon to prevent disaster, which is distasteful to human sentiment But problems of this kind lie outside our individual control possibly largely outside human control We, as doctors, are mainly concerned with the individual man, woman, or child, with one individual problem after another, and the general practitioner, among other problems of this kind, with the prevention of disease in his potential patient He must make up his mind as to the extent to which it is worth trying to prevent it before it starts, or diagnose it before it has passed the stage at which it can be treated, by encouraging over careful living at the expense of loss of morale, or by insisting on repeated investigations at a considerable cost to the State He too must decide when to advise birth control on account of poverty or housing difficulties, and the circumstances under which the termination of a pregnancy is justi fiable He is confronted with many problems which he little thought of in his student days To what extent is it reasonable to relieve pain, or to allow a patient to avoid work, or gain this or that privilege, when things are short, on a medical certificate? To what extent should he help a person to avoid punishment on the strength of medical evidence? When should he approve an operation on the brain to solve the social problem created by a disorder of the mind or use endocrine preparations, as may be possible in the future—medicine being in a rapidly progressive, experimental, and correspondingly dangerous phase—to relieve physical symptoms, at the price of some deterioration in his patient's personality? When should he allow a man to refuse the operation which might save his life now that surgery has become so safe? When should he advise an operation merely to prolong life when by all ordinary standards his patient's life has long since ceased to be worth living? When, by deliberate non intervention, is he justified in letting his ageing patient depart this life in peace?

Unfortunately recent advances in medicine, which have precipitated or aggravated so many of these problems, have led to a loss of confidence all round the doctor in his capacity to deal with many of his patients, the patient even in the doctor of his choice, the State in the doctor, and the doctor in the State. Hence, the flight from the general practitioner to the specialist who sees his patient divorced from his natural environment the pregnant woman in the antenatal clinic away from her husband, the infant in a welfare centre away from its home, the child in school away from its parents, the man at work away from his wife, or the suspected case of this or that in his special clinic What opportunity has he to size up the situation as it affects an individual private life? And yet the biological characteristics of man are such that the family must remain his unit of society Far too often, I think, are they forgotten Children are dependent on their parents well into their 'teens, the next child normally arriving when the last is still at nursery age Boys and girls reach sexual maturity many years before they reach physical maturity, marriage being delayed by universal consent in civilised countries Men and women live for years, and often do their best work, long after

active sexual life is over, and eventually become dependent on their children as their children once depended on them These are statements of fact, differences between the animals and man Human health, particularly health of mind, depends to a large extent on the maintenance of family life, one of the privileges of the human race which modern economic conditions, easy divorce, and communist theory—the last two, it seems to me, based on sentiment rather than biology—are tending to disrupt Unfortunately the influence of the family doctor is slowly waning as the structure of society is changing at a time when we have no agreed philosophy of life

* * *

In these two lectures I have endeavoured to outline a concept of medicine as a single undivided whole such as an ordinary mind can grasp and on which we might all to some extent agree I have therefore described, as I see it, the nature of disease, about which we still know little, the nature of the patient, about which we know less, and the nature of the practice of medicine which grows more difficult I sometimes think, almost every day

Nevertheless, the power of medicine over human minds and human bodies "has increased, is increasing, and is likely to increase still further" I do not suggest that this power should be reduced, as Dunning once moved in the House of Commons of the increasing power of the Crown But I do venture to remind you that there is danger in power There is always danger in power, particularly in power acquired before we have decided how it should be wielded, as the release of atomic energy has recently revealed Safety in the face of coming advances in biophysics and biochemistry seems to me to lie only in the freedom of the patient to choose his own doctor, and in the freedom of the doctor to choose his own treatment Moreover the family doctor, properly trained, guided by specialist advice, and knowing all the circumstances of the individual life, should be the person mainly responsible for deciding when the increasing power of modern medicine should be used, in spite of the increasing responsibility which moral decisions of that magnitude entail.

There are difficult problems but of one thing I am absolutely certain Medicine must be organised centrally, but until we reach an agreed philosophy of life, and that prospect seems infinitely remote, I am convinced—I here venture to claim to speak above the political level—that the nature of the patient is such, and that the nature of his or her disease is such, and that the nature of medical practice is such, that under no circumstances, and in no country, and at no time should the growing power of medicine ever be handed over unfettered to the State

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The use of the term psychosomatic medicine, as if it were something new has become widespread in this country In terms of research psychosomatic medicine may justifiably be considered an independent discipline but regarding treatment of patients it is hardly more than *good* medicine with equal consideration of all factors involving the patient—physical, emotional and environmental—and with the special therapeutic skill of the psychiatrist called upon when indicated. The somewhat confused emphasis on psychosomatic medicine in this country may be partly a result of the isolation of the hospital patient from the physician who really knows him from taking care of numerous minor ailments and who knows his failings and his vagaries through knowledge of his family setting and as a member of a community However the psychosomatic point of view in medicine or in other words consideration of the patient as a whole is one of the essential attributes of the family physician —J A. HALSTED *New Engl J Med* Nov 9 1950 p 732

OBSERVATIONS ON A PROZONE PHENOMENON ENCOUNTERED IN USING THE ANTI-GLOBULIN SENSITISATION TEST

J J VAN LOGHEM M KRESNER
M.D Amsterdam
OF THE CENTRAAL LABORATORIUM VAN DEN BLOEDTRANSFUSIEDIENST, AMSTERDAM

R R A COOMBS G FULTON ROBERTS
Ph.D Camb B Sc Edin., M.R C V.S M.D Camb
OF THE DEPARTMENTS OF ANIMAL PATHOLOGY AND PATHOLOGY, UNIVERSITY OF CAMBRIDGE

IN the course of investigations on the use of the anti globulin test for detecting red cells sensitised with human antibody, van Loghem et al (1950) observed that the cells from three cases of acquired hæmolytic anæmia were negative when tested with low dilutions of some anti globulin sera When cells from these patients were tested with more dilute samples of the same anti globulin sera, however, a positive result was obtained. This prozone effect is shown in table I (taken from van Loghem et al. 1950)

On further testing various dilutions of one of these anti globulin sera (no 132) against Rh positive cells sensitised with various dilutions of incomplete anti D antiserum, it was observed that the prozone effect depended on the concentration of the sensitising antibody (anti-D) as well as on the concentration of the anti globulin serum used (table II) The diluent for these tube tests was normal rabbit serum, diluted 1 in 20, from which agglutinins against human cells had been absorbed When saline was used as a diluent, the reading of agglutination with the microscope in those tubes containing highly diluted serum was difficult and untrustworthy

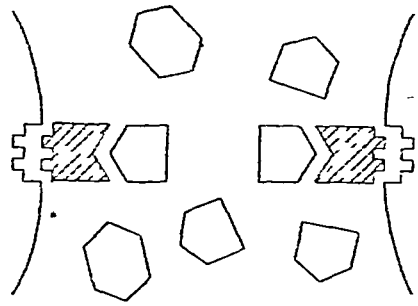


Fig 1—Parts of two red cells each carrying an incomplete anti D molecule. An incomplete form of anti-globulin antibody is attached to each globulin receptor preventing agglutinins from combining Both forms of anti-globulin antibody are in excess

An example is also given in table II of a powerful anti globulin serum, no 1914, which did not exhibit the prozone phenomenon It was thus felt that further investigation into the cause of this prozone effect would be of interest

Two possible explanations suggested themselves

(1) That the anti globulin sera contained not only powerful agglutinins operating to a titre of about 1'500 000 but also an 'incomplete form of anti globulin antibody of a much

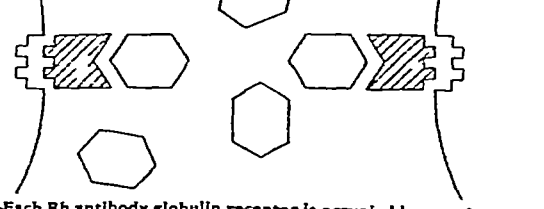
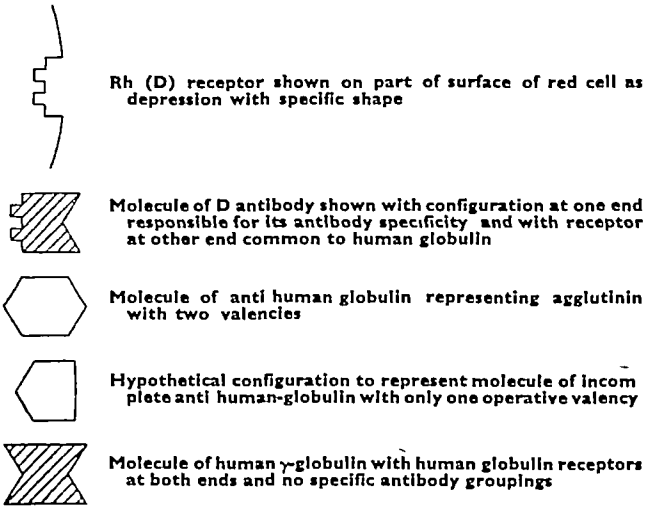


Fig 2—Each Rh antibody globulin receptor is occupied by a molecule of anti-globulin antibody and so agglutination does not take place Anti-globulin is in excess.



Key to figures 1–6

The figures are designed to represent as accurately as possible the serological properties of the reagents and have no other significance

lower titre It might be postulated that the incomplete antibody was more avid than the agglutinin and, in combining preferentially with the globulin receptors on the sensitised cells, blocked them against the action of the agglutinin (see fig 1) In the higher dilutions, however, only the agglutinin would be effective

(2) The second explanation was that the phenomenon was an inhibition due merely to antibody excess, such as is encountered in certain precipitation systems This explanation is represented in fig 2

This latter hypothesis, however, does not necessarily exclude the presence of "incomplete forms" of anti-globulin antibody which may fail to exert a significant blocking effect The hypothesis merely lays the responsibility of the causation of the prozone on the excess of the "agglutinating" antibody, whether or not an "incomplete form" is present in the serum Furthermore, this hypothesis does not exclude the possibility that in some anti globulin sera a "blocking form" of antibody may be present and cause an inhibition zone over a range similar to that observed here Though the two theories are not mutually exclusive, the evidence which we present in the following experiments favours the second

EXPERIMENT I

A 3% suspension of red cells group O, cDE/cde was allowed to react with an equal volume of incomplete anti-D antiserum (diluted 1 200) for 20 minutes at 37°C These sensitised cells were then washed four times in saline and, some being set aside, allowed to react for a further 20 minutes at 37°C with an equal volume of anti globulin serum in a dilution falling in the inhibition zone (one in three) These cells were then rapidly washed three times in saline, and two separate volumes were placed on a clean white glass tile To one volume was added an equal volume of cells sensitised only with incomplete anti D (cells set aside as above), and to the other part washed unsensitised cells were added The results, read after 3 minutes, are given in table III

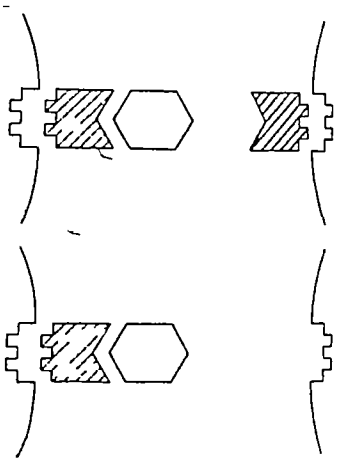


Fig 3—Left upper figure shows part of a sensitised cell that has adsorbed anti-globulin and has been washed right upper figure shows washed sensitised cell Agglutination takes place in these circumstances Lower part of figure represents control experiment in which unsensitised cells are added no agglutination takes place

It will be noticed that after the sensitised cells, which had been saturated with anti globulin antibody, had been washed, the supernatant fluids, both from the last washing and from the test cell suspension, were tested against cells sensitised with incomplete anti D, to demonstrate that no free or dissociated anti globulin antibody remained The experiment has been repeated several times both in Amsterdam and at Cambridge independently with the same result

TABLE I—AGGLUTINATION OF RED CELLS FROM THREE PATIENTS WITH HÆMOLYTIC ANÆMIA BY ANTI-HUMAN-GLOBULIN SERA

Patient	Anti globulin serum no	Dilutions of anti globulin sera														
		1 2	1 4	1 8	1 16	1 32	1 64	1 128	1 256	1 512	1 1024	1 2000	1 4000	1 8000	1 16 000	1 32 000
1	132	−	−	−	−	±	++	++	++	++	+	+	+	±	±	−
2	196	−	−	−	−	±	+	++	++	++	++	++	++	++	++	++
3	196	−	−	−	−	−	−	−	±	±	−	−				

TABLE II—AGGLUTINATION OF RH-POSITIVE RED CELLS, SENSITISED WITH VARIOUS DILUTIONS OF INCOMPLETE ANTI-D ANTISERUM, BY ANTI-HUMAN GLOBULIN SERA

Anti globulin serum no	Dilutions of incomplete anti D anti serum	Dilutions of anti-globulin serum in normal rabbit serum diluted 1 20																			
		1 2	1 4	1 8	1 16	1 32	1 64	1 128	1 256	1 512	1 1024	1 2048	1 4096	1 8192	1 16 384	1 32 000	1 64 000	1 128 000	1 250 000	1 500 000	Normal rabbit serum 1 20
132	1 64	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	−
	1 256	−	−	−	±	+	++	++	++	++	++	++	++	++	++	++	++	++	++	+	−
	1 512	−	−	−	−	−	−	+	++	++	++	++	++	++	++	++	++	++	++	(+)	−
	1 1024	−	−	−	−	−	−	−	−	−	±	++	++	++	++	++	++	++	±	−	−
	1 2048	−	−	−	−	−	−	−	−	−	−	±	++	++	+	+	±	±	−	−	−
	1 4096	−	−	−	−	−	−	−	−	−	−	−	−	±							
1914	1 64	++	++	++	++	++	++	++	++	++	++	++	++	++	−	−	−	−	−	−	−
	1 256	++	++	++	++	++	++	++	++	++	++	++	++	+	−	−	−	−	−	−	−
	1 512	++	++	++	++	++	++	++	++	++	++	++	++	+	−	−	−	−	−	−	−
	1 1024	++	++	++	++	++	++	++	++	++	++	±	±	−	−	−	−	−	−	−	−
	1 2048	++	++	++	+	±	±	−	−	−	−	−	−	−	−	−	−	−	−	−	−
	1 4096	+	+	±	−	−	−	−	−	−	−	−	−	−							

Discussion

This result supports the hypothesis that excess of antibody may be the cause of the inhibition, as illustrated in fig 3 If the test cells are saturated with an anti-globulin agglutinating antibody, it is likely that agglutination would be brought about by the addition of more antigen combining groups It must be remembered that in this system the antigen combining groups are probably molecules of antibody globulin attached to the cells, and therefore, to furnish more antigen groups, it is necessary merely to add sensitised cells, as in this experiment, this step caused the cells to agglutinate powerfully The addition of normal unsensitised cells provides no new antigen receptors, and no agglutination would be expected, in fact, no agglutination was observed It can be seen that the validity of these deductions depends on the thorough washing of the cells at each stage

It is evident that the result of this experiment does not favour the hypothesis of an "incomplete form" of anti globulin antibody as the cause of the prozone effect, for the addition of sensitised cells would be unlikely to influence the properties of the cells saturated with a "blocking form" of incomplete anti globulin antibody (see fig 4)

TABLE III—THE AGGLUTINATION OF RED CELLS, SENSITISED WITH INCOMPLETE ANTI D SERUM AND WITH ANTI GLOBULIN SERUM IN THE INHIBITION ZONE, AND SUBSEQUENTLY WASHED BY CELLS SENSITISED WITH INCOMPLETE ANTI D ANTIBODY

To	Cells sensitised with incomplete anti D and with anti-globulin serum in the inhibition zone and subsequently washed			Cells sensitised with incomplete anti D and subsequently washed (control cells)	
Added	Cells sensitised with incomplete anti D and subsequently washed	Washed unsensitised cells	Saline	Saline	Supernatant fluids from washed antiglobulin saturated cells
Results	— — +	—	—	—	—

EXPERIMENT II

A further attempt was made to strengthen the view that excess of antibody was the cause of the inhibition Cells prepared as in experiment I (sensitised with incomplete anti D and subsequently with anti globulin in the inhibition zone and washed thereafter) were added on a tile to a series of dilutions of 2½% human γ globulin (Cohn fraction) After preliminary experiments suitable dilutions of globulin were found The results, read at 3 minutes, are given in table IV Further controls for this experiment are discussed later

Discussion

If the sensitised cells were saturated with an anti-globulin agglutinating antibody, it could be argued that very small quantities of globulin might combine with the free "valencies on two or more cells and so cause agglutination (see fig 5) In these circumstances, in fact, very strong agglutination took place A large quantity of globulin, however, would merely saturate all the available combining sites without causing agglutination (see fig 6) It is difficult to see how this result could be adduced in support of an incomplete form" of anti globulin causing inhibition through blocking If, on the one hand, the "incomplete forms" of antibody fail to bring about agglutination by being univalent, it would not be expected that the addition of globulin to the test complex would so alter this univalent" property as to cause agglutination If, on the other hand the agglutination of sensitised cells is less an expression of the properties of the antibody and rather an effect of the medium in which the test is conducted —e g, albumin, or other serum-proteins—it could not be argued that the addition of a 1 in 100,000 dilution of 2½% γ globulin would so alter the environmental conditions physically as to bring about agglutination Indeed, this concentration of globulin does not cause agglutination when added to cells strongly sensitised with incomplete anti D We therefore regard this experiment as additional support to the hypothesis that the inhibition phenomenon is due to excess of antibody rather than to a "blocking form" of antibody

TABLE IV—THE AGGLUTINATION OF RED CELLS, SENSITISED WITH INCOMPLETE ANTI D SERUM AND WITH ANTI-GLOBULIN SERUM IN THE INHIBITION ZONE AND SUBSEQUENTLY WASHED BY HUMAN γ GLOBULIN

To	Cells sensitised with incomplete anti D and also with anti globulin in the inhibition zone and subsequently washed					Cells sensitised with incomplete anti D and subsequently washed (control cells)	
Added dilutions of 2½% human γ globulin	10^{-2}	10^{-3}	10^{-4}	10^{-5}	Saline	10^{-3}	Saline
Results	—	+ + +	+	—	—	—	—

OBSERVATIONS ON TECHNIQUE

The experiments described have been repeated several times with unequivocal results However, during the early stages of this work the controls on several occasions showed very weak agglutination, particularly when the experiments were conducted in tubes This irregularity necessitated further experimental investigation into the controls of the reagents employed These experiments are not described, but it was felt that some of the conclusions drawn from this work should be mentioned for the assistance of those who may wish to use this system for further investigations Certain optimal conditions were found to be desirable The red-cell suspension gives the best results at a concentration of not less than 3% To obtain good inhibition it is desirable not only to use the anti globulin serum at a dilution well within the prozone but also to sensitise the cells with the weakest dilution of incomplete anti D that will furnish a strong agglutination in the presence of the optimal concentration of anti globulin The anti globulin sera had been heated to 56°C for 30 minutes

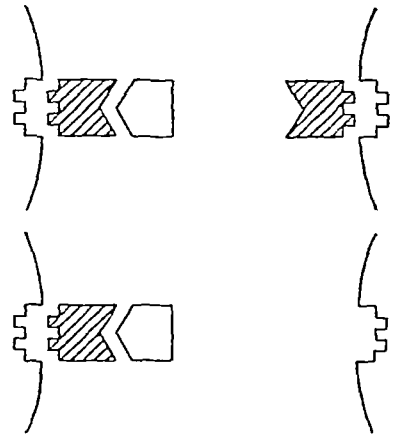


Fig 4—Sensitised cells on left have adsorbed an incomplete form of anti-globulin and have been washed The addition of washed sensitised cells (upper right) would not be expected to cause agglutination (cf fig 3)

Perhaps the most important observation made was the necessity for thoroughly washing at the start the red

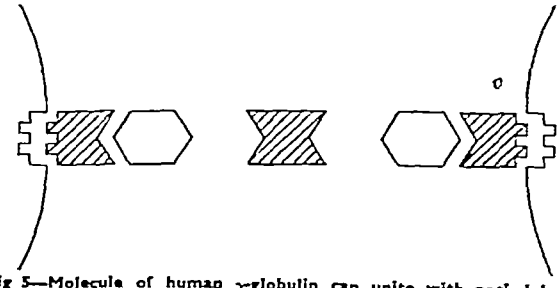


Fig 5—Molecule of human γ-globulin can unite with anti-globulin adsorbed on to sensitised cells and agglutination results.

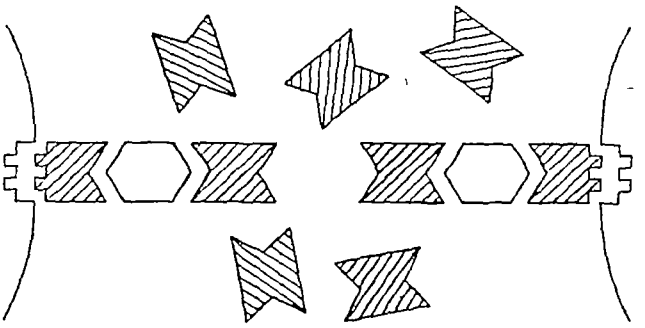


Fig 6—Excess of globulin Combining sites are saturated and agglutination does not take place

cells to be used for the normal cell control It was shown that at least four washings were necessary If the cells were washed twice or three times, a trace of serum globulin remained in association with the cell suspension and brought about weak agglutination of the sensitised cells saturated with anti globulin antibody The mechanism of this weak agglutination is thus the same as that shown in experiment II When the cells were washed four, five, six, or seven times, this effect was not observed The cells after sensitisation with incomplete anti D must likewise be washed four times for the same reason

When the sensitised cells are saturated with anti-globulin antibody, the possibility of dissociation of the anti globulin antibody from the cells required consideration This might happen spontaneously over a period of time on standing, or as a result of centrifuging Such dissociation might lead to the spontaneous agglutination of these cells For this reason we preferred to perform our experiments on a tile, where the results might be read after 3 minutes, rather than risk the delay involved at this stage by a tube test The fact that the sensitised cells, saturated with anti globulin antibody and washed four times, were still unagglutinated after 10 minutes on a tile (whether or not a volume of saline was added) showed that dissociation was not complicating our results

CONCLUSIONS

It has been found that some anti human globulin sera, when tested against red cells weakly sensitised with human globulin, exhibit a prozone The clinical significance of this observation is that, by employing such an anti-globulin serum diagnostically, falsely negative results may be obtained To overcome this difficulty it is necessary to examine the anti globulin sera in routine diagnostic use to detect whether such a prozone is present This step consists merely in titrating the anti globulin serum against cells weakly sensitised with incomplete anti D It should be remembered that the anti globulin sera should have been thoroughly absorbed with washed human cells, for weak heterogenetic agglutinins against human cells might mask the presence of a prozone Any anti globulin serum showing a significant prozone should be rejected from routine diagnostic use, for it cannot be maintained on the evidence available at present that an "optimal dilution" of an anti globulin serum as determined on one sample of sensitised cells will necessarily be optimal on another

Possibly only a few anti globulin sera will exhibit this prozone phenomenon The experiments detailed here are based on one serum showing a powerful prozone, and van Loghem et al (1950) describe three others However, it can be seen from table II that a powerful anti-globulin serum without any prozone effect may readily be obtained The table also illustrates that even anti globulin sera of this kind must be carefully assessed before use If our anti globulin serum no 1914 were titrated against strongly sensitised cells to determine the agglutinating dose, it would be necessary to use the serum at a strength of 128 agglutinating doses to detect weakly sensitised cells effectively The strength of anti globulin sera should therefore be investigated thoroughly, so that they may be used at a dilution which will detect weakly sensitised cells

The serological significances are twofold First, our experiments support the hypothesis that the prozone effect observed with this serum was due to inhibition by excess of antibody It does not seem possible to explain these results on the assumption that this inhibition was caused by a "blocking form" of incomplete anti globulin antibody However, it would not be denied that "incomplete forms" of antibody might be encountered in other anti globulin sera, nor that they might cause a prozone effect Indeed, our observations and other experiments not reported here demonstrate several unexplained properties of anti globulin sera which are now being investigated This paper is concerned solely with the cause of the prozone phenomenon encountered in one anti globulin serum

Secondly, it seems possible that the experimental results may be adduced as evidence in favour of the multivalence of antibodies, at any rate of the anti globulin antibody The term multivalence is here used to include bivalence, it does not seem possible or significant for the present argument to distinguish between bivalence and multivalence We therefore use only two alternative terms, univalence and multivalence

These experiments seem to demonstrate that, when sensitised cells are saturated with anti globulin antibody, one valency is at this stage occupied by union with the globulin combining unit attached to the red cell This complex may then be thoroughly washed free from all other materials, and then, by the sole addition of a suitable concentration of γ globulin, agglutination can be brought about The reaction at this second stage seems to indicate that one or more hitherto unsatisfied valencies are brought into combination with antigen In summary, it appears that one valency of the antibody may be occupied at one stage of the experiment and, after all other material has been washed away, a second valency or more valencies may be satisfied at another stage, judged by the visible result of agglutination

We wish to thank Mr H P Hudson and Mr C Patman for photographing the diagrams

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GAMMA GLOBULIN IN THE PREVENTION AND ATTENUATION OF MEASLES

CONTROLLED TRIALS IN DAY AND RESIDENTIAL NURSERIES *

A REPORT TO THE MEDICAL RESEARCH COUNCIL

THE gamma globulin fraction of normal human plasma, prepared by the method of Cohn and his associates (1944), has been shown by Stokes et al (1944), Ordman et al (1944), Greenberg et al (1944), and a subcommittee of the Medical Research Council (1948) to be a safe and effective agent for the passive immunisation of

* The trials were carried out on behalf of the Gamma Globulin Conference of the Medical Research Council (chairman, Sir ALAN DRURY, F R S) by Dr W C COCKBURN and Dr J A HARRINGTON of the Central Public Health Laboratory in collaboration with medical officers of health of municipal boroughs in the county of Middlesex and Sir Allan Daley, F R.C P and the staff in charge of the L C C nurseries, Dr T ANDERSON, Knightswood Hospital, Glasgow, Dr MARGARET SPROUL, senior maternity and child welfare officer, Salford, Dr B J GRIFFITHS, assistant medical officer of health Manchester, Dr A M-M PAYNE of the Public Health Laboratory Service, Oxford Dr A B SEMPLE, deputy medical officer of health Liverpool, and others

susceptible measles contacts, and to be more potent and less likely to give rise to untoward reactions than agents previously used.

At the Lister Institute of Preventive Medicine, Kekwick and Mackay (1949) developed a method for the preparation of gamma globulin in which the precipitating agent was ether instead of the ethanol used in Cohn's procedure. In 1947–48 a small amount of crude globulin prepared by the ether method was made available for controlled studies in susceptible measles contacts About 50% of the total protein in this crude globulin was gamma globulin Some was supplied as a liquid, and some was freeze-dried in separate doses for reconstitution immediately before use Preliminary studies were carried out mainly in children in day and residential nurseries during a measles epidemic, and, though the numbers were small, the modification in the severity of the illness was found to be substantially greater in children given globulin than in those given adult serum In view of these findings and the absence of untoward sequelæ a large-scale investigation was organised in day and residential nurseries in preparation for the expected rise in the incidence of measles in the early months of 1949

DETAILS OF INVESTIGATION

Globulin

The material used in most of the 1949 trials was freeze-dried in doses containing 250 mg of protein, of which 90–95% was gamma globulin, but in six trials a dose containing 500 mg of protein was given Each dose was dissolved in 3 or 6 mL of sterile distilled water immediately before injection.

TABLE I—COMPOSITION OF TRIALS, SHOWING NUMBER OF NURSERIES IN WHICH MEASLES DEVELOPED WITHIN 21 DAYS OF INOCULATION OF CONTACTS

—	London		Provinces		All areas	
	Total	Measles	Total	Measles	Total	Measles
No of nurseries	30	21	18	12	48*	33*
No of children on adult serum	329	151	128	64	457	215
No of children on gamma globulin	332	149	132	63	464	212
Total children inoculated	661	300	260	127	921	427

* Includes 6 residential nurseries

Plan of Inquiry

To assess the value of gamma globulin it was necessary to compare the experience of the children given gamma globulin with a similar group of children not so treated, and it was decided to inoculate half the children with 5 mL of adult serum or reconstituted dried plasma, which previous experience had shown would slightly modify the disease without apparently influencing the attack-rate (For convenience, both adult serum containing 0 5% phenol and reconstituted dried plasma will hereafter be called "adult serum")

In each trial centre, medical officers in charge of the investigation made a preliminary visit to the nurseries and explained the details to the matrons and staff, particularly emphasising the need for immediate notice of the first definite or suspected case of measles among the children With the coöperation of matrons it was possible in all instances to inoculate the presumed susceptible contacts within seventy-two hours of the appearance of the rash in the primary case

On being notified of the first case in one of the nurseries in his area the medical officer visited the patient or satisfied himself of the accuracy of the diagnosis by reference to the practitioner concerned. He then made a list of all the susceptible nursery contacts whose parents had consented to inoculation, dividing them into subgroups according to the intimacy of exposure (previously defined for the purpose), with the children in each subgroup in order of increasing age. The names on these lists were then divided into pairs, so the paired children were closely similar in intimacy of exposure and age. One of each pair was inoculated intramuscularly with gamma globulin and the other with adult serum, the choice being decided from lists supplied by Prof A. Bradford Hill, D SC, of the Department of Medical Statistics, London School of Hygiene and Tropical Medicine Prof. Bradford Hill, who also gave much other advice on the planning of the investigation, provided for each area a series consisting of pairs of letters —"G" for gamma globulin and "A" for adult serum— the order in which they appeared in a pair (GA or AG) having been determined by random sampling numbers. Each pair of letters was used once only and then crossed off the list Thus two similar but randomly constructed groups of children were obtained.

TABLE II—AGE AND SEX DISTRIBUTION OF CHILDREN IN THOSE SECTIONS OF NURSERIES WHERE MEASLES DEVELOPED WITHIN 21 DAYS OF INOCULATION

Age-group (months)	Children on adult serum			Children on gamma globulin		
	Male	Female	Total	Male	Female	Total
6–11	2	6	8	7	3	10
12–	35	37	72	44	32	76
24–	44	35	79	32	40	72
36–	17	13	30	19	15	34
48–60	12	14	26	10	10	20
Total	110	105	215	112	100	212
Mean age	29 8 months			28 9 months		
Male female ratio	1 05 1			1 12 1		

Since it was desirable that the severity of cases should be assessed without the observer knowing which children were in which inoculation group, the details of the inoculum given were noted on a record sheet which was filed away as soon as the inoculations in each nursery were completed, and subsequent clinical observations were recorded on a separate record sheet, the preliminary investigation had shown that it was practically impossible for the observer to remember after inoculating the children whether a particular child had been given gamma globulin or adult serum.

The inoculated children were kept under observation for twenty one days, and those in day nurseries were visited in their homes during this period if they were absent from the nursery If none of the contacts developed measles within twenty-one days of inoculation, the trial was closed

TABLE III—DEGREES OF EXPOSURE IN GLOBULIN AND ADULT-SERUM GROUPS IN NURSERIES WHERE MEASLES DEVELOPED WITHIN 21 DAYS OF INOCULATION

Nature of contact with primary case	Children on adult serum	Children on gamma globulin
Intimate	121	129
Close	73	66
Remote	21	17
Total	215	212

Intimate = contacts who played &c in the same section of the nursery as the primary case

Close = children in other sections of the nursery who were exposed for short periods eg at play or at meals

"Remote" = contact usually confined to exposure in the entrance hall in the morning or evening or out of doors during the day

TABLE IV—CASES IN INOCULATED CONTACTS IN THE GLOBULIN AND ADULT SERUM GROUPS

Age group (months)	Globulin group given 225–300 mg gamma globulin				Globulin group given 450 mg gamma globulin			
	Adult-serum group		Globulin group		Adult-serum group		Globulin group	
	Contacts inoculated	Cases	Contacts inoculated	Cases	Contacts inoculated	Cases	Contacts inoculated	Cases
6–	6	1	8	1	2	1	2	0
12–	58	21	62	14	14	6	14	1
24–	67	47	60	27	12	11	12	2
36–	25*	15	29	11	5	3	5	3
48–60	21	14	16	6	5	4	4	2
Total	177	98 (55 4%)	175	59 (33 7%)	38	25 (65 8%)	37	8 (21 6%)
—	Difference / Standard error = 21 7 / 5 17 = 4 2				Difference / Standard error = 44 2 / 10 24 = 4 3			

Scope of Inquiry

Trials were carried out in 48 nurseries, of which 6 were residential (table I) In all, 457 children were given adult serum and 464 gamma globulin In 15 nurseries no contacts developed measles within twenty one days after inoculation In the 33 nurseries in which measles developed within the prescribed period there were 215 children in the adult serum groups and 212 in the gamma globulin group (table I), only the results in these children were analysed In 27 of these nurseries, children in the globulin group were given 225 mg. of gamma globulin if under the age of 2 years and 300 mg if between 2 and 5 years, in 6 nurseries all children in the globulin group were given 450 mg All children in the comparative groups were given 5 ml of adult serum

Comparability of Globulin and Adult serum Groups

At the conclusion of the trials, the children in the globulin and adult serum groups were classified by age, sex, and intimacy of exposure, and the two groups were found to be comparable (tables II and III)

RESULTS

Attack rates (table IV)

In the nurseries where measles developed within twenty one days after inoculation and where the dosage of gamma globulin was 225–300 mg, the attack rate was 33 7% in the globulin group and 55 4% in the adult-serum group Where the dosage of gamma globulin was 450 mg the attack rate was 21 6% in the globulin group and 65 8% in the adult serum group, the numbers in the latter trials were small—37 in the globulin group and 38 in the adult serum group The differences in attack rates in the two groups in both sets of trials were statistically significant

Modification of Severity

Three criteria were used to assess the degree of modification in children who developed measles after inoculation —the character and distribution of the rash, the duration of the prodromal period, and the opinion of the observer on the severity of each attack as a whole It was felt that in trials of this nature, where regular temperature recordings could not be obtained and where the number of visits which could be paid to the homes of the patients was limited, these were the only criteria which could be satisfied in all cases As was mentioned, all observations were made and recorded without the observer knowing whether the case was in the globulin or adult serum group

(*a*) *Character of rash*—In each case an attempt was made to assess the number and appearance of macules on the face, trunk, and limbs when the rash was most pronounced in these areas (table V) Of the 121 children on adult serum 78%, 77%, and 38% showed semi confluent or numerous discrete macules on the face, trunk, and limbs respectively, the corresponding ratios for the globulin group on 225–300 mg were 22%, 26%, and 9%, while none of the 8 children on 450 mg of gamma globulin developed a rash to this extent

TABLE V—CHARACTER OF MEASLES RASH IN THE INOCULATED CHILDREN

Type of macules*	Children on adult serum			Children on 225–300 mg gamma globulin			Children on 450 mg gamma globulin		
	Face	Trunk	Limbs	Face	Trunk	Limbs	Face	Trunk	Limbs
Numerous semi confluent	48	33	12	3	2	1	–	–	–
Numerous discrete	46	60	34	10	13	4	–	–	–
Sparse	24	26	55	25	25	17	1	4	–
Occasional	3	2	16	17	17	15	6	4	2
None	0	0	4	3	1	21	1	–	6
Total	121	121	121	58	58	58	8	8	8

* *Note* In tables V–VII 2 cases on adult serum and one case on globulin have been omitted because the course of the disease in these cases could not be accurately assessed It was however definitely established that they developed measles within 21 days and they have therefore been included in tables I–IV

TABLE VI—DURATION OF PRODROMAL SYMPTOMS IN THE INOCULATED

Duration (in hours)	Children on adult serum	Children on 225–300 mg gamma globulin	Children on 450 mg gamma globulin
No prodromals	1 (0 8%)	7 (12%)	4 (50%)
< 24	12 (9 9%)	22 (38%)	4 (50%)
24 –	46 (38%)	18 (31%)	—
48 –	30 (25%)	4 (6 9%)	—
72 +	32 (26%)	7 (12%)	—
Total	121	58	8

(*b*) *Prodromal symptoms*—The globulin and adult serum groups differed considerably in the duration of the prodromal stage In the globulin group on 225–300 mg of gamma globulin, 29 children (50%) had no prodromal illness or one lasting less than twenty four hours before the appearance of the rash, in the adult serum group only 13 children (10 7%) were placed in this category, none of the 8 children who developed measles after 450 mg of gamma globulin had a prodromal period exceeding twenty four hours (table VI)

(*c*) *Observer's opinion of severity*—The type of rash and duration of prodromal symptoms did not always give a satisfactory measure of the degree of modification Some children had a well marked rash with no apparent constitutional disturbance or pyrexia In each case of measles following inoculation therefore an attempt was made to assess the degree of modification by taking all clinical findings into account, and each child was assigned to one of four categories, as follows

Excellent modification minimal rash, prodromal symptoms very slight or absent no catarrh or constitutional upset

Satisfactory modification rash catarrhal symptoms, and constitutional upset only slight with rapid recovery

Doubtful modification symptoms and signs that could not readily be distinguished from a mild atttack of the natural disease

No modification indistinguishable from a natural typical attack.

Table VII shows that in 93% of cases following 225–300 mg of gamma globulin and in all of the 8 cases on 450 mg the signs and symptoms were readily distinguishable from those of the natural disease, whereas in the adult serum group only 51% of cases showed significant modification This difference is clearly (and technically) very unlikely to have arisen by chance

TABLE VII—GENERAL ASSESSMENT OF CASES OF MEASLES IN THE INOCULATED

Prophylactic	Total cases	Excellent modification	Satisfactory modification	Doubtful modification	No modification
Adult serum	121	13 (10 5%)	49 (40 5%)	34 (28%)	25 (21%)
Gamma globulin 225–300 mg	58	33 (57%)	21 (36%)	2 (3 4%)	2 (3 4%)
Gamma globulin 450 mg	8	8 (100%)			

Complications

In the adult serum group, 5 children developed complications, 1 had bronchopneumonia, 1 gastroenteritis, 1 acute otitis media, 1 purulent conjunctivitis, and 1 bronchopneumonia with purulent conjunctivitis, all recovered

In the globulin group, complications occurred in 2 children, both on the 225–300 mg dosage, one developed a recrudescence of a chronic otitis media fourteen days after recovery from a modified attack of measles, the other, who had recently had tonsillitis, developed otitis media and cervical adenitis two days after the rash appeared

Reactions

Apart from transient stiffness of the limb lasting one or two hours after inoculation in a few cases, no local reactions were observed in the globulin or adult serum groups One child in the globulin group developed, three days after inoculation, an urticarial rash which disappeared in twenty four hours

DISCUSSION

Effectiveness of Gamma Globulin and Adult Serum

Analysis of the results obtained indicates that gamma globulin prepared by an ether fractionation method is a valuable agent in measles prophylaxis, when given in adequate doses to exposed susceptible contacts within three days of the appearance of the rash in the infecting case it will either prevent or modify the disease in nearly every case Adult serum in 5 ml doses, though inferior to gamma globulin in its protective and attenuating action, results in some modification of the attack, in this investigation, 51% of the cases of measles in the serum treated group were classed as modified

TABLE VIII—EFFECT OF DEGREE OF EXPOSURE ON THE OCCURRENCE OF MEASLES IN ALL DAY NURSERY SECTIONS IN WHICH SUSCEPTIBLE CONTACTS WERE INOCULATED WITH GAMMA GLOBULIN AND ADULT SERUM

Day nursery section	Contact with infective case		
	Intimate*	Close*	Remote*
Sections where measles developed	26	12	3
Sections where measles did not develop	16	23	19
Total	42	35	22

* For definitions see table III

Dosage of Gamma Globulin

The optimum dose to prevent or modify measles depends on many factors during the trials it was found impossible to predict for any individual child whether prevention or modification would result This variation in individual susceptibility, previously noted by Stokes and his associates (1944), makes it difficult to construct a dosage table applicable to all children Some American workers based their dosage on body-weight, but it was found less difficult and equally satisfactory to base the dosage for children on age It was clear that gamma globulin in doses of 225–300 mg prevented measles in some cases, but it could not be relied on to prevent the disease in all children under 5 years of age The attack-rates for children on 450 mg of gamma globulin and on 5 ml of adult serum were, for those aged 6–23 months, 6 3% and 43 8%, and for those aged 24–60 months, 33 3% and 77 3% respectively, in neither group therefore did 450 mg assure protection

Supply of Gamma Globulin

In view of the complexity and cost of producing human gamma globulin it seems that it will have to be reserved for contacts in hospitals, and for children whose health is such that an attack of measles would endanger their life For general use, adult serum or plasma will still have to be relied on

Duration of Passive Immunity

In some nursery trials in one area, where the children were observed for more than twenty one days after inoculation with 225–300 mg of gamma globulin, modification occurred up to six weeks, though its degree decreased rapidly towards the end of this period With a dose of 450 mg, the duration of protection was more apparent, in one residential nursery trial, during the period 22–42 days after inoculation, 1 out of 15 remaining susceptible contacts in the globulin group developed measles after re exposure, compared with 7 out of 3 in the adult serum group, and in another, where the same dosage was used, none of the 10 remaining susceptible contacts on gamma globulin developed measles, compared with 4 out of 7 on adult serum

These observations support the view (Janeway 1944) that dosage is an important factor in determining the duration of passive immunity, and that, given in adequate doses, gamma globulin may prevent or modify the disease for more than three weeks after inoculation

Effect of Degree and Intimacy of Exposure

Most of the day nurseries in which trials were carried out were divided into three sections Susceptible contacts in the same section as the primary infecting case were in nearly all instances intimately exposed, whereas children in other sections were exposed less intimately

The effect of the degree of exposure on the occurrence of measles in susceptible contacts who were inoculated with gamma globulin and adult serum in 99 separate day nursery sections is shown in table VIII One or more cases of measles occurred in 26 (61 9%) of the 42 nursery sections in which "intimate" contacts were inoculated, in 12 (34 3%) of the 35 sections where "close" contacts were inoculated, and in 3 (13 6%) of the 22 sections in which remote contacts were inoculated

These results suggest the need for consideration before inoculating remote contacts in nurseries The risk of such contacts developing measles from the primary case appears to be small, and in view of the need for economy in measles prophylactics, it may be advisable to postpone inoculation in such cases until the children are more intimately exposed to secondary cases

Infectivity of Measles

During the investigation, 9 day nurseries were observed in which the primary infective case had been absent

from the nursery for sixty to seventy two hours before the rash appeared Although none of the susceptible contacts in these nurseries had been inoculated, only 1 child developed measles within twenty one days after exposure It seems therefore that measles was not readily transmitted in day nurseries by cases which were isolated 2½–3 days before the appearance of the rash In some instances children who developed well modified attacks after gamma globulin were permitted to return to the nursery seven days after the appearance of the rash, and no secondary cases resulted

Loss of Potency of Crude Globulin on Storage

In the preliminary investigation a batch of crude globulin held as a fluid was stored at 4°C from March, 1947, to January, 1948 It was used in March, 1947, and gave satisfactory modification When used in January, 1948, it had lost potency, and in 9 out of 17 close contacts who developed measles within twenty one days of inoculation there was no evidence of modification In contrast, a similar dried batch of globulin retained its potency over the same period For this reason all subsequent batches were dried and reconstituted immediately before use

RECOMMENDATIONS

On the basis of the results obtained in the trials the following dosage schedule is suggested

Age of children (mos)	*Dosage of gamma globulin (mg) where*		
	modification is desired	*prevention is desired*	*prevention is essential*
6–23	150–225	450	675
24–59	225–300	675	900

The inoculation should be given within seventy two hours of the appearance of the rash in the primary infecting case, where this is not possible the dose may have to be increased

SUMMARY

In a series of controlled trials in day nurseries, gamma globulin was given in 225–450 mg doses to 212 susceptible measles contacts between the ages of 6 months and 5 years, 31 6% developed measles and 94% of these showed excellent or satisfactory modification Adult serum was given in 5 ml doses to 215 contacts of similar age and exposure, 57 2% developed measles, and 48 9% of these showed no (or doubtful) evidence of modification

The attack rates for children receiving 225–300 mg and 450 mg of gamma globulin were 33 7% and 21 6% respectively, whereas in the corresponding groups of children receiving 5 ml of adult serum the rates were 55 4% and 65 8% The duration of passive immunity depended on dosage, with the larger dose some protection for periods up to six weeks was observed

Recommendations are made on the dose of gamma globulin to be given to exposed children at different ages to modify or prevent an expected attack of measles

Reactions to the prophylactic injections in this trial were minimal and unimportant

No serious complications were observed in the globulin group

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STERILITY DUE TO CONGENITAL ABSENCE OF THE VASA

BERNARD SANDLER
M D Manc, D.M R, D Obst
MEDICAL OFFICER TO THE SUBFERTILITY CLINIC, MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL

IN 1948 Young reported a case of congenital absence of the vas as being the first on record in this country

In America Engle (1947) noted the condition, Michelson (1947a) reported the vas absent in 4 (3%) of 86 cases of azoöspermia, while both Simmons (1945) and Charny (1945) put the incidence at about 5% Mazer and Israels (1941) in 308 cases of male infertility, found 45 due to obstructive azoöspermia, of which 4 were due to congenital atresia The German author Dirr (1940) gave the incidence of atresia as approximately 0 05% in all operations on the vas

The difference in these figures may be due to the fact that the Germans were sterilising normal fertile males as part of their fantastic racial purity campaign, while American cases were all from subfertility clinics

In France, Laffont and Ezes (1949) report the condition but say that in half the cases it is possible to do an anastomosis, which in half of these is successful Such a success rate is not equalled in reports from clinics in other countries Bayle (1950) reports an incidence of 4% with 65% cures

At the Conference on Sterility held in Edinburgh in September, 1949, Tulloch said that the condition is commoner than hitherto believed, and his incidence rate would probably have been higher if he had not regarded the presence of a palpable cord as evidence that the vas is patent As the following case shows, it is not reliable evidence

CASE REPORT

A man, aged 29 who had been married 4 years, attended the clinic in June, 1949 because of sterility Azoöspermia had been diagnosed in May, 1949, and confirmed in three successive specimens He had normal coitus three times weekly, with satisfactory orgasm both for himself and his wife The wife had been examined at another hospital, and as she was said to be "small," curettage had been arranged, although the diagnosis of azoöspermia had been originally made there!

The man was of normal spare build, with normal hair distribution and adult male voice There was no evidence of pituitary or other endocrine dysfunction There was a small left varix Both testes were in the scrotum, they were small and soft, but testicular sensation was present Tissues resembling cords were palpable on both sides The penis was normal in size and shape I performed a testicular biopsy which revealed active spermatogenesis in both testes In view of this I advised exploration, which was undertaken by Mr H M Goldberg, F R C S, to whom I am indebted for his help

Operation—On delivering the testes through an incision in the upper part of the scrotum, it was seen that both epididymes were small, flattened, and not of the usual shape. The right globus major appeared normal The lower half of the body and the tail were composed of greatly dilated, thin walled ducts, filled with a yellowish creamy material The right spermatic cord was examined, but no trace was found of the vas, or of any rudimentary structure resembling it On the left side an extremely thin rudimentary vas was found with much difficulty The lumen was so small that it admitted only a fine hypodermic needle An attempt was made to inject methylene blue to determine the patency of the ejaculatory duct The lower pole of the left epididymis showed changes similar to those on the other side Microscopically the material aspirated from the right side consisted of amorphous debris and spermatozoa were not seen

The tunica albuginea of the left globus major was incised, and the underlying tissue gently opened up Confirmation that this tissue contained some seminiferous tubules was obtained by pressing a glass slide on the epididymal tissue and finding active spermatozoa under the microscope These spermatozoa survived more than 2 hours

A longitudinal incision into the rudimentary vas was made, and the edges were anastomosed to the edges of the tunica

albuginea Unfortunately subsequent semen analysis has not revealed the presence of spermatozoa Presumably the vas was too rudimentary to perform its function, or anastomosis was unsuccessful

METHODS OF TREATMENT

Much work is now being done, particularly in America, on the best method of performing anastomosis But the successful results reported by some authors (Cameron 1945, Michelson 1946), are for anastomosis of tubes which were originally normal but later became occluded (e g, after gonorrhœa or by vasectomy) In congenital atresia, on the other hand, maldevelopment may not be confined to the vas, and often extends to other genital structures Though the actual anastomosis may be successful in these cases, anatomical defects elsewhere may prevent spermatozoa from appearing in the semen

To keep the anastomosis open, various ingenious methods of utilising silver wire, 'Nylon,' and other materials have been devised (Hagner 1936, Michelson 1946, 1947b and c)

When operation fails, what can be done? Some workers (Schultze 1941, Guttmacher 1942, Sangree 1947) have tried the insemination of sperm obtained by aspiration of the epididymis, but without success Lespinasse (1947) has advocated the opening of the epididymis so that spermatozoa may flow freely into the tunica vaginalis, but he does not say what success has followed It does seem very tragic that when live spermatozoa can be demonstrated in the epididymis they cannot be used for insemination The work of Henle and Zittle (1942) throws some light on the reason for failure

Comparing the metabolism of epididymial and ejaculate spermatozoa in the bull, they found a remarkable change Whereas glucose can be oxidised rapidly by epididymial spermatozoa, in the ejaculate there was no oxidation of glucose at all—in fact the addition of glucose depressed oxidation

Spermatozoa living in germinal epithelium must have energy processes more economical to the substrate These spermatozoa begin their development with all these complex mechanisms present, which become "hangovers" in ejaculate spermatozoa Thus the cytochrome (respiratory) system persists in ejaculate spermatozoa, though they do not respire in the ejaculate It would be much more economical for spermatozoa to use the energy of respiration The breakdown of glucose to lactic acid to give energy is most wasteful (McLeod 1946) for ten times as much sugar is used to get a unit of energy by that method than by the oxidation of a molecule of glucose

In this connection the presence of adequate carbohydrate in normal cervical mucus as a natural occurrence is of special significance The absence of such carbohydrate has been shown (Barton 1948) to be a factor in certain types of infertility

It would seem that epididymial spermatozoa are not equipped to live in the cervix until they have developed their new method of metabolism—any more than a fœtus removed from the uterus can survive before it has developed an adequate respiratory system through the lungs The best hope for the future lies in the biochemist providing us with a substrate in which epididymial spermatozoa could live until such time as they have perfected their mechanisms for living like ordinary mature spermatozoa, by the breakdown of glucose to lactic acid

SUMMARY

A case of sterility with azoöspermia due to congenital atresia of the vas is described Active spermatogenesis was present in both testes Vaso epididymial anastomosis was attempted without success This condition is more frequent than is generally supposed, and should be sought in all cases of azoöspermia where there is no history of infection

(*References at foot of next column*)

APLASIA OF THE VASA DEFERENTIA AS A CAUSE OF STERILITY

GEORGE L FOSS
V R.D M A, M.D Camb
CLINICAL ASSISTANT DEPARTMENT OF MEDICINE AND GYNÆCOLOGICAL OUTPATIENT DEPARTMENT, BRISTOL ROYAL HOSPITAL

ASHTON MILLER
M.A, M D Camb, F R C S
LECTURER IN SURGERY IN THE UNIVERSITY OF BRISTOL, CONSULTANT SURGEON, BRISTOL ROYAL HOSPITAL

IN the routine investigation of 200 cases of male infertility during the last four years bilateral aplasia of the vas deferens was found in 3 otherwise normal men If careful search were made for the condition, it would probably prove to be a commoner cause of absolute sterility than is suggested by the number of published reports

Demel (1926) reviewed 12 recorded cases In 7 the seminal vesicle, ejaculatory duct, kidney, and ureter, as well as part or all of the epididymis and vas deferens on one side had not properly developed In most of these only the globus major or head of the epididymis was present, in 2 cases the body of the epididymis was also present, and in 1 case only a vestige of the epididymis was found In all the testes spermatogenic tissue was present and normal Blecher (1931) also reported 6 cases, and Priesel (1924, 1931) 1 case

The Nazi habit of sterilising men for various reasons provided a great opportunity for discovering this congenital defect, and Vorstoffel (1937), in a review of the German literature up to 1936, found records of 22 cases of complete or partial absence of the vas deferens, these included 2 cases in which the vas deferens on both sides was a slender fibrous cord, 2 in which the vas deferens and epididymis on both sides were missing, and 2 with normal testes and epididymes but no vas deferens and kidney on one side

Dirr (1940) reported 2 cases of unilateral absence of the vas deferens in a series of 45 ligations, and stated that the incidence of this anomaly was 0 5% in all operations of this type in Germany Olesen and Faber (1944) described 2 cases of bilateral aplasia

Charny (1946), discussing his findings in 308 men subjected to testicular biopsy for impaired fertility, reported 4 cases of congenital absence of the vasa deferentia in patients with azoöspermia and normal spermatogenesis In an analysis of 146 cases of azoöspermia Michelson (1947) found that clinically there was bilateral absence of the vasa in 4 patients, but that this was confirmed in only 1 case

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Young (1949) was the first to report a case in this country He describes the findings in an infertile man, aged 28, with *azoöspermia*, absence of fructose in the semen, and normal spermatogenesis as shown by testicular biopsy No abnormality of the vasa was noted clinically, but after careful exploration thin fibrous cords were found on both sides, and no lumen in this tissue was found microscopically Young discusses the embryology of the genital tract and points out that, if development is disturbed before the 60 mm stage, it is possible to have a fully developed testis and epididymis with an undeveloped vas deferens, ejaculatory duct, and seminal vesicle If the epididymis is present it is unlikely that the vas is ever completely absent, it is more likely to be present in an undeveloped state If the vas is undeveloped, it is impossible to have a normal seminal vesicle or ejaculatory duct

Michelson (1949) reported 12 abnormalities of the vas in 900 subfertile men, 11 of these were bilateral In 8 cases, however, he did not confirm these findings by operative exploration and in 1 of the operated cases only one side was examined He cites personal communications from R S Hotchkiss, who had 20 cases, and F A Simmons, who had about 8 with the same incidence

Kenneth Walker, at the meeting of the Fertility Society this year, drew attention to this anomaly and said he had seen several cases

PRESENT SERIES

Of the 200 men investigated, 37 (18%) proved to have complete azoöspermia Bilateral aplasia of the vas was the cause in 3 of these, which is an incidence of 1 5% in the total series and 8% in the patients with azoöspermia Excluding from the 37 patients 21 who had testicular agenesis, bilateral cryptorchism, tuberculous epididymitis, or atrophy following surgical attempts to bring down undescended testes, we are left with 16 who had testes of normal size on clinical examination, and among these the incidence of bilateral aplasia of the vas deferens was 18%

CASE RECORDS

Case 1 —An electrical engineer, aged 39, who had been married for six years without begetting any children, was referred for routine examination There was no history of venereal disease or injury, and no family history of impaired fertility His sexual development had been normal, and there were no abnormalities of sexual technique or function, orgasm occurred rather rapidly, with an outwardly normal seminal emission

On examination the patient was a strong healthy man His penis and both testes were normal in size and shape, and testicular sensation was present on pressure The upper poles of the epididymis on both sides felt cystic, but no abnormality of the cord or vas was noted at the time

Semen —Two masturbation samples of semen were of small volume, 1 or 2 ml, consisting of abnormally clear mucoid fluid There was complete azoöspermia after centrifuging, and the fluid only contained a few lipoid granules, probably of prostatic origin

Biopsy of both testes was carried out under thiopentone anæsthesia, using the punch described by Friedmann (1948), and sections showed that spermatogenesis, although not very vigorous, was active There was no hyalinisation of the capsules or fibrosis of the interstitial tissue

Surgical Exploration (A M) —The testes were both normal, but the upper pole of the epididymis on both sides was cystic Puncture of the epididymes with a needle and immediate microscopy revealed plenty of active and apparently normal spermatozoa There were no bodies or tails to the epididymes, and both vasa were completely absent

It was hoped to attempt artificial insemination by puncture of the cystic epididymes at the appropriate time in his wife s cycle, but the couple, perhaps wisely, decided to adopt a child

Case 2 —This patient a general warehouseman aged 29, had been married for four years before he decided to be investigated There was no history of previous illness and no infertility in his family He had developed sexually at the age of 12 years, masturbation had been normal, as were sexual technique and function

On examination he was of rather slim build but otherwise healthy His penis was normal and circumcised Both testes were equal in size, of good shape, and firm, and normal testicular sensation was elicited on pressure The upper pole of the epididymis on both sides was enlarged and soft, and the lower pole could not be felt The vas could not be palpated in the scrotum on the right side, but a normal vas was palpable on the left

Semen —Two seminal analyses showed an abnormally clear and slightly milky fluid (volume not recorded) Spermatozoa were absent from both

Testicular biopsy on both sides was carried out under light thiopentone anæsthesia On section the tubules of both testes were thin walled and well filled with active spermatogonia and spermatocytes, many tubules containing numerous adult spermatozoa The interstitial tissues, particularly on the right side, showed some fibrosis

Surgical Exploration (A M) —On the left side the vas, which appeared normal, was easily traced down to the level of the upper pole of the epididymis where it ended suddenly, there was a tenuous fibrous cord connecting it to the region of the body of the epididymis The lower pole of the epididymis was absent and only the upper pole and body were identified On the right side no vas was found in the scrotum, and only the upper pole of the epididymis was present

Case 3 —A plate layer, aged 40, had been married for fourteen years, and he and his wife had already adopted one child As a last hope he presented himself for investigation There was no history of illness or venereal disease, and his two brothers and three sisters all had large families Sexual development had occurred normally at the age of 13, and he was fairly sure that as a youth he had produced a reasonable amount of fluid on masturbation Now, however, although sexual sensation was normal at coitus, orgasm was an odd stinging sensation and he had no feeling of emission Masturbation had since shown that the emission consisted of a little sticky moisture

Examination —He was of slight build and healthy His penis was circumcised and normal in size Both testes were large and firm, with cystic upper poles of the epididymes No vasa could be felt, so bilateral aplasia was diagnosed The diagnosis was so certain that seminal analysis and testicular biopsy were made on the same day The former showed only a few drops of whitish fluid No spermatozoa were seen in the direct smears, and the specimen was insufficient for further examination

Testicular biopsy showed normal spermatogenesis in the right testis, but on the left side the tubules were distorted and fibrosed few adult spermatozoa being seen

Surgical Exploration (A M) —There was no sign of a vas on either side between the external abdominal ring and the lower pole of the epididymis, which was slightly larger than normal owing to multiple small cysts, mostly in the upper pole, on both sides

SUMMARY

Three cases of bilateral aplasia of the vas deferens were found among 200 males investigated for possible infertility, this is an incidence of 1 5% Further analysis shows an incidence of 8% in cases with azoöspermia, and of 18% in cases with azoöspermia and clinically normal testes

As a possible cause of sterility, aplasia of the vasa deferentia should be more generally borne in mind

Our thanks are due to Dr A L Taylor for seminal analyses and for reports on the testicular biopsies, and to the members of the consulting staff of the Bristol Royal Hospital for referring cases

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LIQUEFACTION OF VISCOUS PURULENT EXUDATES BY DEOXYRIBONUCLEASE

JOHN B ARMSTRONG
M.D Toronto
JUNIOR REGISTRAR IN MEDICINE

J C WHITE
M B Birm
LECTURER IN HÆMATOLOGY

POSTGRADUATE MEDICAL SCHOOL OF LONDON

IN VITRO experiments and a few clinical observations have been made on reduction in the viscosity of purulent sputa and pleural exudates by the action of the enzyme deoxyribonuclease (D N ase) derived from ox pancreas The enzyme is acting here on extracellular hydrated fibrils of deoxyribonucleoprotein (D N P) The basis of this work is as follows

Basis of Cellular Nucleic Acids—In 1868, Miescher isolated deoxyribonucleic acid (D N A) from pus cells Considerable evidence now indicates the importance of both this substance and ribonucleic acid in all living cells (Brachet 1942, Caspersson 1947 Davidson 1949) Physical and chemical differences exist between the two acids, and solutions of D N A and D N P are much more viscous than those of ribonucleic acid and ribonucleoprotein, probably owing to their highly polymerised macromolecular state (Gulland and Jordan 1947)

Enzymes Degrading Nucleic Acids—Specific enzymes degrade both acids D N ase is widely distributed—e g, in rice bran (Serra and Queiroz Lopes 1944), yeast (Zamenhof and Chargaff 1949), and certain hæmolytic streptococci—and is usually obtained pure from beef pancreas by the method of McCarty (1946) or crystalline by that of Kunitz (1950)

When activated by magnesium or certain other ions the enzyme rapidly reduces the viscosity of D N A or D N P solutions, the action being apparently a depolymerisation (Greenstein et al 1947, Jungner 1950)

D N ase action on fixed cells is readily demonstrated cytochemically (Brachet 1942, Sanders 1946, Catcheside and Holmes 1947, Davidson 1947, Brachet and Shaver 1948 White 1950) The nucleases do not, however act on living cells (Davidson et al. 1948, Ely and Ross 1949), but nucleic acids in extracellular accumulations and in disintegrating cells are readily affected

Viscosity of Pus, and its Reduction by Streptococcal Enzymes—Since 1933 Tillett has devoted a great deal of study to the fibrinolytic activity of hæmolytic streptococci In the course of these investigations Sherry et al (1948) have shown that in many purulent pleural exudates fibrin may be a less important cause of thickness and viscosity than D N P, which may constitute 30–70% of the total solids present Tillett et al. (1948) have demonstrated further that the D N P may be liquefied by streptodornase, a D N ase present in concentrates from cultures of hæmolytic streptococci particularly of group A This enzyme is quite distinct from the concomitant streptokinase, a fibrinolysin which liquefies fibrin clots Dramatic clinical improvement has been described following the injection of such concentrates into the pleural cavity of patients with fibrinous purulent, and sanguineous pleural exudates (Tillett and Sherry 1949, Sherry et al 1949), and after "streptococcal enzymatic debridement" of infected surface areas (Tillett et al. 1950, *Lancet* 1950)

Extracellular Fibres of D.N.P—Fibres seem to be formed readily by the alignment of the D N A or D N P macromolecules This may well be important in chromosome structure (Astbury and Bell 1938, Mazia et al 1947, Bateman 1947)

Under various conditions an apparently thixotropic change (gel→sol→gel) leads to the formation of fibres or of rods from whole cell nuclei

(1) Rod like nuclear extrusions at the periphery of some cutting diathermy and aspiration biopsies

(2) Isolated leukæmic nuclei transformed into cylinders by application of pressure

(3) A viscous mass of fibres forms when leukæmic lymphocytes are stirred into molar sodium chloride for D.N.P preparation by the method of Mirsky and Pollister (1946) These finally disperse into solution and D.N P fibres ('chromosin') again precipitate on pouring into 6 volumes of water

(4) Simple storage of leukæmic cells in their plasma for three weeks at 5°C can yield a viscous mass of D N P fibrils derived from the nuclei

In all instances a positive Feulgen reaction indicates that the fibres contain D N A Although physical forces operate in examples (1) to (3), in (4) the cells were undisturbed, but autolytic enzymatic changes may have played a part

VISCOSITY OF SPUTUM AND D N P

Many samples of purulent sputum possess great viscosity and resistance to flow, and on cytochemical examination prove to have a fibrillar structure due to D N P and similar to the examples previously detailed. Movement due to respiration, coughing and ciliary action may all play a part in forming fibres from leucocyte nuclei and the result is a mass which is expectorated only with difficulty

Thorough centrifugation of such sputa produces the classical three layers Cytochemical examination shows that the topmost layer is clear and viscous, only a few mm in depth, and contains a minimum of cellular and fibrillary material demonstrable with the Feulgen stain, though a good deal of coagulated protein without D N A is present, the bottom layer is granular, and the Feulgen stain reveals many leucocytes and coarse strands of Feulgen positive material, and the middle layer, which is by far the most copious, is an extremely viscid mass of vertically oriented fibrils attached to the bottom layer and entangling intact leucocytes Phase contrast microscopy also clearly reveals these fibrils both in centrifuged sputum and in fresh unsmeared sputum This seems to dispose of the possibility that the fibrils are formed as a smear or fixation artefact, though fixation will alter the state of their hydration

The work presented here is largely concerned with rendering such purulent sputum more liquid by the action of D N ase, and with the possibility of administering the enzyme by spray inhalation to patients with chronic bronchitis, bronchiectasis, and similar chest disorders in which tenacity and high viscosity of the purulent material presents difficulty in management

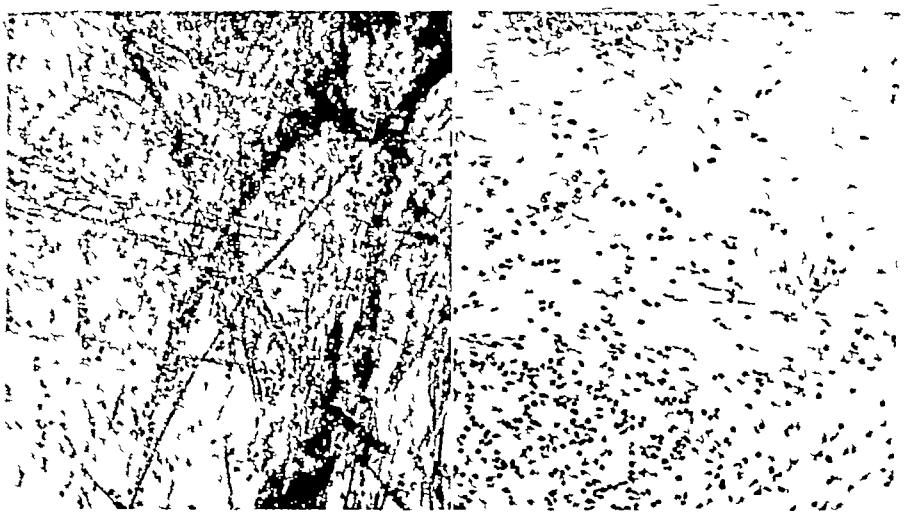
METHODS

Deoxyribonuclease

The enzyme D N ase, was isolated from beef pancreas by the method of McCarty (1946) and freeze dried The preparation principally entails repeated fractionation with the aid of ammonium sulphate, and is lengthy but requires little expensive apparatus or reagents We are, however, grateful to Mr E G Wright of the Government Research Institute, Weybridge for freeze drying our final dialysed solution of purified enzyme The resulting white solid soluble enzyme was stored in vacuo at 5°C A yield of about 2 5 g of dry enzyme was obtained from 10 kg of pancreas

Tests for toxicity to rabbits were made by intravenous injection (20 mg in each of two injections at an interval of ten days) and intratracheally There were no demonstrable toxic effects, but serum taken ten days after the second intravenous injection gave a precipitin reaction with D N ase and inhibited the enzyme activity to a considerable extent cytochemically, suggesting the development of an antibody The specificity of these reactions is now being investigated

Stock solutions of the enzyme were made, up at a concentration of 0 05 mg per ml or more, in *M*/50 $MgCl_2$ solution containing 1% gelatin The magnesium



(a) (b)

Fig 1—Photomicrographs of sputum wet fixed in Susa solution and Feulgen-stained: (a) purulent sputum showing Feulgen positive fibrils arranged in strands and entangling leucocytes (b) non purulent mucinous sputum showing Feulgen reaction confined to nuclei of leucocytes, which are embedded in muco-protein (×100)

ion is an obligatory activator, and the gelatin protects the unstable enzyme in solution The fresh solution was sterilised by Seitz filtering, dispensed in 5 ml bottles, and stored at 5°C Full bacteriological tests for sterility were made through the kindness of Dr W Hayes and Dr G I M Ross

Cytochemical Tests

For investigating the action of the enzyme we have used a technique previously found reliable in the study of cellular nucleoproteins (White 1947, 1950) D N ase activity was very high, and proteolytic activity not appreciable at enzyme concentrations up to 0 2 mg per ml, though slight proteolysis occurred at higher concentrations No appreciable fibrinolytic activity was shown at a final concentration of 0 5 mg per ml, only slight softening of the fibrin clot, without any liquefaction occurred after eighteen hours at 37°C

The sputum samples were smeared on to glass slides and fixed while wet in Susa solution for an hour Wet preparations of blood cells or other test preparations were fixed in the same way In the in vitro experiments the slides were covered with test enzyme solution or control solution minus enzyme, and kept at room temperature, or at 37°C, for an hour or more Next they were washed and stained by the pyronin methyl green or Feulgen methods The latter is generally considered a highly specific cytochemical test for D N A (Feulgen and Rossenbeck 1924), and the former method gives a useful and reliable distinction between the two forms of nucleic acid (Brachet 1942)

In the Feulgen preparations of purulent sputa long fibrils of Feulgen positive material are to be seen running between the leucocytes and enmeshing them In comparative studies changes in the number and structure of these fibrils are readily appreciated on high power microscopy

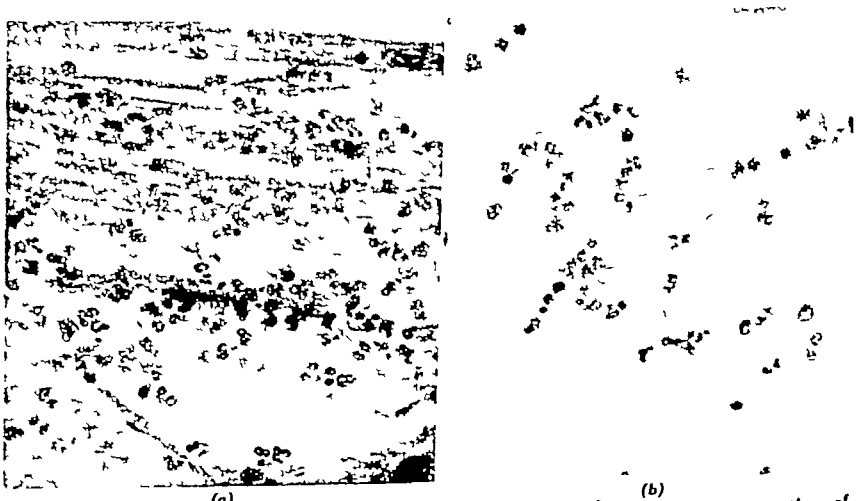
Viscosity Measurements

It is evident that the presence of fibrils confers a structural rigidity rather than a true solution viscosity on the sputum, rendering straightforward viscometry very difficult

Comparative measurements of the viscosity of the sputum samples were estimated on a modification of the ball viscosimeter described by Lucas and Henderson (1936), using 9 5 cm of a tube of bore 6 mm, and a ball bearing of 3 mm diameter (weight 2 0 g) or 0 25 ml of mercury (weight 3 4 g) As Lucas and Henderson found with saliva, the viscosity of sputum decreases with time after collection, rapidly at body temperature but appreciably at 5°C The decrease is presumably due to enzyme activity within the sample, and this made serial studies on fresh material from patients practically impossible. One spasm of coughing seldom produced sufficient for making estimations with the equipment described But controlled in vitro studies or mixed samples of relatively fresh sputum enabled significant differences to be detected

Inhalation Spray

The D N ase was made up in various strengths —0 05 mg and 0 5 mg per ml —in $M/50$ $MgCl_2$ with 1% gelatin, Seitz filtered and stored in 5 ml quantities at 5°C till used The lowest concentration was found too low for consistent clinical results, though a cytochemical effect was obtained The efficacy of the spray was demonstrated beforehand on fixed smears of cells The higher concentrations proved more satisfactory clinically The spraying apparatus was the commercially available 'Deedon,' modified to give a flow of vapour, through a 3 in glass tube of about 1 in diameter, directly into the mouth A flow of 6–8 litres a minute of 5% carbon dioxide and 95% oxygen was supplied through a T tube The other wing of the T was closed by the patient's thumb during inspiration and open during expiration, in the manner described by Barach (1945) In the



(a) (b)

Fig 2—Photomicrographs showing effect in-vitro of deoxyribonuclease on Feulgen reaction of purulent sputum (a) control sample after two hours incubation at 37 C showing many Feulgen positive fibrils and leucocytes; (b) sample of same sputum after action of deoxyribonuclease showing disappearance of Feulgen positive fibrils but persistence of intact cell nuclei (400)

clinical trials the inhalation spray was administered once only or three times a day for two or more days, to a maximum of eleven inhalations for any one patient in this study There was no contra indication to longer administration The enzyme was not inhibited by penicillin or streptomycin, in either the test tube experiments or the therapeutic spray as demonstrated cytochemically

RESULTS

Material from 15 patients has been studied In 8 patients the sputum was studied by in vitro experiments using the enzyme D N ase and suitable control solutions Clinical appraisal of the enzyme effect was attempted in 7 patients, D N ase being administered by inhalation spray to 6, and by intrapleural injection to 1

In Vitro

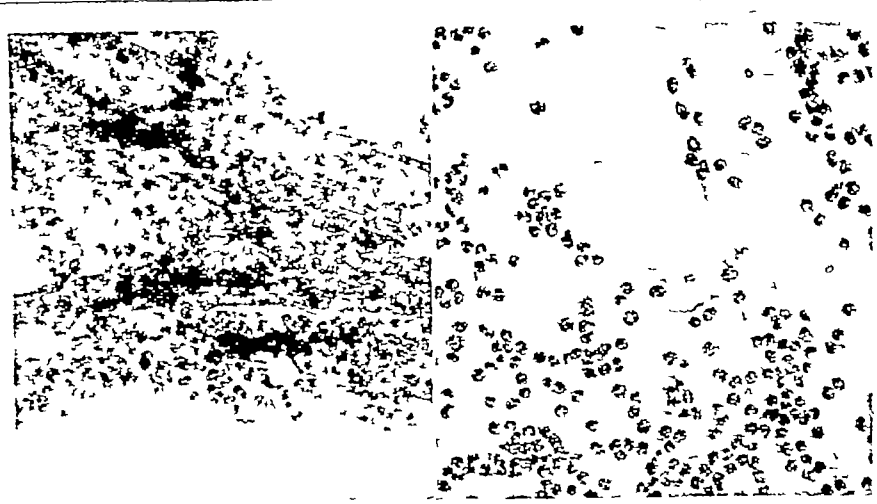
Fig 1 compares the appearance of purulent sputum (*a*) with mucinous non purulent sputum (*b*) Fibrils are seen as ropes and strands which give a positive reaction to the Feulgen stain in the purulent specimen Feulgen positive fibrils are not seen in the non purulent specimen though the cell nuclei, containing D N P are stained, and the cells are embedded in mucoprotein The effect of the enzyme D N ase on the fibrils after incubation for two hours at 37°C is shown in fig 2, and compared with a control sample In the enzyme treated specimen the Feulgen positive reaction of the fibrils has almost entirely disappeared, but the nuclei of many intact leucocytes have preserved their staining characteristics After incubation for two hours at 37°C the viscosity of the enzyme treated sputum was reduced to 27% of the control

In Vivo

Similar though not such extensive alterations in the fibrils were seen in the sputum samples obtained from 4 patients with purulent bronchitis, at suitable intervals after a single inhalation of 5 ml of the D N ase solution The lowest concentration (0 05 mg per ml) of enzyme was used first and found to have little clinical effect although there was demonstrable cytochemical change in the subsequent sputum The first change seen was a diffuseness and then slight granularity in the Feulgen stained fibrils Later the fibrils became fragmented, stained more weakly, and finally disappeared. In case 1 there were typical in vivo macroscopical and microscopical changes in the sputa after a single inhalation of D N ase Case 2 was a patient with empyema who was given two intrapleural injections of 0 25 mg of D N ase at an interval of forty eight hours

Case 1 —A man, aged 75, had worked as a miner until five years ago He had had fair health, except for a chronic cough and grey sputum for years A month before admission cough and sputum had become much worse, and associated with dyspnœa

Date	*Clinical data and therapy*	*Cytochemical findings in sputum*
Feb 6	Admitted with acute urinary retention Chest rhonchi throughout, rales at both bases posteriorly	—
Feb 14	Coughing up greenish purulent sputum 8–10 oz daily	—
12.30 P.M	Vital capacity 800 ml. D.N ase 0 25 mg by inhalation spray	*Control (before therapy)* 8 A.M. to 12 30 P M. a great many fine Feulgen positive fibrils
1 30 P M	Sputum slightly less viscid, no subjective change	Little change though some fibrils less discreet and Feulgen negative ground substance more evident
3 30 P.M	Sputum little change	Few Feulgen positive fibrils and these less discreet Feulgen negative ground substance increased and free cells more evident
Feb 15 8 45 A.M	Sputum easier to bring up during the night no visible change in character	Fibrils diffuse and weakly Feulgen positive back ground more cellular
4 45 P.M.	Respiration easier sputum readily brought up	Fibrils fragmented granular, and practically all Feulgen negative
Feb 16 8.30 A.M	Feels about same, no further change in sputum	Short irregular fibrils reappearing but not deeply Feulgen positive
Feb 17 9 00 A.M	Sputum more viscid but not to control levels vital capacity 1250 ml	Fibrils longer but not aligned in strands little ground substance

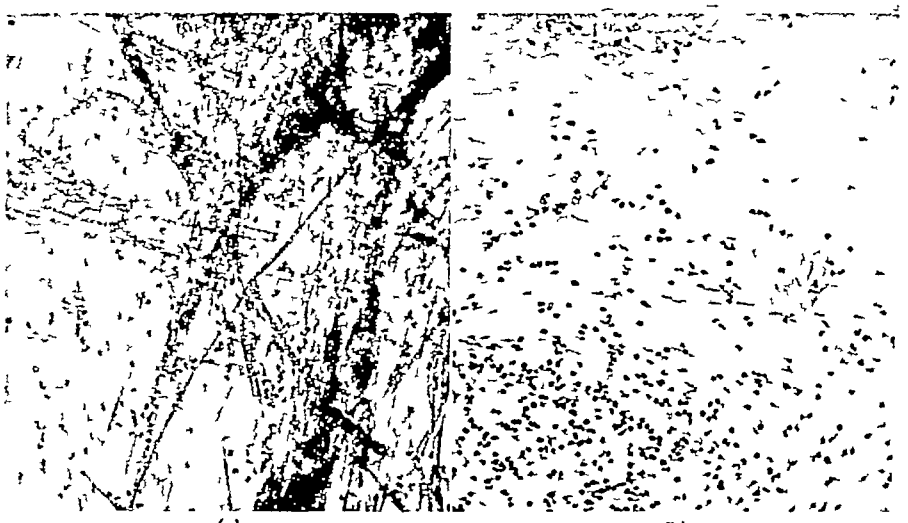


(a) (b)

Fig 3—Photomicrographs of Feulgen-stained sputum from a patient with bronchiectasis : (a) control specimen expectorated before inhalation of enzyme showing leucocytes entangled in thick ropes of Feulgen-positive fibrils (b) sputum expectorated the day after inhalation spray of deoxyribonuclease 5 mg showing disintegration and disappearance of Feulgen-positive fibrils with persistence of many free leucocytes (× 200)

Case 2 —A woman, aged 56, with two weeks history of severe malaise, weakness sweating cough with little sputum, and pain in the left side of the chest

Date	*Clinical data and therapy*	*Cytochemical findings in pleural exudate*
Jan 20	Admitted flushed and exhausted with dullness at left base radiography showed diffuse shadow in same area Penicillin L.M. 500 000 units daily until Jan 24 Aureomycin Jan 24–28	—
Jan. 30	Chest aspiration 60 ml. of thick tenacious greenish pus giving lactose fermenting coliform bacillus in culture Penicillin 500 000 units injected intrapleurally	Fine thin strands of Feulgen positive material between deeply stained nuclei of enmeshed cells
Jan 31	Chest aspiration 155 ml of thick ropy greenish exudate difficult to aspirate D.N ase 0 25 mg in 10 ml. of saline solution injected intrapleurally with penicillin 1 000 000 units	Appearances similar to above but Feulgen-negative ground substance slightly increased
Feb 1	Chest aspiration 140 ml of moderately thick smooth pus running more readily through the needle	Pus-cell nuclei still stain Feulgen positively fibrils thicker more diffuse and many fragmented
Feb 2	Chest aspiration 120 ml of free-flowing greenish exudate giving profuse growth of *Bacl coli* on culture D N ase 0 25 mg in 10 ml. of saline solution and penicillin 1 000 000 units injected intrapleurally	Fibrils infrequent, thin and discreet ground substance much more diffuse and cells relatively more numerous



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Cytochemical Tests

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The sputum samples were smeared on to glass slides and fixed while wet in Susa solution for an hour Wet preparations of blood cells or other test preparations were fixed in the same way In the in vitro experiments the slides were covered with test enzyme solution or control solution minus enzyme, and kept at room temperature, or at 37°C, for an hour or more Next they were washed and stained by the pyronin methyl green or Feulgen methods The latter is generally considered a highly specific cytochemical test for D N A (Feulgen and Rossenbeck 1924), and the former method gives a useful and reliable distinction between the two forms of nucleic acid (Brachet 1942)

In the Feulgen preparations of purulent sputa long fibrils of Feulgen positive material are to be seen running between the leucocytes and enmeshing them In comparative studies changes in the number and structure of these fibrils are readily appreciated on high power microscopy

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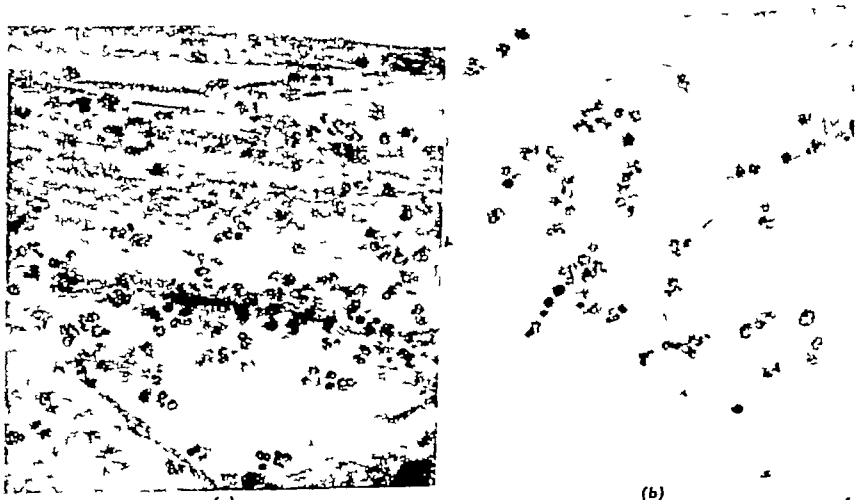
It is evident that the presence of fibrils confers a structural rigidity rather than a true solution viscosity on the sputum, rendering straightforward viscometry very difficult

Comparative measurements of the viscosity of the sputum samples were estimated on a modification of the ball viscosimeter described by Lucas and Henderson (1936), using 9 5 cm of a tube of bore 6 mm , and a ball bearing of 3 mm diameter (weight 2 0 g) or 0 25 ml of mercury (weight 3 4 g) As Lucas and Henderson found with saliva, the viscosity of sputum decreases with time after collection, rapidly at body-temperature but appreciably at 5°C The decrease is presumably due to enzyme activity within the sample, and this made serial studies on fresh material from patients practically impossible One spasm of coughing seldom produced sufficient for making estimations with the equipment described But controlled in vitro studies or mixed samples of relatively fresh sputum enabled significant differences to be detected

Inhalation Spray

The D N ase was made up in various strength —0 05 mg and 0 5 mg per ml —in *M*/50 $MgCl_2$ with 1% gelatin, Seitz filtered, and stored in 5 ml quantities at 5°C till used The lowest concentration was found too low for consistent clinical results, though a cytochemical effect was obtained The efficacy of the spray was demonstrated beforehand on fixed smears of cells The higher concentrations proved more satisfactory clinically The spraying apparatus was the commercially available 'Deedon,' modified to give a flow of vapour, through a 3 in glass tube of about 1 in diameter, directly into the mouth. A flow of 6–8 litres a minute of 5% carbon dioxide and 95% oxygen was supplied through a T tube The other wing of the T was closed by the patient's thumb during inspiration and open during expiration, in the manner described by Barach (1945) In the



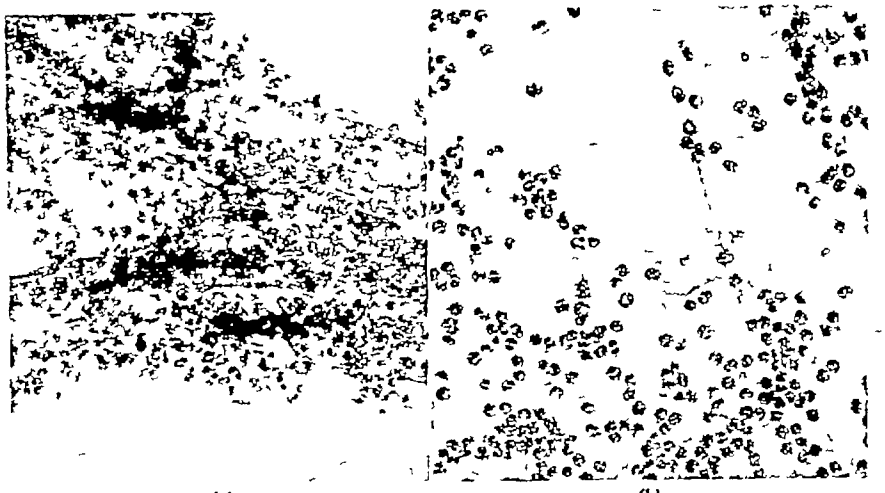
(a) (b)

Fig 2—Photomicrographs showing effect in-vitro of deoxyribonuclease on Feulgen reaction of purulent sputum (a) control sample after two hours incubation at 37 C showing many Feulgen-positive fibrils and leucocytes (b) sample of same sputum after action of deoxyribonuclease showing disappearance of Feulgen-positive fibrils but persistence of intact cell nuclei (× 400)

clinical trials the inhalation spray was administered once only or three times a day for two or more days, to a maximum of eleven inhalations for any one patient in this study There was no contra indication to longer administration The enzyme was not inhibited by penicillin or streptomycin, in either the test tube experiments or the therapeutic spray, as demonstrated cytochemically

RESULTS

Material from 15 patients has been studied In 8 patients the sputum was studied by in vitro experiments using the enzyme D N ase and suitable control solutions Clinical appraisal of the enzyme effect was attempted in 7 patients, D N ase being administered by inhalation spray to 6, and by intrapleural injection to 1



(a) (b)

Fig 3—Photomicrographs of Feulgen-stained sputum from a patient with bronchiectasis (a) control specimen expectorated before inhalation of enzyme showing leucocytes entangled in thick ropes of Feulgen-positive fibrils (b) sputum expectorated the day after inhalation spray of deoxyribonuclease 5 mg showing disintegration and disappearance of Feulgen positive fibrils with persistence of many free leucocytes (× 200)

In Vitro

Fig 1 compares the appearance of purulent sputum (*a*) with mucinous non purulent sputum (*b*) Fibrils are seen as ropes and strands which give a positive reaction to the Feulgen stain in the purulent specimen Feulgen positive fibrils are not seen in the non purulent specimen though the cell nuclei, containing D N P are stained, and the cells are embedded in mucoprotein The effect of the enzyme D N ase on the fibrils after incubation for two hours at 37°C is shown in fig 2, and compared with a control sample In the enzyme treated specimen the Feulgen positive reaction of the fibrils has almost entirely disappeared, but the nuclei of many intact leucocytes have preserved their staining characteristics After incubation for two hours at 37°C the viscosity of the enzyme treated sputum was reduced to 27% of the control

In Vivo

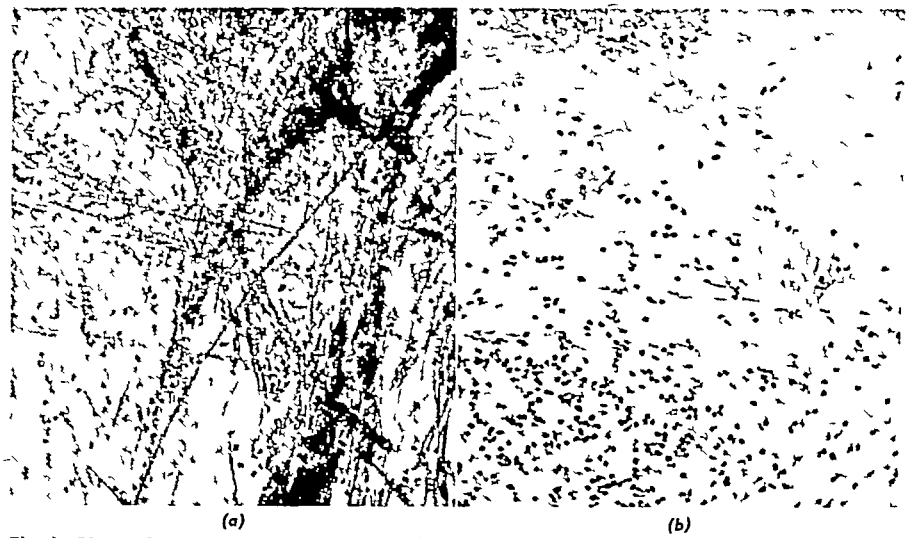
Similar though not such extensive alterations in the fibrils were seen in the sputum samples obtained from 4 patients with purulent bronchitis, at suitable intervals after a single inhalation of 5 ml of the D N ase solution The lowest concentration (0 05 mg per ml) of enzyme was used first and found to have little clinical effect, although there was demonstrable cytochemical change in the subsequent sputum The first change seen was a diffuseness and then slight granularity in the Feulgen stained fibrils Later the fibrils became fragmented, stained more weakly, and finally disappeared. In case 1 there were typical in vivo macroscopical and microscopical changes in the sputa after a single inhalation of D N ase Case 2 was a patient with empyema who was given two intrapleural injections of 0 25 mg of D N-ase at an interval of forty-eight hours

Case 1 —A man, aged 75 had worked as a miner until five years ago He had had fair health, except for a chronic cough and grey sputum for years A month before admission cough and sputum had become much worse and associated with dyspnœa

Date	*Clinical data and therapy*	*Cytochemical findings in sputum*
Feb 6	Admitted with acute urinary retention Chest rhonchi throughout, râles at both bases posteriorly	—
Feb 14	Coughing up greenish purulent sputum 8–10 oz daily	—
12.30 P M	Vital capacity 800 ml. D.N ase 0 25 mg by inhalation spray	*Control (before therapy)* 8 A.M. to 12 30 P M. a great many fine Feulgen positive fibrils
1 30 P M	Sputum slightly less viscid, no subjective change	Little change though some fibrils less discreet and Feulgen negative ground substance more evident
3.30 P.M.	Sputum little change	Few Feulgen positive fibrils and these less discreet Feulgen negative ground substance increased and free cells more evident
Feb 15 8 45 A.M	Sputum easier to bring up during the night no visible change in character	Fibrils diffuse and weakly Feulgen positive, background more cellular
4 45 P M.	Respiration easier sputum readily brought up	Fibrils fragmented granular, and practically all Feulgen negative
Feb 16 8 30 A M	Feels about same no further change in sputum	Short irregular fibrils reappearing but not deeply Feulgen positive
Feb 17 9 00 A.M	Sputum more viscid but not to control levels vital capacity 1250 ml	Fibrils longer but not aligned in strands little ground substance

Case 2 —A woman, aged 56, with two weeks history of severe malaise, weakness sweating cough with little sputum, and pain in the left side of the chest

Date	*Clinical data and therapy*	*Cytochemical findings in pleural exudate*
Jan 20	Admitted flushed and exhausted with dullness at left base radiography showed diffuse shadow in same area Penicillin I M 500 000 units daily until Jan 24 Aureomycin Jan.24–28	—
Jan. 30	Chest aspiration 60 ml of thick tenacious greenish pus giving lactose fermenting coliform bacillus in culture Penicillin 500 000 units injected intrapleurally	Fine thin strands of Feulgen positive material between deeply stained nuclei of enmeshed cells
Jan 31	Chest aspiration 155 ml of thick ropy greenish exudate difficult to aspirate D.N ase 0 25 mg in 10 ml of saline solution injected intrapleurally with penicillin 1 000 000 units	Appearances similar to above but Feulgen-negative ground substance slightly increased
Feb 1	Chest aspiration 140 ml of moderately thick smooth pus running more readily through the needle	Pus-cell nuclei still stain Feulgen positively fibrils thicker more diffuse and many fragmented
Feb 2	Chest aspiration 120 ml of free flowing greenish exudate giving profuse growth of *Bact coli* on culture D N ase 0 25 mg in 10 ml of saline solution and penicillin 1 000 000 units injected intrapleurally	Fibrils infrequent thin, and discreet ground substance much more diffuse and cells relatively more numerous



(a) (b)

Fig 1—Photomicrographs of sputum wet fixed in Susa solution and Feulgen-stained (a) purulent sputum showing Feulgen-positive fibrils arranged in strands and entangling leucocytes (b) non purulent mucinous sputum showing Feulgen reaction confined to nuclei of leucocytes which are embedded in muco protein (× 100)

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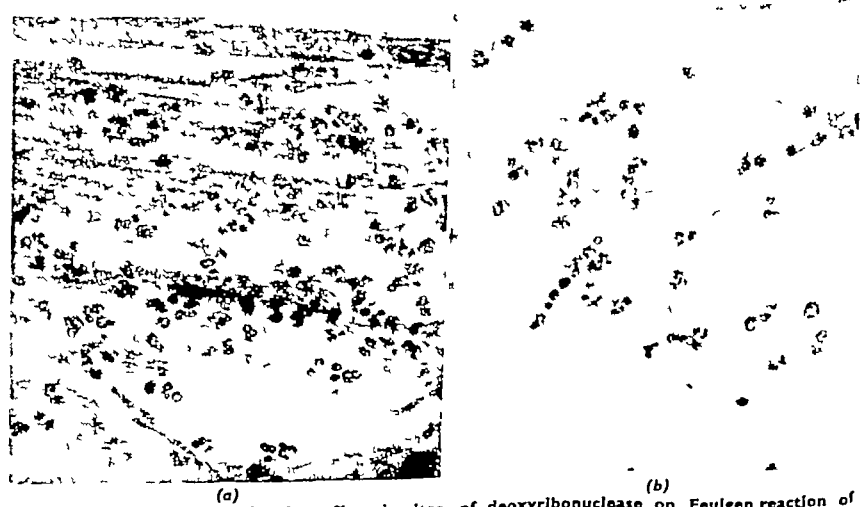

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according to age, are set out in table I, which shows that organic pathological conditions of the endometrium were found in 139 cases

Though most workers restrict the use of the term functional uterine hæmorrhage" to cases of abnormal bleeding in the absence of any palpable lesion of the reproductive organs, it is occasionally used in a different sense Béclère (1934, 1938a b, and c) and Huffman (1942) speak of functional bleeding due to genital infection Brewer and Jones (1948) say that hæmorrhage can occur irrespective of the presence or absence of gross pelvic disease, and that the ovarian and endometrial changes are the same in either case

PRESENT SERIES

To investigate further the above mentioned statement of Brewer and Jones (1948) in so far as the endometrial histology is concerned, an analysis was made of the clinical and histological findings in 1000 cases of abnormal uterine bleeding in the presence of palpable disease of the pelvic organs which might explain it These patients were treated in the Royal Samaritan Hospital for Women between Oct 1, 1937, and April 19, 1949 It was impossible to obtain an absolutely consecutive series of cases, because in a few instances the clinical records were incomplete or missing The information available was insufficient to enable an assessment to be made of the part played by such general conditions as blood dyscrasia in causing the bleeding in these patients The following cases were specifically excluded from the series all types of abortion, all cases in which the only pelvic abnormality present was slight symmetrical uterine enlargement or slight cystic enlargement of one ovary, and all cases of bleeding after the menopause

Organic pelvic lesions were present in every case, the diagnosis being confirmed histologically in most of them The details were as follows

Lesion	*No of cases*
Uterine fibroids irrespective of size and position	830
Chronic salpingitis or salpingo-oöphoritis	141
Adenomyosis of uterus	35
Chronic parametritis mainly of slight degree	27
Endometriomas of one or both ovaries	26
Ovarian neoplasms of various types	19

HISTOLOGICAL MATERIAL

The material available for histological examination consisted of the uterus in 628 cases, and of curettings in the remaining 372 No attempt was made in any instance to obtain endometrium at any particular time in the menstrual cycle, the patients being admitted to the hospital from the waiting list in the usual way and undergoing operation as soon as possible after admission Though more information might have been obtained if it had been possible to choose the time of securing specimens, it will be shown that even in such a series, routine histological examination of the endometrium is desirable, irrespective of age

HISTOLOGICAL FINDINGS

The details of the endometrial histology, arranged according to age, are shown in table II. For purposes of comparison each category in tables I and II will be discussed in turn, the cases in table I being referred to as the "functional" group and the cases in table II as the "organic" In comparing these series it should be noted that table I deals with an age group more than fifteen years younger than that in table II, and it is likely that this factor plays some part in the differences between the two It would also have been interesting to have a control series of the endometrial findings in healthy women without abnormal uterine bleeding, but this proved impracticable

Chronic Endometritis

In the "organic" cases chronic endometritis was found 40 times (4%), compared with 110 cases (11%)

TABLE I—ENDOMETRIAL HISTOLOGY IN 1000 CASES OF ABNORMAL UTERINE BLEEDING IN THE ABSENCE OF GROSS PELVIC DISEASE

Age (years)	No of cases	Chronic endometritis	Uterine polyp	Tuberculosis	Malignant disease	Hyperplasia	Atrophy	Irregular shedding	Irregular ripening	No apparent abnormality
20 or less	36	2	0	1	0	9	0	0	0	24
21–30	242	40	3	5	0	22	0	1	6	165
31–40	343	41	4	1	2	82	3	3	10	197
41–50	362	27	2	3	5	145	5	9	10	156
Over 50	17	0	2	0	1	7	2	0	0	5
Total	1000	110	11	10	8	265	10	13	26	547

in the "functional" series The endometritis was invariably interstitial and was diagnosed only when the endometrial stroma showed appreciable infiltration with lymphocytes and plasma cells Of the 40 patients 15 gave no history of pregnancy The following histological pictures were seen

	No of cases
Endometrium in proliferative phase of cycle	23
Endometrium in secretory phase of cycle	6
Endometrial hyperplasia	7
Irregular ripening of endometrium	3
Endometrial atrophy	1

The relatively high incidence of chronic endometritis in the "functional" cases is of interest In view of the fact that chronic salpingitis or salpingo oöphoritis occurred in 141 of the "organic" cases and chronic parametritis in 27, one might reasonably expect a high incidence of endometritis in these conditions In the 40 cases under review chronic adnexal infection occurred 17 times and chronic parametritis once

Uterine Polypi

Uterine polypi were discovered in 18 cases in the "organic" group (1 8%) In 16 instances the polypi were of the mucous endometrial type and in the remaining cases fibroid polypi were found Uterine fibroids were present in all 18 cases This figure of 1 8% does not differ significantly from that of 1 1% found in the "functional" series

Endometrial Tuberculosis

In a previous communication (Sutherland 1943) unsuspected tuberculosis of the endometrium is discussed in detail and the published reports on tuberculosis of the uterus are reviewed. Of 58 cases of uterine tuberculosis 34 were apparently limited to the uterine body and showed no evidence of involvement of other pelvic structures on clinical examination In 9 of these 34 cases the principal complaint was profuse and sometimes irregular bleeding The occurrence of endometrial tuberculosis on 9 occasions in the "organic" series (0 9%) is essentially similar to that found in the "functional" group (1 0%) Of the 9 patients 8 were nulliparous, and the 9th had had a miscarriage Adnexal thickening was noted in 6 of the 9 cases

TABLE II—ENDOMETRIAL HISTOLOGY IN 1000 CASES OF ABNORMAL UTERINE BLEEDING IN THE PRESENCE OF GROSS PELVIC DISEASE

Age (years)	No of cases	Chronic endometritis	Uterine polyp	Tuberculosis	Malignant disease	Hyperplasia	Atrophy	Irregular shedding	Irregular ripening	No apparent abnormality
20 or less	7	2	0	2	0	1	0	0	0	2
21–30	75	11	0	1	0	7	1	0	0	55
31–40	306	14	6	4	5	36	12	0	6	223
41–50	529	11	9	2	12	124	33	0	8	330
Over 50	83	2	3	0	6	27	3	0	4	38
Total	1000	40	18	9	23	195	49	0	18	648

Feb 4	Chest aspiration 170 ml of watery green fluid Penicillin 1,000,000 units injected intrapleurally	Cells still in strands, but fibrils granular thick and diffuse
Feb 6	Chest aspiration 150 ml of watery green fluid	Strands very diffuse, no fibrils, cells degenerating
Feb 7	Chest aspiration 30 ml of watery green fluid	A few fibrils less ground substance cells more numerous
Feb 10	Operation rib resected and fluid purulent exudate removed visceral pleura unusually thin	

Subsequent clinical studies were made on two young bronchiectatic patients, the enzyme being used in a concentration of 0 5 mg per ml and a dosage of 10 ml a day (5 0 mg of D N ase a day) divided into three doses In one case given full dosage from the start there was subjective improvement, the patient said he could walk up two flights of stairs, without stopping, for the first time in the last three years of his thirteen years of bronchiectasis He also stated that he slept better, breathed more easily on awakening, and brought up his sputum more readily, and that his chest felt lighter This improvement took place coincidentally with the administration of the enzyme, whereas 100,000 units of penicillin had been given by the same route daily for nine days without producing any improvement and had been stopped five days before the exhibition of the enzyme The quantity of sputum expectorated increased the day after the first enzyme inhalation, and then decreased Cytochemical changes were evident the day after the first inhalation and are shown in fig 3 They were still present during the subsequent week, though gradual return of thick strands was evident by the sixth day after the last inhalation Similar cytochemical changes were observed in the second bronchiectatic patient, who was started on the lower dosage and showed less clinical effect

Endotracheal injection by the oral catheter technique (as used for lipiodol) was done on two occasions, with the cooperation of Dr D G James, but without demonstrable beneficial effect

None of the patients to whom D N ase was given by any of several routes showed symptoms of toxicity, and no febrile reactions occurred The bacterial flora cultured from the purulent sputa were all organisms commonly inhabiting the upper respiratory tract, with predominance of *Strep viridans*, in one case only was a group A hæmolytic streptococcus found

DISCUSSION

The findings of Sherry et al (1948, 1949) and Tillett et al (1948, 1949, 1950) on the importance of D N P in viscid purulent materials, and the action of D N ase on these, are substantiated A few in vivo studies suggest a rapid action and a long lasting effect of ox pancreas D N ase on purulent material within the human chest The administration of the enzyme by inhalation spray may prove a useful adjunct to antibiotic therapy of acute and particularly of chronic bronchial inflammatory diseases that are so prevalent in this country D N ase might prove also to be of some value in other purulent conditions, such as chronic sinusitis, otitis media, cystitis, and so forth, though we have not explored these possibilities

The enzyme, which is specific in attacking only D N A, seems to be antigenic in the rabbit, but no sensitivity reactions were observed in patients in whom there were intervals of from four days to a month between courses of inhalation of the D N ase This enzyme has no effect on true mucinous sputum, such as commonly arises in asthmatic patients The preparation had no more than a trace of residual proteolytic or fibrinolytic activity

SUMMARY

Some of the cytochemical characteristics of viscous purulent sputum are described, deoxyribonucleoprotein fibrils being an important constituent

Treatment of such sputum with deoxyribonuclease an enzyme isolated from ox pancreas, reduced the number of these fibrils and made the sputum less viscous

A method of spray inhalation of this enzyme is described for patients with chronic chest infection Clinical benefit was obtained with repeated inhalations containing 5 mg of deoxyribonuclease a day

No toxic or anaphylactic reaction was encountered in the clinical studies

We are indebted to Prof J McMichael, Dr J G Scadding, and other colleagues for permission to study their patients, Prof J H Dible and Prof J N Davidson for advice and criticism, Mr L H Turnbull for technical help with the Feulgen staining, and Mr K G Moreman, A.B.P.S., for the photomicrographs

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HISTOLOGY OF THE ENDOMETRIUM IN "ORGANIC UTERINE HÆMORRHAGE"

ARTHUR M SUTHERLAND,
M D Glasg, F R F P S, M R C O G
ASSISTANT SURGEON, ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW

IN recent years there have been many publications on functional uterine hæmorrhage, or dysfunctional uterine hæmorrhage, as it is sometimes called These terms are usually applied to cases of abnormal uterine bleeding which is not explained by any palpable lesion of the reproductive organs Smith (1944) regards the use of the word "functional" as an admission of ignorance of the true cause of the bleeding

I have already reviewed the recent literature of this subject (Sutherland 1949b) and have considered in some detail the histology of the endometrium in functional bleeding (Sutherland 1949a) I analysed the histological findings in the endometrium in 1000 cases of abnormal uterine bleeding in the absence of gross pelvic disease, all types of abortion and all patients with bleeding after the menopause being excluded The results, arranged

SUMMARY

An analysis was made of the histological findings in the endometrium in 1000 cases of abnormal uterine bleeding in the presence of gross pelvic disease which might explain it All patients with postmenopausal bleeding and all types of abortion were excluded

In 90 cases organic pathological lesions of the endometrium were found. Chronic endometritis occurred in 40 cases, uterine polypi in 18, tuberculosis in 9 malignant disease in 23 In the remaining 910 cases no organic pathological conditions of the endometrium were found. Endometrial hyperplasia occurred 195 times, endometrial atrophy 49 times, and irregular ripening of the endometrium 18 times The remaining 648 specimens appeared normal.

These findings, considered in conjunction with those of a previous series of 1000 cases in which there was abnormal uterine bleeding but no gross pelvic disease, demonstrate the necessity for routine histological examination of the endometrium in *all* cases of abnormal uterine bleeding, whatever the patient's age.

I wish to thank Prof T Ferguson for his helpful criticism and advice regarding the statistical aspect of this paper, and Drs D McIntyre J Hewitt, and W Clement for permission to study case records from their files

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Preliminary Communication

BACTERIAL POLYSACCHARIDES IN THE DIAGNOSIS OF INFECTIONS

THE POLYSACCHARIDE LYSIS TEST

A NEW field in laboratory technique has been opened by the demonstration of Middlebrook and Dubos (1948) that adsorption of a heat-stable polysaccharide fraction of *Mycobacterium tuberculosis* H37RV on sheep erythrocytes renders them specifically agglutinable by sera from immunised animals or from patients with active tuberculosis. Scott and Smith (1950) showed that equivalent results could be obtained with Old Tuberculin as the sensitising agent but the use of a hæmagglutinating system inevitably leads to anomalous results from the occasional presence of heterophil antibodies. Keogh et al (1948) and Fisher and Keogh (1950) showed that the addition of complement to the reacting system caused specific hæmolysis This reaction, which we call the polysaccharide lysis test (P L T) seemed to us to be applicable to various infections and we have prepared satisfactory active fractions from the salmonellæ (modifying the Widal reaction) from *Proteus* (modifying the Weil Felix reaction), *Neisseria gonorrhœæ* (superseding the gonococcal complement fixation test) and *Myco tuberculosis* The use of *S typhi* O polysaccharide in the diagnosis of typhoid fever is described elsewhere by Thomas and Mennie (1950), and the use of *Proteus X* K OXK polysaccharide in the diagnosis of scrub-typhus has been described by O Connor and MacDonald (1950) We are here briefly reporting our results to date with particular reference to tuberculosis and gonorrhœa; full details will be published elsewhere

METHODS

The selection of sheep cells for the reacting system is arbitrary and conditioned by their availability and ease of storage in 5% sodium citrate (Evans 1950) Preliminary absorption of the test serum (30 minutes at room-temperature) is necessary to remove heterophil antibodies but this has not proved an obstacle in practice Theoretically, Forssman deficient rabbit cells are the ideal Experiments with *S typhi* polysaccharide showed no differences in titre between sensitised human group O cde/cde sheep rabbit, chicken, or guineapig erythrocytes

Inactivated sera after absorption with untreated sheep cells are set up in serial doubling dilutions of 0 25 ml unit volume in 3 ½ in tubes. To each is added 1 vol. of sensitised cell suspension and 2 vol. of complement containing 1 Kolmer unit Appropriate controls (serum + untreated cells, sensitised cells — complement sensitised cells — saline, known positive and negative sera in full) are set up and the whole incubated for 1 hr at 37°C The end point is taken as the highest dilution showing sparkling hæmolysis (titres given are reciprocals of the original and not the true final serum dilution)

Sensitised cells are prepared by treating packed washed sheep cells with 10 vol. of 0 1% polysaccharide in saline solution for 2 hr at 37°C washing three times with saline and resuspending to 0 5% concentration in saline solution With the defined reacting system no differences were noted between 0 5, 1 and 2% suspensions the first was selected as conserving polysaccharide Sensitised cells seem to be more stable than untreated cells suspensions remaining potent and unhæmolysed for a week or more at 20°C The 0 1% polysaccharide concentration is arbitrary, but that of *N gonorrhœæ* requires to be of this order, *S typhi* O polysaccharide is active in dilutions of 1 × 10^{-5} Cells sensitised with gonococcal polysaccharide show a relatively rapid loss of sensitivity and when tested against the same serum, may show a fourfold to eightfold reduction of titre in 3 or 4 days Per contra this may be due to instability of the natural antibody and the point, being of practical importance, required further investigation

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Both these methods yield a pure dry polysaccharide which can be used quantitatively Method V gave maximal yields and seems to be that of choice for large-scale production

VI. Alkaline hydrolysis (N 4 NaOH) for 6 hr at 56°C of a heavy suspension or dense fluid culture and precipitation with 68% v v ethanol. The polysaccharide is allowed to precipitate overnight at 2 C collected by centrifugation, and either acetone-dried for storage or used directly

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Malignant Disease of Uterus

There were 23 cases of malignant disease of the uterus in the "organic" series (2 3%) as compared with 8 examples in the "functional" group (0 8%) Possibly the rather higher incidence in the "organic" series is due, in part at least, to the larger numbers of patients in the later age groups in that series As would be expected, all 23 patients were in the higher age groups, the youngest being aged thirty-two Carcinoma of the uterine body occurred in 19 cases, including the patient aged thirty-two, and sarcoma was found in the remainder Uterine fibroids were present in all 23 cases, and 1, in addition, had bilateral ovarian carcinoma These figures indicate the desirability of histological examination of the endometrium in all cases of fibroids with abnormal uterine bleeding, of 830 patients with fibroids in the present series 23 had malignant disease of the endometrium (2 8%) According to Novak (1947) the presence of fibroids may possibly predispose to the development of adenocarcinoma of the uterine body Kelly and Cullen (1909) found 25 examples of adenocarcinoma in "over 1400 cases of myomatous uteri" McDonald (cited by Novak 1947) found 20 cases of adenocarcinoma in 700 cases of myoma, and similar figures are reported by Stewart (cited by Novak 1947) These findings are in reasonable agreement with those in the present group of cases

Endometrial Hyperplasia

The extensive literature on cystic glandular hyperplasia of the endometrium has already been reviewed (Sutherland 1949a), and it has been pointed out that great differences of opinion exist about the incidence of this condition, and that these differences may, to some extent, be due to different conceptions of what constitutes endometrial hyperplasia In the present cases endometrial hyperplasia was found on 195 occasions (19 5%), as compared with 265 in the "functional" series (26 5%) Among these 195 cases uterine fibroids were found in 168, chronic pelvic infection in 19, adenomyoma of uterus in 10, endometrioma of ovary in 3, and ovarian neoplasm in 3

Endometrial Atrophy

A study of the literature of endometrial atrophy in relation to functional uterine bleeding (Sutherland 1949a) shows that opinions differ widely on this condition In the present cases the term is applied only where the endometrium was thin and scanty, with infrequent inactive glands, or where the amount of tissue was so small as to make accurate description impossible The incidence of atrophy in the "organic" cases was 4 9%, as compared with 1% in the "functional" group In these 49 cases uterine fibroids were present in 44 instances, adnexal infection in 4, ovarian neoplasm in 2, adenomyoma of uterus in 1, and endometrioma of ovary in 1 Most of these cases occured in the later age groups The appreciably higher incidence of atrophy in the "organic" group may be due to the association with uterine fibroids in most cases

Irregular Shedding of Endometrium

The literature of this condition is discussed in an earlier communication (Sutherland 1949a) According to Holmstrom and McLennan (1947) the phrase "irregular shedding of the endometrium" is used to indicate a specific type of functional uterine bleeding which is characterised by prolongation of cyclic menstrual bleeding from progestational endometrium and often, in addition, by an increase in the amount of bleeding The diagnosis is suggested by the typical clinical history of regularly recurring menorrhagia and is substantiated if secretory endometrium is obtained by curettage during the long continued bleeding, well beyond the time when endometrial regeneration would normally have occurred They state that, for diagnosis, the patient must be curetted on the fifth or sixth day of the menstrual period, since endometrium obtained on the first day of the period in a normal woman will show many of the characteristics of irregular shedding

In the "functional cases" irregular shedding was found on 13 occasions (1 3%) Probably, however, the true incidence of irregular shedding in such cases is appreciably higher, since relatively few of these patients were curetted during a spell of bleeding The figures from the literature (Sutherland 1949a) support this suggestion In the "organic" cases no examples of irregular shedding were found, but it is impossible to draw any conclusions about the incidence of this condition in view of the fact that these patients were very rarely operated on during the bleeding

Irregular Ripening of Endometrium

This condition has a relatively scanty literature (Sutherland 1949a) It represents a mixture of the proliferative and secretory phases of the menstrual cycle. On histological examination the peripheral zone of the endometrium shows considerable areas which are definitely non secretory and others which are definitely secretory in appearance In some cases the non secretory elements predominate, and in others the distribution is more patchy To make such a diagnosis histologically, these changes must be observed in the functional layer of the endometrium, and a considerable number of glands must be involved

In the "organic" cases irregular ripening was found on 18 occasions (1 8%) This figure is in reasonable agreement with that of 2 6% in the "functional" series. In these 18 cases fibroids were present in 13, chronic pelvic infection in 5, and adenomyoma in 1 Possibly a higher figure might have been obtained if routine examination of the endometrium in the premenstrual phase of the cycle had been carried out

Normal Endometrium

The endometrium did not show any histological abnormality in 648 of the "organic" group (64 8%), as compared with 547 in the "functional" cases (54 7%) Secretory changes were seen in 253 of the "organic" series and 263 of the "functional" group The remaining specimens in each category were in the proliferative phase of the cycle Probably a higher incidence of secretory endometria would have been found in either group if it had been feasible to obtain endometrium towards the end of the cycle in every case From the information available it is impossible to estimate the number of patients with anovulatory bleeding in these groups

CONCLUSIONS FROM HISTOLOGICAL FINDINGS

Evidence has been put forward to show that it is desirable to examine the endometrium histologically in all cases of abnormal uterine bleeding even if there is some pelvic disease which might explain the bleeding By doing so unsuspected organic conditions of the endometrium can be discovered The histological findings described here show that the endometrial patterns in "organic uterine bleeding" are essentially similar to those in "functional" cases, the only striking difference being in the incidence of chronic endometritis It is impossible to say how often the associated gross pelvic disease is responsible for the abnormal bleeding in such cases Though the bleeding often ceases after the presumed causal condition has been removed, many patients with fibroids, salpingo oöphoritis, and other gross pelvic lesions have normal menstrual cycles The figures given here suggest that too much emphasis may previously have been laid on the importance of the endometrial histological appearance in functional uterine hæmorrhage

SUMMARY

An analysis was made of the histological findings in the endometrium in 1000 cases of abnormal uterine bleeding in the presence of gross pelvic disease which might explain it All patients with postmenopausal bleeding and all types of abortion were excluded

In 90 cases organic pathological lesions of the endometrium were found Chronic endometritis occurred in 40 cases, uterine polypi in 18, tuberculosis in 9 malignant disease in 23 In the remaining 910 cases no organic pathological conditions of the endometrium were found Endometrial hyperplasia occurred 195 times, endometrial atrophy 49 times, and irregular ripening of the endometrium 18 times The remaining 648 specimens appeared normal.

These findings, considered in conjunction with those of a previous series of 1000 cases in which there was abnormal uterine bleeding but no gross pelvic disease, demonstrate the necessity for routine histological examination of the endometrium in *all* cases of abnormal uterine bleeding, whatever the patient's age.

I wish to thank Prof T Ferguson for his helpful criticism and advice regarding the statistical aspect of this paper, and Drs. D McIntyre, J Hewitt, and W Clement for permission to study case records from their files

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Preliminary Communication

BACTERIAL POLYSACCHARIDES IN THE DIAGNOSIS OF INFECTIONS

THE POLYSACCHARIDE LYSIS TEST

A NEW field in laboratory technique has been opened by the demonstration of Middlebrook and Dubos (1948) that adsorption of a heat stable polysaccharide fraction of *Mycobacterium tuberculosis* H37RV on sheep erythrocytes renders them specifically agglutinable by sera from immunised animals or from patients with active tuberculosis Scott and Smith (1950) showed that equivalent results could be obtained with Old Tuberculin as the sensitising agent, but the use of a hæmagglutinating system inevitably leads to anomalous results from the occasional presence of heterophil antibodies Keogh et al (1948) and Fisher and Keogh (1950) showed that the addition of complement to the reacting system caused specific hæmolysis This reaction, which we call the polysaccharide lysis test (P L.T), seemed to us to be applicable to various infections, and we have prepared satisfactory active fractions from the salmonellæ (modifying the Widal reaction), from *Proteus* (modifying the Weil Felix reaction), *Neisseria gonorrhœæ* (superseding the gonococcal complement fixation test), and *Myco tuberculosis* The use of *S typhi* O polysaccharide in the diagnosis of typhoid fever is described elsewhere by Thomas and Mennie (1950), and the use of *Proteus X* K OXK polysaccharide in the diagnosis of scrub typhus has been described by O'Connor and MacDonald (1950) We are here briefly reporting our results to date, with particular reference to tuberculosis and gonorrhœa, full details will be published elsewhere

METHODS

The selection of sheep cells for the reacting system is arbitrary and conditioned by their availability and ease of storage in 5% sodium citrate (Evans 1950) Preliminary absorption of the test serum (30 minutes at room temperature) is necessary to remove heterophil antibodies, but this has not proved an obstacle in practice Theoretically, Forssman deficient rabbit cells are the ideal Experiments with *S typhi* polysaccharide showed no differences in titre between sensitised human group O cde/cde, sheep, rabbit, chicken, or guineapig erythrocytes

Inactivated sera, after absorption with untreated sheep cells, are set up in serial doubling dilutions of 0 25 ml unit volume in 3 × 1/2 in tubes To each is added 1 vol of sensitised cell suspension and 2 vol of complement containing 1 Kolmer unit Appropriate controls (serum + untreated cells, sensitised cells + complement, sensitised cells + saline, known positive and negative sera in full) are set up and the whole incubated for 1 hr at 37°C The end point is taken as the highest dilution showing sparkling hæmolysis (titres given are reciprocals of the original and not the true final serum dilution)

Sensitised cells are prepared by treating packed washed sheep cells with 10 vol of 0 1% polysaccharide in saline solution for 2 hr at 37°C, washing three times with saline, and resuspending to 0 5% concentration in saline solution With the defined reacting system no differences were noted between 0 5, 1, and 2% suspensions, the first was selected as conserving polysaccharide Sensitised cells seem to be more stable than untreated cells, suspensions remaining potent and unhæmolysed for a week or more at 20°C The 0 1% polysaccharide concentration is arbitrary, but that of *N gonorrhœæ* requires to be of this order, *S typhi* O polysaccharide is active in dilutions of 1×10^{-5} Cells sensitised with gonococcal polysaccharide show a relatively rapid loss of sensitivity and, when tested against the same serum, may show a fourfold to eightfold reduction of titre in 3 or 4 days Per contra this may be due to instability of the natural antibody and the point, being of practical importance, required further investigation

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I Rapid freezing (dry ice-alcohol) and thawing (56°C) twenty times

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III Treatment of similar suspensions with the lytic product of *Streptomyces albus* (Maxted 1948)

These methods yield a polysaccharide containing supernatant fluid which may be used directly for sensitisation

IV Precipitation of the F68 polysaccharide by 68% *v/v* ethanol from ice cold trichloro acetic acid extracts of acetone dried bacterial bodies (Boivin et al 1933), the product is purified by dialysis and dried in vacuo from acetone

V Ethanol precipitation from an alkaline hydrolysate (N/4 NaOH) of large volume (10 litres) 10-day broth cultures (Ashenburg et al 1950) The crude precipitate is purified from solution in 0·1*M* sodium acetate/acetic acid buffer (pH 4 8) by repeated extractions with a chloroform *n* butanol mixture, reprecipitated with 1 5 vol of ethanol and dried in vacuo from acetone

Both these methods yield a pure dry polysaccharide which can be used quantitatively Method V gave maximal yields and seems to be that of choice for large scale production

VI Alkaline hydrolysis (N/4 NaOH) for 6 hr at 56°C of a heavy suspension or dense fluid culture and precipitation with 68% *v/v* ethanol The polysaccharide is allowed to precipitate overnight at 2°C collected by centrifugation, and either acetone dried for storage or used directly

A single experiment of note was the preparation of the pure FX flagellar antigen *d* of *S typhi* from the cells of a

formolised broth culture (250 ml) by extraction with 10% diethylene dioxide and precipitation as a filmy cloud by half saturation with $(NH_4)SO_4$ (Jenkins 1946) The precipitate taken up in saline solution gave a precipitin reaction to titre with *S typhi* H serum and a P L T to titre with the same serum when adsorbed on to sheep cells The interest lies in the fact that the antigen is a pure protein

TUBERCULOSIS

The observations of Middlebrook and Dubos (1948) have been confirmed by the P L T in tuberculosis with a tuberculo polysaccharide prepared from Old Tuberculin (supplied by Messrs Burroughs Wellcome & Co) by dialysis against running water for 18 hr followed by frequent changes of distilled water for 18 hr The dialysate was concentrated to a quarter of its original volume in vacuo and adjusted to pH 7 2 before use as a direct sensitising agent Further work on the extraction of active fractions from both the bacterial bodies and the substrate of fluid cultures of the H37Rv strain is in progress

A preliminary series of 50 sera from persons with no history of either tuberculous or gonococcal infection gave uniformly negative results A similar series was then provided by Dr A M Beemer, of King George V and Springfield Hospitals for Tuberculosis, Durban, from patients with both positive and negative sputum tests In every case of active disease the P L T was positive, the titres ranging from 6 to 64 The results in negative sputum cases were variable, and the clinical assessment of the test and the relations between the P L T titre and the stage of activity of the disease have yet to be determined, this will depend on the large scale production of the polysaccharide Moreover the multiple polysaccharide complexes of the tubercle bacillus require further investigation, the isolation of serologically active but distinct fractions from the human and bovine strains which could be adapted to this technique would represent a distinct diagnostic advance

The specific neutralising action of the tuberculo polysaccharide was demonstrated by fixing equal volumes of dialysed tuberculin and positive serum for 1 hr at 37°C Hæmolysis did not take place on the subsequent addition of sensitised cells and complement

GONORRHŒA

Serologically active fractions were obtained from *N gonorrhœa* by methods I, II, and VI, first from a pooled batch of time expired gonococcal vaccine, and subsequently from the parent vaccine strains Rietfontein 1 and 4, supplied by Dr D Ordman, of the South African Institute for Medical Research, and from a local strain, W190 The vaccine yield was adequate but low, partial extraction and degradation of the polysaccharide had taken place during 28 months' storage in 0 5% phenol, as shown by the fact that an inactive polysaccharide fraction could be precipitated from the supernatant fluid Since at least two serological strains exist, determined by specific polysaccharides (Casper 1937), it is desirable, for practical purposes, to use mixed strains for preparing active extracts Any solid medium supporting prolific growth is suitable, we have used dextrose starch agar and are now investigating a supplemented papain digest broth (modified from Le Minor 1948) for large scale production by method V

Our purpose was to investigate the possibility of substituting the P L T for the gonococcal complement fixation test, which presents a number of difficulties apart from that of interpretation, chief among which are the low titres to which antibodies are demonstrable in serum, the relative instability of the antigen, and the frequency of anticomplementary reactions A preliminary series of controls (same sera as for tubercle P L T) gave uniformly negative results Sera from both acute and chronic cases were then tested in parallel with the complement fixation test With one exception the results of both tests were negative in acute cases, the one case was in an African with an acute infection (which may have been superimposed on an older one) whose complement fixation test was negative and P.L T positive to a titre of 8 Of ten chronic cases the complement fixation test was anticomplementary in 1, the remaining serum titres being 1/1–4, 1/2–4, and 1/4–1 The P L.T was positive in all the cases, the titres being 1/4–5 (of which three were not taken to end titre), 1/8–3, and 1/64–1 The P L T was negative in a series of cases of non specific urethritis

The specificity of the two tests seems to be of the same order, with the balance slightly in favour of the P.L T, the sensitivity of the latter is demonstrably greater, P L T titres being from 4 to 16 times as high as those shown by the complement fixation test Moreover, the P L T, using a specific polysaccharide quantitatively in a pure form, overcomes the vagaries of a bacterial antigen and its standardisation, eliminates its frequent anticomplementary action, and, so far as we can determine, allows the test to be made on mildly hæmolysed sera which vitiate the complement fixation test For these reasons we believe that the P I T should supersede the complement fixation test as a diagnostic test

COMMENTS

The principle of the P L T is probably applicable to any condition in which serum antibodies are formed in response to an infecting agent from which a specific active fraction can be extracted—e g, tularæmia polysaccharide hæmagglutination test (Alexander et al. 1950) Apart from bacterial infections, the rickettsial, spirochætal, and protozoan infections would probably repay immediate study

The underlying mechanism of the test also requires study Although many bacterial polysaccharides have been shown to be capable of adsorption on to erythrocytes as well as pure protein fractions, not all serologically active polysaccharide complexes are so adsorbable—e g, the polysaccharide blood group A complex cannot be adsorbed on to human group O erythrocytes Nor can all active fractions be adsorbed on to all types of cell, those of *Pfeiferella mallei* can be adsorbed on to human, horse, sheep, guineapig, and chicken cells but not on to ox or pig cells, and differences in the amount of active principle required to sensitise different species exist (Boyden 1950)

Since this paper was written, Adler (1950) has reported a specific hæmolysis of this type with *S typhi* O-901 polysaccharide and rabbit immune serum, using sheep, rabbit, and human erythrocytes

JOHN C THOMAS M R C S
A T MENNIE M B Aberd

With the technical assistance of G W WIKELY

Central Pathological Laboratory
Natal South Africa

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Reviews of Books

The Breast

Structure Function Disease Editor F D SANER, F.R.C.S. surgeon, Royal Northern Hospital. Bristol John Wright & Sons 1950 Pp 316 45s

THIS book is a symposium by fifteen contributors under the editorship of a surgeon Its value lies in its many-sidedness and in the fresh authoritative manner in which it is largely written, more particularly where it describes the pathology and biology of cancer of the breast and methods of dealing with it It offers descriptions of new or relatively new techniques such as biopsy, the exploration of the lymph gland of the second intercostal space, and the limitations of the use of radioactive phosphorus in the diagnosis of malignancy It also includes an account of plastic surgery for secondary repairs and for æsthetic reasons. One chapter gives a lucid though perhaps slightly personal exposition of the principles governing the use of radiotherapy, and an appendix of statistical data brings into perspective the importance of breast cancer

In the 316 pages there are nearly 200 illustrations and diagrams The textual space for each subject is therefore limited, and though fairly common hormonal curiosities such as gynæcomastia receive their due, normal function is scarcely touched upon But for its size the book is a useful guide for the practitioner in the diagnosis and treatment of pains and lumps in the breast

The Nutritional Improvement of Life

HENRY C SHERMAN Mitchill professor emeritus of chemistry Columbia University New York Columbia University Press London Oxford University Press 1950 Pp 270 24s

Professor Sherman is a doyen of American nutritionists, for his early work with Atwater was published as long ago as 1901 This book he says, completes a trilogy with his well-known works *The Science of Nutrition* and *Foods Their Value and Management* It is essentially a history of the discoveries in nutrition during the past fifty years, and an attempt to assess the human implications of the new knowledge Medical readers will be charmed by the clear manner in which both old and new problems are set out, and will be grateful for the excellent bibliography yet they will be infuriated too for often just when the argument is becoming intricate and interesting, there is an abrupt change down to a simple presentation of well-known facts Professor Sherman has never really decided for whom he is writing "Here ' the publishers declare, ' is the book for everyone, layman or student, who has any interest in the science of nutrition '; but there is far too much tough and disputatious matter to justify this claim. The book deals well with the evidence that by proper attention to nutritional principles we can both add life to our years and add years to our lives ' We trust that Professor Sherman will continue to demonstrate this in his own person and that in due course his trilogy will grow into a pentateuch Could book IV be for the pundits and book V for the debutantes, please ?

The Physiology of Tissues and Organs

DOUGLAS H K. LEE, M D, F.R.A C.P professor of physiological climatology Johns Hopkins University Baltimore Springfield Ill C C Thomas Oxford Blackwell Scientific Publications 1950 Pp 159 30s

IT is always a problem to know where to begin when teaching physiology to students who have only an elementary knowledge of the science of non-living things and of dead specimens of things that once lived Should one begin at once with a systematic study of physiology and hope that by the end of the course the principles will be plain, or should one skim through the whole subject, building a framework on which, later, the detailed structure may be supported ? If the former method is used some students give up hope and conclude that the subject is too obscure for their understanding If the second method is tried some grow bored at apparent repetition. In either case only the more intelligent or keen realise until much later the links and difference between animate and inanimate, and between all living things Professor Lee has chosen a third way He has tried to progress from the familiar background of physics and chemistry to the unfamiliar complexities of the living cell, both in general and in the basic vertebrate types in particular and from thence to cells arranged to form organs The organs are considered from the functional point of view First the requirements for the efficient performance of a given function are outlined and next the way in which organised cells meet these requirements

The book is based on class and lecture notes, and the subject matter is condensed It does not pretend to be other than elementary and stops before the stage of considering systematic physiology is reached. It is refreshing in its approach to the subject and succeeds in suggesting in small compass many interesting possibilities and general principles that should whet the appetite of the beginner It can be recommended as an introduction to physiology

Technique of Analytical Psychotherapy

WILHELM STEKEL. Translators Eden and Cedar Paul London John Lane 1950 Pp 403 21s

THIS is a revised edition of the book published in 1938 in which Stekel described his technique for short analysis lasting three to four months It remains an interesting and stimulating work, with a great deal of practical advice on such matters as the selection of patients, the beginning of treatment, the management of the transference, and the therapist's relations with the patient's family, and the plentiful case-histories are full of instances of Stekel's intuitive skill His theories do not always convince, and his psychopathology is an eclectic assortment of theories gathered from Freud Jung Adler Nietzsche, and Schopenhauer which he makes little attempt to weld into a formal whole He lays much stress on the individual, regarding each patient as a unique case for the therapist's study and mastery, and it is as a brilliant tactician rather than as strategist that he will long be remembered

Industrial Health

An Introduction for Students R PASSMORE M.A D.M., lecturer in physiology department of public health and social medicine, University of Edinburgh CATHERINE N SWANSTON M.B C.S., D.P.H D.I.H lecturer in industrial health in the department Edinburgh E & S Livingstone 1950 Pp 110 4s 6d

WITHIN the limits set by the authors in their preface, this is a successful book. Their aim is to set forth the rules of industrial hygiene, which are, they say, based on ' simple and straightforward principles of human physiology and psychology ' But in the text they contrive to show that the whole subject is not really very simple The book emphasises the physiological and sociological rather than the strictly medical and pathological aspects of the subject, and therefore it is somewhat unbalanced There is a tendency nowadays to soft-pedal the clinical and pathological aspects of medicine and to beat the big drums of sociology Another way of putting it is that groups rather than individuals hold the stage It is often forgotten that the individual is just as important as the group For these reasons we hope that in their next edition Dr Passmore and Dr Swanston will add more about medicine and that they will write more for doctors (and budding doctors) and less for laymen.

In 110 pages they manage to give a surprising amount of information about the distribution of man power in Great Britain, differential mortality rates production figures and labour turnover The physical and psychological factors of environment which adversely affect the workers health are ably discussed. On factory legislation it is stated that laws can only lay down minimal standards which are easy to attain and which everyone recognises as just It would be interesting to have the opinions of employers as to whether they regard the requirements of the Factories Acts and its numerous regulations as minimal and easy to comply with contrary to what this book suggests there are few employers who reach in all respects the standards set by the factory

laws But apart from a few such highly debatable statements, the information given is accurate, and the book is a stimulating introduction to industrial medicine in its sociological aspects

Social Medicine

Editor LAGO GAIDSTON, M D New York Commonwealth Fund 1949 Pp 294 $2 75

THE high cost of medical care and the narrowness of current medical education led to the convening of a conference on social medicine as part of the centennial celebration of the New York Academy of Medicine Such a representative gathering including, inter alia, historians, physicians, public-health and nutrition experts, psychologists, and sociologists, expressed in corporate form the underlying conviction that "the days of monastery medicine and the ivory tower are gone" This book is a symposium of the papers contributed during the conference

The early chapters are devoted to an excellent historical review of the changing relations between medicine and society since the days of Ancient Greece The portrait of the evolution of social medicine is very clear Though the individual contributions to the section dealing with the scope and objectives of social medicine are first rate, the picture as a whole is ill defined too many varying definitions tend to confuse the reader The chapters on epidemiology and nutrition are good, but the comprehensive account of the social applications of psychiatry is too weighty for easy assimilation

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W V MAYNEORD, D SC, F INST P London British Institute of Radiology Suppl no 2 1950 Pp 290 35s

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THE LANCET

LONDON SATURDAY, DEC 9, 1950

The Second Premise

As our correspondence columns have shown, opinions differ widely on the proposed dismissal of hospital registrars Our own have been based on three premises

1 The number of registrars in training for senior posts should not grossly exceed the number of likely vacancies
2 Except in a few specialties the only senior post open to a registrar is that of full consultant
3 A rapid increase in the number of consultant posts can no longer be expected.

If all three premises are valid, the Ministry's cut is inevitable a great many registrars will have to go Yet it is increasingly apparent that the National Health Service would thereby be damaged rather than improved. In the long run general practice would gain by absorbing some able men and women from the hospitals, but this advantage would, we believe, be more than offset by the loss to many hospitals through their departure, and the waste of much of their talent and training No doubt some of their present work could be done by existing consultants, some by housemen, and some by clinical assistants, but much of it would not be done so well, or would not be done at all, for it is the presence of responsible trained registrars that has raised the standard of so many departments In other words, the decision will positively downgrade the hospital service, and in present circumstances it will do little to upgrade general practice If this is true—if the consequences of acting on our three premises are going to be bad—possibly there is something wrong with the premises themselves ?

Apart perhaps from the registrars of St Lukes' Hospital, Bradford,[1] who declare themselves willing to face intensive competition leading to survival of the fittest, few have challenged our first premise —that the number of registrars in training should not grossly exceed the number of likely vacancies This principle is accepted equally by the profession and by the Government, and will certainly be maintained Our third premise has been widely and forcibly questioned, but we still think that, at a time when hospital building is approaching a standstill, it is unrealistic to suppose that the establishment of consultants can soon be brought up to the optimum contemplated in the Ministry's *Development of the Consultant Services* The best hope of finding a practicable solution of the registrar problem lies rather, we suspect in reconsidering the principle embodied in our second premise—namely that (save in exceptional circumstances, where the appointment of a senior hospital medical officer is tolerated) there shall be no grade of hospital doctor intermediate between the senior registrar in training and the consultant enjoying full and final clinical responsibility This principle was advanced by the profession, not by the Government, but many in the profession are beginning to wonder whether it is sound. Do not common sense and the needs of the service demand that many of the present registrars on completing their training period, should remain in hospital work as what Dr MacWilliam[2] calls "assistant consultants" ?

With his usual vigour and cogency, Dr Ffrangcon Roberts in his letter this week points out that the situation has changed since the unplanned days when the number of consultants depended on the support of the fee-paying public, and he calls for a review of the new needs Such a review would have to be rather more radical than that entrusted to the Spens Committee[3] when it was asked to say what remuneration consultants and specialists should receive in a national medical service The committee interpreted its brief widely, and was wise and far-seeing in its proposals for the livelihood of registrars as well as consultants, but it somehow ignored the fact that much hospital work can suitably be done by men and women who cannot be fairly classed as either The unhappy sequel was that, in accepting the report, the Ministry of Health left everyone imagining that all specialists would be paid on Spens scales, and when, much later, it announced that many of them would be graded only as senior hospital medical officers, the profession as a whole resented what looked like an attempt to man the specialist services on the cheap An uneasy compromise was reached when professional bodies persuaded the Ministry to confine the S.H.M.O grade to specified specialties[4] but the effect of this compromise is that many senior registrars, who are highly trained physicians, surgeons, or obstetricians though they have so far failed to secure a full consultant post, are now to be invited to leave the hospital service for general practice Clearly this state of affairs, arising more from conflict than from objective planning demands the reconsideration for which Dr Roberts appeals The fact that a review of hospital medical establishments is even now in progress makes it all the more necessary that the Ministry, having deferred action so long, should stay its hand until the implications have been studied more closely

At least one basic question has not yet been answered, or even perhaps posed, by the Ministry or the profession Is it really advisable that full consultant status should be conferred, as the Spens Committee recommended, at the end of the training period —normally round about the age of 32 ? Unless a man is unusually talented and mature, this is an early age at which to take on the responsibilities which as Dr Roberts says the word "consultant" ought to imply One result of such early promotion is that consultant status lasts some 33 years, whereas registrar status—even including junior posts—lasts

1 *Lancet* Nov 25 1950 p 633

2 *Ibid* Dec 2 1950 p 714
3 Report of Interdepartmental Committee on the Remuneration of Consultants and Specialists 1948 Cmd 7420
4 See *Lancet*, Oct 14 1950 p 476

laws But apart from a few such highly debatable statements, the information given is accurate, and the book is a stimulating introduction to industrial medicine in its sociological aspects

Social Medicine

Editor IAGO GALDSTON, M D New York Commonwealth Fund 1949 Pp 294 $2 75

THE high cost of medical care and the narrowness of current medical education led to the convening of a conference on social medicine as part of the centennial celebration of the New York Academy of Medicine Such a representative gathering including inter alia, historians, physicians, public-health and nutrition experts, psychologists, and sociologists, expressed in corporate form the underlying conviction that "the days of monastery medicine and the ivory tower are gone" This book is a symposium of the papers contributed during the conference

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Surgical Relief of Angina Pectoris

THE surgical approach to angina pectoris has been mainly of three types In the first the demands on the coronary circulation are decreased by lowering the basal metabolic rate Some years ago total thyroidectomy was adopted for this purpose [1], but utterly hypothyroidism has been induced by thiouracil and its derivatives [2] In the second type of approach an attempt is made to revascularise the heart by attaching to its surface either omentum,[3] muscle,[4] or lung [5] as a pedicle graft Alternatively, anastomosis between the coronary end-arteries is promoted by applying to the surface of the heart foreign particles which evoke an inflammatory reaction [6] Other measures said to increase the blood supply include ligation of the coronary sinus,[7] pericoronary neurectomy,[8] and various forms of direct arterial anastomosis [9] In the third approach the afferent sympathetic pathways from the heart are divided, concurrent division of the efferent sympathetic fibres to produce vasodilatation, though probably less important, may improve the result This third—neurosurgical—approach commands most attention, but sympathectomy has never become as popular in angina as in hypertension [10] and peripheral vascular disease [11] This is not surprising in view of the poor prognosis for patients with angina, indeed with this condition the tendency is often to avoid any but the most pressing operations With other diseases we at least *hope* that sympathectomy will improve the prognosis as well as relieving symptoms with angina we can only hope that sympathectomy will make the patient's remaining days more comfortable

The development of neurosurgical procedures for angina has followed, and contributed to, progress in our knowledge of the pain pathways from the heart Most workers agree that the majority of pain fibres pass through the inferior cervical and the upper 3 or 4 thoracic sympathetic ganglia on both sides [12] From there they traverse the white rami communicantes and enter the spinal cord through the posterior roots of the corresponding segments The rational procedures are therefore

1 Posterior rhizotomy, in which the upper 4 or 5 thoracic roots are divided on both sides Some surgeons report most favourably on this procedure,[12 13] but others have been less fortunate [14]

2 Paravertebral block with procaine [15] or with alcohol.[12] The procaine method may give protracted relief The alcohol method provides relief in about 60% of cases, but it carries an appreciable mortality-rate and has other disadvantages

3 Cervicothoracic ganglionectomy, in which the stellate and upper thoracic sympathetic ganglia are removed on one or both sides This has replaced the older operations in which various parts of the cervical chains alone were removed WHITE and SMITHWICK [16] and SJÖQVIST go down to T3 segment, while OLIVECRONA [14] goes as low as T4 or T5 All these surgeons prefer the anterior [17] to the posterior approach, for patients with angina do not tolerate the prone position General anæsthesia is probably better than local, and the sympathetic chain should be well infiltrated with procaine before it is manipulated [18] Lighted retractors greatly reduce the difficulties of the operation.

LINDGREN [19] has made a valuable study of the results in 105 cases, treated by cervicothoracic ganglionectomy in OLIVECRONA's (80 cases) and SJÖQVIST's (25 cases) clinics in Sweden, taking as controls 88 unoperated cases Briefly her findings are these The operative mortality was 8 5%, and the remote mortality-rate up to two years was the same in the operated as in the unoperated group Three quarters of the patients had relief from pain on the side of the operation, and in two thirds the capacity for work was increased More than half had a bilateral operation, performed first on the side where the pain was worst (usually the left), the two stages should be divided by an interval of at least two months In a third of the patients migration of the pain towards the head took place after operation, and in 10% this vitiated the result. Relief of pain does not remove a "warning signal," for after operation all the patients had *some* residual pain or pain equivalent the feeling of substernal oppression which accompanies the pain in the anginal syndrome was unaffected On the other hand, the anxiety which many experience was greatly alleviated The pulse rate was slowed after bilateral operations, but there was no effect on the blood-pressure or heart-volume, and no consistent effect on the electrocardiograph (E C G) readings Two troublesome complications were traumatic neuritis and nasal congestion Taking account of all factors, a satisfactory result was achieved in over half the cases LINDGREN suggests that the operation "should be reserved for a group of patients who, after an adequate period of observation, cannot be controlled effectively on a medical régime" (It may also be of value in certain cases of hypertension after thoracolumbar sympathectomy [20]) It is contra indicated in patients (*a*) with hypertension in whom myocardial infarction has been followed by a permanent drop in blood-pressure, (*b*) with an E C G indicating myocardial damage combined with cardiac enlargement, and (*c*) with moderate or considerable cardiac insufficiency

Judging by the results of operation, it seems that most clinicians are too conservative in the management of angina We should like to see more of these operations performed in Britain and elsewhere, so that their value may be finally assessed Paravertebral injections of alcohol cannot be regarded as a simpler and safer method of achieving the same result [18]

1 Blumgart H L, Levine S A Berlin D D *Arch intern Med* 1933 51 866
2 Raab W *J Amer med Ass* 1945 128 249
3 O Shaughnessy L *Brit J Surg* 1936 23 665
4 Beck C S *Ann Surg* 1935 102 601
5 Lezius A *Arch klin Chir* 1938 191 101
6 Beck C S *Arch Surg* 1929 18 1659
7 Fauteux M Palmer J H *Canad med Ass J* 1941 45 295
8 Fauteux M Swenson O *Arch Surg* 1946 53 169
9 Fauteux M *Rev canad Biol* 1946 5 252 Beck C S Stanton E Batluchok W Leiter E *J Amer med Ass* 1948 137 436
10 See *Lancet* 1950 i 768
11 *Ibid* July 8, 1950 p 59
12 White J C Bland E F *Medicine Baltimore* 1948 27 1
13 Quillaume J Mazars G *Pr méd* 1948, 56 690
14 Lindgren, I Olivecrona H *J Neurosurg* 1947, 4 519
15 Mandl F *Wien klin Wschr* 1936 49 531
16 White J C Smithwick R H Autonomic Nervous System London 1944
17 Gask, G E., Ross J P Surgery of the Sympathetic Nervous System London 1937
18 Learmonth J R *Lancet* Nov 11 1950 p 505
19 Lindgren I *Acta med scand* 1950 suppl 243
20 See *Lancet* 1950 i 1160

about 7, and in practice this means that the consultants greatly outnumber their juniors in training If registrars did no more than receive instruction, this numerical discrepancy would not matter, but they do many other things Drawing a military parallel, Dr CHARLES HILL [5] remarks that "a captain in the Army is not only training to be a colonel, he is at the same time doing a captain's work" Are we not in some danger of reproducing the inconveniences of an army in which there are more colonels than majors and company-commanders? Admittedly there are objections to doing advanced clinical work in a capacity that is even nominally subordinate But the plain fact is that such work is being done satisfactorily by senior registrars all over the country, and it seems a little odd to tell them that they must forthwith stop doing it because, now that their training is over, our principles forbid us to offer them anything less than the consultant posts they cannot get How deeply are these principles founded? Are they, actually, much more than a vigorous opposite reaction to the Ministry's unexpected and disappointing introduction of the SHMO grade? The crisis over the registrars may serve a useful purpose if it causes such questions to be asked Until proved otherwise, this crisis should be regarded as a symptom of some underlying defect in our system, which needs to be exposed and corrected

Some reduction in the number of registrars is desirable as well as inevitable, but the Ministry's drastic cut is neither the one nor the other It might, we suggest, be avoided if the profession were to abandon its opposition to an intermediate grade between registrar and consultant To posts in this grade, which would replace that of SHMO and might command comparable remuneration, men would be appointed competitively after finishing their registrar training Under the title of assistant consultant, junior consultant, or (perhaps better) specialist, they would continue to work under the general supervision of a consultant, and as opportunity offered they would apply for consultant posts Doubtless a few of the more brilliant would gain these as early as they do now, but the normal time of attaining consultant status would probably be nearer 40 than 32, and those who did not secure consultant appointments could if they wished go on doing their chosen work, without this recognition, to the end of their career The time has come when the advantages and disadvantages of such an arrangement should be thoroughly debated For our part, we hope that our second premise may prove to be removable

Mass Radiography

IT takes time to learn to handle a new tool, even when we are guided by experts When the tool itself is new there are no experts, and those who use it must learn its possibilities together Mass radiography is undoubtedly a tool of great value, but at the meeting of the Tuberculosis Association on Nov 24 several speakers doubted whether we had yet discovered its proper purpose Our hope has been to sift out from the general population those suffering from early tuberculosis or other serious chest disease and to ensure that they receive early treatment That mass radiography can in fact be used in this way is certain. Dr PETER KERLEY quoted as an example the 332 cases of active tuberculosis discovered by CLUTTERBUCK's unit at Glasgow, and followed up These patients stayed on an average 6–7 months in hospital, and there were only 3 deaths among them, in a comparable control group the average stay in hospital was 18 months, and there were many more deaths No one would attempt to belittle the importance of such results, but they must be seen in relation to the situation as a whole The tuberculosis service needs much costly renovation it lacks new quarters and equipment for the dispensaries and chest clinics, more beds, more staff Mass radiography, as used at present, is expensive Dr HOFFSTAEDT, whose contribution to the discussion we publish on another page, estimates that, using this method in an unselected population, the cost of finding a new case —that is, a case not already known to the clinics— may range from £11 to something like £109 (or, in exceptional circumstances, to more than £600), depending on the incidence rate and on the overhead expenses of the unit Some feel that we should not be spending so much on finding new cases when we are not yet providing adequate treatment for those already found. Again, mass radiography can offer only a partial and incomplete contribution even to the task of case finding At present we can only hope to survey about 7% of the general adult population yearly, and 80% or more of our case finding is still done by other methods If we could survey the entire population annually it might be different, but, apart from the fact that this would occupy the time of far too many people, the cost would be prohibitive Moreover, would an annual survey suffice? Often enough people are found to have tuberculosis, sometimes already cavitating, who a few months or weeks before gave a normal radiograph in a mass survey Nor is diagnosis from a miniature—or indeed any other—film infallible, as various tests have shown

These considerations all suggest that we are trying to use mass radiography in the wrong way In the Newcastle region, as Dr HOFFSTAEDT tells us, there are plans for applying it only to industries and groups where a higher proportion of positives may be expected than in the general population These include industries with a dust hazard, especially those employing young women, school leavers, school staff, and all others in regular contact with children, young people entering the Forces (among whom, as mass radiography has already shown, new cases are very likely to be found), prospective employees whose employers wish them to be examined, women attending antenatal clinics, chronic sick, suspects referred by doctors and chest clinics, contacts, and volunteers from the general population These selected groups will provide plenty of work for the units, and must inevitably give a better yield of new cases than would equal numbers of unselected population Suspected cases might well be sent for radiography on a 5 × 4 in film of the type described by Dr OWEN CLARKE, and only those in whom the findings are positive might then need a full size film Miniature radiography could in this way be used economically and effectively, thus perhaps releasing funds for use in other parts of the country's chest service

5 *Daily Telegraph* Dec 4, 1950, p 4

use of protective measures can be ensured, and they hope the Ministry of National Insurance will give the Ministry of Health and the Department of Health for Scotland "every possible assistance to this end" More over, the Ministry might ask for a report, on each claim made, of what precautions had been taken or omitted by the claimant, and the establishment in which she or he had been employed

Like others interested in this subject they have been impressed by the dearth of statistics showing the incidence of tuberculosis in different classes of the community, and they point out that statistics based on claims could be used to show the comparative incidence rates of the disease in particular industries and occupations Those who have to find staff to nurse the tuberculous in sana toria and chest hospitals have always feared that any public emphasis on the chances of infection might injure recruitment, but experience has proved that nurses are not deterred by risks they know and understand and against which they recognise that precautions are being taken They are made much more uneasy by their own vague doubts and fears and those of their family and friends When E K Geer,[5] in 1931, instituted rigid precautions in Anoker Hospital, St Paul, he reminded patients and staff repeatedly that "eternal vigilance is the price of safety" He found that these precautions did not frighten nursing candidates off, but had just the opposite effect Dr Horace Joules, at the Central Middlesex Hospital, warns candidates and their parents that his nurses are expected to nurse tuberculosis, but explains the measures taken to protect them, and he never gets a refusal The fact that the community is willing to recognise the risk, and com pensate the nurse for taking it, may even help rather than hinder nursing recruitment

The council recommended that the disease should be presumed to be due to the nature of the nurse's or health worker's employment unless the contrary is proved, and that the period of presumption should begin 6 weeks after entry into the work and end 2 years after the date of leaving it One dissentient held that a year after the date of leaving would be adequate The fact that other health workers are included gives equal privileges to doctors and others, who may also be exposed to risks of infection The council deliberately confined themselves to tuberculosis, deferring any consideration of other communicable diseases until experience had been gained from this initial inquiry The regulations are to be made as soon as they can be worked out with the health Departments

FLUID BALANCE

THE record attendance at the Medical Society of London on Nov 27 testified to the importance now generally attached to the balance of fluids and electro lytes in the body Dr H L Marriott opened the pro ceedings with a lucid account of the subject, which he has done so much to advance About a ton of fluid passes in and out of the human body every year, he said, and yet its water-content in health remains remark ably constant About five sevenths of the body water lies within the cells and the remainder is extracellular fluid (tissue fluid and plasma) Pitting œdema is usually evidence that at least a gallon of water has already accumulated in the tissue spaces owing to changes in intracapillary osmotic or hydrostatic pressure or to water and salt retention Œdema due to hypopro teinæmia does not appear until the plasma proteins are grossly depleted and the body's reserves of mobile protein exhausted Once present, it takes a long time to go, even on a high protein diet powdered skimmed milk is a good source of protein, but the equivalent of a bathful of milk may be required! Dr Marriott discussed the mechanical removal of œdema fluid, the indications for restriction of salt, the question of water intake, and the use of mercurial diuretics Dehy dration arises from insufficient intake of fluids or loss of alimentary secretions or sweat If the fluid intake is inadequate, deficiency is essentially of water, and the osmotic pressure of the extracellular fluid rises, water passing out of the cells creates a sensation of thirst If, on the other hand, the patient is losing bodily secre tions—e g, by diarrhœa or vomiting—deficiency is of water and salt, and his dehydration will not respond to ingestion of water alone Salt depletion, said Dr Marriott, is often missed, yet the type of dehydration present is easily determined by simply asking oneself the question —how has it arisen?

Dr N R Lawrie reviewed the work of E A Schäfer and E B Verney on the rôle of the pituitary in the control of diuresis Thanks to them, he said, it is now known that the posterior pituitary secretes an antidiuretic factor in response to changes in the osmotic pressure of the serum reaching it this system is so sensitive that a change of 1% in osmotic pressure leads to a 1000% change in renal excretion The hormones of the supra renal cortex are also concerned in the retention of sodium chloride, and so of fluid, since more sodium is retained than chloride, the administration of these steroids may lead to alkalosis as well as œdema In the discussion, Sir Heneage Ogilvie observed that soldiers are taught to manage on a very small water ration, and expressed the view that some of the mortality among the wounded during the war could be attributed to dehydration Mr Dickson Wright deprecated the excessive use of the intravenous route, when he went round his wards at night and took down the houseman's drips he felt that he was doing a useful piece of work Dr F Avery Jones thought that the potassium ion was not receiving the attention it deserved The traditional meat extracts, he said, are rich in this essential factor, but if the patient cannot take anything by mouth, potassium may be added to infusion fluids Dr Marriott agreed that potassium is an "up and coming" ion but it can also be a dangerous ion, especially if renal function is poor

A working knowledge of the theoretical background of fluid balance has become essential to every practising surgeon The distinction between the two types of dehy dration—water depletion and salt depletion—is partic ularly important, though both may of course be present at the same time As Dr Marriott pointed out, a con sideration of the cause of the condition may tell us which form we are dealing with on the chemical side, the serum sodium level is the only certain guide (as Dr D A K Black remarked in the lecture summarised on p 778), but estimation of urinary chloride will often help With the invasion of the hospitals by pure science, pathology laboratories are being submerged with requests for estimations of unequal value to the patients But the measurement of the urinary chlorides can frequently facilitate the rational treat ment of postoperative vomiting without adding to the pathologist's burden, for Fantus's test, performed in the side room, will usually help in the decision as to whether saline is indicated or not If the house surgeon does this simple test himself, he need have no com punction in asking the clinical pathologist to estimate the serum potassium in selected patients Possibly soon many hospitals may have facilities for rapid estimation of sodium and potassium by flame spectro photometry[1 2] Elaboration of data will make even greater the need for increased study and understanding by clinicians of the problems of fluid balance

5 *Amer Rev Tuberc* 1931 29 88

1 Wynn V Simon S Morris R J H McDonald I R Denton D A *Med J Aust* 1950 1 621
2 Spencer A G *Lancet* Nov 25 1950 p 623

Annotations

CHLORAMPHENICOL ON PRESCRIPTION

As reported on p 759, chloramphenicol ('Chloromycetin') is now manufactured in this country in sufficient quantity for it to be dispensed on prescription This antibiotic is the only one which is produced by synthesis on a commercial scale It is given by mouth, but because of its extremely bitter taste must be taken in capsule form, it is not suitable for parenteral injection A number of infections which are resistant to penicillin and streptomycin respond to chloramphenicol —namely, the enteric fevers, rickettsial diseases (including Q fever), virus infections of the lymphogranuloma —psittacosis group, atypical (virus) pneumonia, and acute brucellosis These are the main therapeutic indications for the new antibiotic In addition it is of value in urinary tract infections due to penicillin resistant or sulphonamide-resistant strains of *Bact coli*, proteus, *Staphylococcus pyogenes*, and *Strep fæcalis*, it is less effective against *Pseudomonas pyocyanea* Chloramphenicol should be used with discretion in urinary tract infections, careful search for underlying obstruction should be made in all cases For controlling the infection alkali therapy or sulphonamides are the treatment of choice, in the acute cases which fail to respond, sensitivity to sulphonamides, penicillin, streptomycin, and chloramphenicol should be tested and treatment given accordingly

Chloramphenicol has a considerable antibacterial action against flora of the respiratory and intestinal tracts Preliminary reports suggest that it may be beneficial in whooping cough, this problem requires further investigation and trials are being carried out at a number of centres in this country With an adequate oral dose chloramphenicol reaches therapeutic levels in the cerebrospinal fluid, and very satisfactory results have been reported in *Hæmophilus influenzæ* meningitis Serious toxic effects are rare though granulopenia has been reported[1] Anorexia, nausea, and looseness of the stools are not infrequent, glossitis, stomatitis, pharyngitis, and proctitis occasionally develop and seem to be due to yeast infection These complications usually clear up rapidly when the drug is stopped

Chloramphenicol is the first of the new oral antibiotics to be released Experience has shown that in this country there are a few, but only a few, diseases resistant to penicillin and sulphonamides for which its value is clearly established In our admiration for the new specific remedies we are apt to overlook their cost, particularly when this is included in a national rather than a personal budget Moreover, the newer the remedy, the higher the price One week's treatment with sulphonamides or penicillin costs approximately 10*s*, six days' treatment with chloramphenicol costs £10 at current prices From every point of view therefore it is in the best interests of the patient that treatment with the newer antibiotics should, wherever possible, be subject to strict bacteriological control

MECHANICAL HEART AND LUNGS

THORACIC surgeons have long dreamed of a machine which will take over the duties of the heart and lungs while they are operating on these vital organs Gradually their dream is approaching fulfilment, and many hospitals throughout the world—the Sabbatsberg in Stockholm, for example, and Hammersmith Hospital here in London —have mechanical heart lungs working efficiently

Hitherto, mechanical heart lungs have been used solely to supply oxygenated blood to the brain, but in Philadelphia, after years of experiment, Gibbon[1] has completely diverted the dog's blood stream from both venæ cavæ and successfully returned it to the circulation Four dogs are still alive and well 8–10 months after having their blood stream diverted in this manner for 30–46 minutes In Stockholm, Björk[2] has devised an apparatus in which a series of revolving plates are partly immersed in a trough of blood in an atmosphere of oxygen, this allows an oxygen uptake of about 130 ml. per minute with a blood flow of 800 ml per minute, so it seems to be somewhat more efficient than the method of Gibbon which introduces up to 70 ml. of oxygen per minute

The difficulties of applying these methods to man remain formidable The patient's blood must be heparinised, and the machine requires preliminary priming with compatible blood Insertion of the cannulæ is likely to raise further difficulties In the dog, Gibbon has ingeniously reached the superior vena cava through the stump of the azygos vein, and the inferior vena cava through the right auricular appendage This technique necessitates an approach through the right side of the chest, and in operations on the mitral valve, for example, the burden of bilateral thoracotomy might prove too heavy for the average patient Nevertheless, Stokes and Gibbon have taken us another step towards the ultimate goal

TUBERCULOSIS AND HEALTH WORKERS

NURSES who acquired tuberculosis in the course of their work were, until recently, likely to experience much hardship No special provision was made for their care or maintenance, and many of them ended their lives almost in penury Since the introduction of larger tuberculosis allowances such extreme hardship has disappeared, but the position of nurses differs from that of others who acquire tuberculosis in that they usually enter nursing training during their most susceptible years, and are exposed to greater risk of tuberculous infection than people in other walks of life There is no doubt that they can be very largely protected from this added risk by special precautions to safeguard their health, or that, if they acquire it, they stand a good chance in most hospitals of being treated early and successfully these, indeed, are proper objects at which every hospital should aim Moreover every hospital should see to it that nurses are fully reabled, preferably on full pay But there are still hospitals which fail in these duties The decision of Dr Edith Summerskill to insure, under the National Insurance (Industrial Injuries) Act, nurses and other health workers in close and frequent contact with tuberculosis infection, though a welcome if tardy, recognition of the nurse's special risks, must in no sense be regarded as a substitute for proper standards of care (Court[3] found that "the risk of contracting tuberculosis is significantly greater for nurses in most general hospitals than for other professional women of the same age")

The Minister based her decision on a report,[4] just published, by the Industrial Injuries Council, under the chairmanship of Sir Wilfrid Garrett The council had in mind the great disparity between the standards of precautionary measures in different hospitals, and frankly declared "there is little prospect of a close approach in the near future to ideal conditions in all the hospitals concerned" But they evidently felt that to prescribe tuberculosis as an industrial disease might well hasten rather than retard a general levelling up Claims might be reduced effectively, they hold, if a wider

1 Volini I F et al *J Amer med Ass.* 1950 **142**, 1333

1 Stokes T L Gibbon, J H *Surg Gynec Obstet* 1950 **91** 129
2 Björk V O *Acta chir scand* 1948 suppl 137
3 Court D *Lancet* 1949 II 874
4 Tuberculosis and Other Communicable Diseases in Relation to Nurses and other Health Workers Cmd 8093 London H M Stationery Office 1950 Pp 20 6*d*

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"CITIES WITHOUT NOISE"

WHEN Elizabeth Barrett Browning complained that the world was 'full of dreary noises" she can have had no inkling of the din which was destined to rend the air of the 20th century We who live in the age of motor cycles, pneumatic drills, and neighbours' wireless sets may well regret the passing of a time when noises were nothing worse than dreary From excess of visual impressions we can shut our tired eyes, but our ears are never closed, and through them, day and night, we are exposed to noises against which we can offer no defence

In addressing the Royal Society of Arts on this subject on Nov 29, Lord Horder spoke as chairman of the Noise Abatement League, and as one who has played a prominent part in its labours Its most tangible achievement before the war, he said, was the law on night silence in built up areas, the effects of which were soon felt in daylight as well—and are still, as anyone who knew London twenty years ago can testify today But the enthusiastic enemies of noise (who included H G Wells, A P Herbert, E V Lucas, and others of their calibre) had many irons in the fire their sensitive ears could distinguish in the cacophony of the metropolitan orchestra such discordant instruments as the steel riveter, the ageing tramcar, the milk cart, and the dustbin—and they fought them all.

The root of the matter, said Lord Horder, is spacing If we spread ourselves over a sufficient area we cease to offend each other with our noises if we gather too closely together the result is mutual discomfort the happy mean is a problem for the architects, who have often shown their interest in this work. Noisy industries should be zoned, and high buildings alternate with lower ones, school playgrounds should not occupy confined spaces, and airports should be sited so that aircraft need not cross the city Noises in the home also deserve attention, and some people might be prepared to pay a little more for insulated rooms at present (as H G Wells once said) flat-dwellers are about as protected from sounds as they would be from sights if the walls were made of glass!

We must not imagine, Lord Horder continued, that all noise can be prevented some, it seems, must be endured the pneumatic drill, for instance, cannot be silenced without losing most of its power All the more reason, then, to suppress such noises as we can We tolerate the blended hum of street traffic, but the roar of an unsilenced motor accelerating down the street jolts our senses and affronts our sensibility Science, it is true, has made us noisy, but it has also given us the weapons to subdue noise, if we will only use them Those who want to make a really unholy din should do so in the proper place—in a park, perhaps, like Whipsnade, provided for their use "The elimination of needless noise," Lord Horder concluded, "will never be achieved by Acts of Parliament alone—no, nor by science, however firmly we may harness it to this particular purpose It can only come about by a general recognition of the fact that needless noise is a form of selfishness and lack of thought Thus it is the man in the street who must, eventually, decide if we shall have 'Cities without Noise' He must get it into his head that making a noise that is not necessary is a form of bad manners"

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TRADE unionists commonly insist that their fellow workers should join their union by forcing employers to dismiss anyone who does not do so, they successfully apply the policy of the closed shop The idea is that no worker ought to benefit from the efforts of a union unless he supports it by becoming a member, and this is certainly a tenable point of view The situation is altogether different, as the *Times* points out,[1] when it is the employer who insists on membership of a union against the wishes not only of the workers but also of the union concerned That is what the Durham County Council is doing: it has decided that all who work for it must be members of an approved trade union or professional organisation, and it intends to discharge anyone who does not produce evidence of membership Though most of the 48 doctors working for the council are, no doubt, members of professional organisations, at least 44 of them have rightly decided that this demand —made without negotiation on the national level—is unacceptable and the British Medical Association, so far from wishing to receive new members under the council's compulsion, is giving full aid to the objectors The Royal College of Nursing and also the union which represents most of the 4000 teachers in County Durham are taking the same line, and the Government has unsympathetically hinted to the council that if dismissal of teachers and doctors leads to a breakdown of its medical and educational services, central grants towards these services will no longer be payable The council has a good record and its members are no doubt acting from sincere conviction, but, as often happens when people's loyalties are narrow, it is managing to do a great deal of harm

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1 *Times* Dec. 1 p 7

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MAN'S tolerance of adversity is always greater in the event than in the forecast, during the late war civilians in Britain—and in other countries as well—shouldered calmly a far greater burden of anxiety and hurt than had been thought possible without disintegration of the social structure No doubt the same would happen in the even more dangerous conditions of a new war But in the future, as in the past, to tolerate is not enough our inclination, and our duty, is to survive, and the best hope of surviving the strange new dangers we shall face lies in learning what is known of them Thus the editors of the *Practitioner* have done well to publish this month a symposium on the medical aspects of atomic warfare Among other things this disposes of the contention that physical preparation is futile, it is estimated that with a Nagasaki type bomb among a population of density 43 per acre, if everyone were in houses deaths would number 31,100 and injured 29,500, but if every one were in a reinforced brick surface shelter deaths would be 14,300 and injured 10,500 However, preparation does not end with the construction of shelters, much would depend on intelligent action by the public As Sir Ernest Rock Carling (who has advised on the symposium) remarks in his article on morale "Safety will be chiefly in behaviour, and behaviour can be learned so thoroughly as to become instinctive" Here our profession has a large share of the responsibility, for "medical men are better able than others to appreciate the risks, and should know what can be done to avoid them or to mitigate their results No one, perhaps, is in a better position to inculcate the right attitude of the people to danger"

EXPLOSIONS IN THE OPERATING-THEATRE

WHEN Dr H J V Morton ignited 20% cyclopropane in oxygen at the Royal Society of Medicine on Dec 1, he provided the members of the anæsthetics section with a practical demonstration which they will not quickly forget, and when a succession of speakers described the innumerable sources of heat in a theatre, and the inflammability of almost every known anæsthetic mixture, their hearers must have wondered how they had survived long enough to attend the meeting at all. However, the comparative rarity of explosions in the operating-theatre cannot justify the neglect of precautions, these are accidents which can and must be prevented

In his presidential address, Dr Alexander Low pointed out that long continued storage of ether (particularly in sunlight) leads to the production of peroxides which enhance its inflammability—and this includes its use for sterilising skin It explodes more violently in nitrous oxide and oxygen than in pure oxygen, he said, and is safest of all in air Cyclopropane is generally used in a closed circuit in this country, and it diffuses safely from a small leak unless there is a source of heat within one foot, but the stomach can easily come to contain an explosive quantity Dr Low then considered the sources of heat in a theatre The use of electricity involves not only the danger of sparks, but also of heat production owing to overloading, dry batteries are safer than mains transformers Static electricity can be generated in many ways—by sweeping a dry blanket over a rubber mattress, by the passage of gas through rubber tubing, and so on—and the only sure safeguard is the use of conducting rubber and the provision of conductors which lead away the charges to earth Non electrical sources of heat include sterilisers, candles, lamps, hot air syringes—and cigarettes!

Several speakers had personal experience of explosions and fires, and told hair-raising stories of the ways in which they were caused One explosion was the result of propping a cylinder full of gas against a hot radiator another should have occurred, but apparently never did, in a nursing home where the Ministry regulations were hung above the naked jet of a geyser in the theatre

Dr Low described at some length the precautions which should be observed in the ideal theatre they may be laborious, but they are well worth while Sources of heat are more easily controlled than explosive mixtures, but neither should be neglected The universal use of conducting rubber in the theatre[1] is one of the most effective steps that can be taken to eliminate "static"—which even in our damp climate is the greatest danger The floor must be a good conductor, and to it all apparatus and every person in the theatre (including the patient) should be properly earthed Trolley wheels should be fitted with conducting rubber tyres, or be replaced by metal castors other equipment should be provided with drag chains of unpainted metal links[2] Other sources of heat are more obvious and so less dangerous, but all electric fittings and switches should be continually checked by the electricians, and even minor faults remedied immediately Finally, the prevention of faults in the anæsthetics apparatus is the responsibility of the anæsthetist, who must of course be fully acquainted with the mechanics of his machine, as well as with the inflammability of every gas and every mixture with which he works

PAY IN THE FORCES

FOR some time the British Medical Association has been negotiating for improved pay of doctors in the Services, and last week the Minister of Defence announced new rates, which appear on p 776 of this issue Broadly speaking, the remuneration of general duty officers now compares fairly with average incomes in civilian work, but the rates for specialists do not The greatest need of the R A M C is for more specialists, and the new rates promise no permanent relief from the unsatisfactory situation in which the Service advertised for civilian specialists to serve for limited periods on specially attractive terms

AN INFORMATIVE YEAR

TODAY the administrator is more and more dependent on a reliable information service which will tell him how the statutory instrument which seemed so clear and comprehensive in Whitehall strikes the captious realists in the queue at the food office The Ministry of Health has been quick to realise how much help they can get in their new responsibilities from the Central Office of Information[3] A Survey of Sickness has been made every month for the Registrar General, and a special inquiry into schoolboy diets was made for the Ministry of Health This showed that schoolboys in the poorer sections of the population today had diets as good as middle class children before the war The C O I has also helped the Ministry in its campaign to secure the immunisation of children against diphtheria Last year about £30,000 was spent on press and poster advertising, but at a cost of £40 per case of diphtheria the sustained campaign is now helping to save up to £2 million in one year, for the notifications of diphtheria have fallen from 55,000 to 5000 during the past ten years The campaign for the prevention and treatment of venereal disease also continued, and the campaign for blood donors raised their numbers to nearly 378,000 as against 108,000 at the end of 1946 The Health Depart-

1 Bulgin D Llewellyn F J Thomas G *Lancet* 1949, i, 780
2 Lee J A *Post-grad med J* 1950 26 365
3 Annual report of the Central Office of Information 1949–50 Cmd 8081 H M Stationery Office Pp 35 1s

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WHEN Dr H J V Morton ignited 20% cyclopropane in oxygen at the Royal Society of Medicine on Dec 1, he provided the members of the anæsthetics section with a practical demonstration which they will not quickly forget, and when a succession of speakers described the innumerable sources of heat in a theatre, and the inflammability of almost every known anæsthetic mixture, their hearers must have wondered how they had survived long enough to attend the meeting at all However, the comparative rarity of explosions in the operating theatre cannot justify the neglect of precautions, these are accidents which can and must be prevented

In his presidential address, Dr Alexander Low pointed out that long continued storage of ether (particularly in sunlight) leads to the production of peroxides which enhance its inflammability—and this includes its use for sterilising skin It explodes more violently in nitrous oxide and oxygen than in pure oxygen, he said, and is safest of all in air Cyclopropane is generally used in a closed circuit in this country, and it diffuses safely from a small leak unless there is a source of heat within one foot, but the stomach can easily come to contain an explosive quantity Dr Low then considered the sources of heat in a theatre The use of electricity involves not only the danger of sparks, but also of heat production owing to overloading, dry batteries are safer than mains transformers Static electricity can be generated in many ways—by sweeping a dry blanket over a rubber mattress, by the passage of gas through rubber tubing, and so on—and the only sure safeguard is the use of conducting rubber and the provision of conductors which lead away the charges to earth Non electrical sources of heat include sterilisers, candles, lamps, hot air syringes—and cigarettes!

Several speakers had personal experience of explosions and fires, and told hair-raising stories of the ways in which they were caused One explosion was the result of propping a cylinder full of gas against a hot radiator, another should have occurred, but apparently never did in a nursing home where the Ministry regulations were hung above the naked jet of a geyser in the theatre

Dr Low described at some length the precautions which should be observed in the ideal theatre they may be laborious, but they are well worth while Sources of heat are more easily controlled than explosive mixtures, but neither should be neglected The universal use of conducting rubber in the theatre[1] is one of the most effective steps that can be taken to eliminate "static"—which even in our damp climate is the greatest danger The floor must be a good conductor, and to it all apparatus and every person in the theatre (including the patient) should be properly earthed Trolley wheels should be fitted with conducting rubber tyres, or be replaced by metal castors other equipment should be provided with drag chains of unpainted metal links[2] Other sources of heat are more obvious and so less dangerous, but all electric fittings and switches should be continually checked by the electricians, and even minor faults remedied immediately Finally, the prevention of faults in the anæsthetics apparatus is the responsibility of the anæsthetist, who must of course be fully acquainted with the mechanics of his machine, as well as with the inflammability of every gas and every mixture with which he works

PAY IN THE FORCES

FOR some time the British Medical Association has been negotiating for improved pay of doctors in the Services, and last week the Minister of Defence announced new rates, which appear on p 776 of this issue Broadly speaking, the remuneration of general duty officers now compares fairly with average incomes in civilian work, but the rates for specialists do not The greatest need of the R A M C is for more specialists, and the new rates promise no permanent relief from the unsatisfactory situation in which the Service advertised for civilian specialists to serve for limited periods on specially attractive terms

AN INFORMATIVE YEAR

TODAY the administrator is more and more dependent on a reliable information service which will tell him how the statutory instrument which seemed so clear and comprehensive in Whitehall strikes the captious realists in the queue at the food office The Ministry of Health has been quick to realise how much help they can get in their new responsibilities from the Central Office of Information[3] A Survey of Sickness has been made every month for the Registrar General, and a special inquiry into schoolboy diets was made for the Ministry of Health This showed that schoolboys in the poorer sections of the population today had diets as good as middle class children before the war The C O I has also helped the Ministry in its campaign to secure the immunisation of children against diphtheria. Last year about £30,000 was spent on press and poster advertising, but at a cost of £40 per case of diphtheria the sustained campaign is now helping to save up to £2 million in one year, for the notifications of diphtheria have fallen from 55,000 to 5000 during the past ten years The campaign for the prevention and treatment of venereal disease also continued, and the campaign for blood donors raised their numbers to nearly 378,000 as against 108,000 at the end of 1946 The Health Depart

1 Bulgin D Llewellyn F J Thomas G *Lancet* 1949, i 789
2 Lee J A. *Post-grad med J* 1950 26 365
3 Annual report of the Central Office of Information 1949–50 Cmd 8081 H M Stationery Office Pp 35 1s

in system the response was 52–78%, while with the contracting out system it was 74–84% In other words, people do not care to say they are unwilling On the other hand, even the contracting out system may get a poor response if other factors interfere, thus of all the pregnant women attending antenatal clinics in Newcastle who were booked for radiography (contracting-out system) only 60% attended They will bring their children to the welfare clinics, because they get good advice and vitamin supplements, but they are less ready to interrupt their daily chores to go and be investigated for a disease they have no reason to think they have acquired.

LIMITATIONS OF MASS RADIOGRAPHY

The contribution of mass radiography to case discovery is on the whole modest Of all the new cases on the register of a big urban chest clinic in 1949, only 18 5% had been discovered by this method, and in a random sample of the population in a sanatorium only 33 (20%) of 162 men had been found by mass radiography It is worth noting that of these 33, no less than 14—nearly half—had been picked out by mass radiography shortly after joining the Forces In a random sample of 145 patients in the same sanatorium in 1947, the proportion picked up by mass radiography was only 11% In another sanatorium, in 1949, 15 out of 104 women, and 11 out of 70 men had been found in this way (15% in both cases), but again nearly half of the men so discovered had been picked up in the Forces

In any case mass radiography of the total population on a voluntary basis cannot even be attempted The units and personnel at our disposal cannot deal with more than a small fraction of the adult population One unit can manage 25,000–30,000 miniature films a year In Region 1, with a population of over 2,700,000, five units are now operating Average samples from a rural district and a large town indicate that 72 5% of the people in the region are aged 15 or more, and the adult population can therefore be reckoned as 2,110,000 The five units

TABLE III—RESULTS OF SURVEYS CARRIED OUT ON THE PREMISES OF FIVE LARGE FACTORIES

Factory	Attended %	Suspected %	Discovery rate* %
A	60	2 2	0 55
B	73	1 8	0 45
C	60	1 47	0 37
D	53	1·4	0 35
E	37	1 1	0 25

*Discovery rates reckoned as 25% of the cases referred to the clinic or kept under observation (cf table 1)

can deal in a year with only 150 000 people, or 7%, of the adult population of the region

SUGGESTED USE OF MASS RADIOGRAPHY

In this region it is intended that routine surveys should be made in hazardous industries, especially dusty occupations like mining, sand blasting, and steel dressing, in industries and factories known to have an unusually high incidence of tuberculosis, such as tobacco and clothing factories, especially those employing young women, and in any factory or workshop in which an unusual proportion of employees are known to have developed tuberculosis

In addition, it is proposed that there shall be quarterly sessions at every main centre of population, at which the following groups would be regularly examined

1 All school leavers and any other school-child referred by the school medical officer or the family doctor
2 Teachers, school kitchen staff and all others in regular contact with children (e g, kindergarten and nursery school staff, and staff of welfare clinics)
3 All young people of both sexes about to enter the Forces. (This could be arranged in collaboration with the Ministry of Labour and National Service)
4 Prospective candidates for employment, at the request of their firm or employing body (e g, the Civil Service)
5 Women attending antenatal clinics
6 Chronic sick, and all suspects with symptoms, sent by family doctors, factory doctors, or medical officers of health.
7 Patients referred from chest clinics
8 Contacts, for regular examination and follow up (This would be arranged on behalf of and in collaboration with the chest clinics)
9 Volunteers from the general population who wish to be examined

I believe that by keeping to these groups we could use mass radiography much more effectively and economically than we are doing at present

My thanks are due to Dr F L Wollaston Dr W H Dickinson, and the organising secretaries of the Durham and Newcastle Unit, and to the staff of the Newcastle Regional Hospital Board, who kindly supplied the material on which this paper is base

MINIATURE RADIOGRAPHY WITH 4 × 5 INCH CUT FILM

OWEN CLARKE
M.A, M.D Camb
SENIOR MEDICAL REGISTRAR PAPWORTH SANATORIUM

MINIATURE radiography had been under consideration for many years before the late war D'Abreu (1945) has described his own earlier work in France and Brazil, and Bentley and Leitner (1940) were also experimenting in this country, but it was the war which provided the urgent spur to more rapid development of techniques Trail (1942), Trail et al (1944), and Brooks (1944a) were the leaders of progress in the British Services, and when the U S A came into the war there was a wide demand in America for routine chest radiography before enlistment The purposes of miniature radiography in both countries were essentially the same—to avoid the intake of tuberculous people into the Services, and by routine examination of Service personnel to detect cases of pulmonary tuberculosis as early as possible

After the war, development was directed towards the survey of civilian populations, and once again the emphasis was on quantity and on speed of operation individuality was not considered important In a report to the Medical Research Council, Clark et al (1945) considered the relative merits of 35 mm film and the 4 × 5 in stereoscopic films which had proved so popular in the U S A, and they decided in favour of the smaller film It was generally agreed that in skilled hands the technical results were equally good and for civilian mass radiography the 35 mm film "had the added advantages of mobility of apparatus larger numbers of examinations in a shorter time, and much more rapid processing and interpretation" (loc cit p 2) There is also the advantage of compactness in storage with 35 mm

These factors are important for *mass* miniature radiography, quite different considerations arise when miniature radiography is to be a part of clinical and preventive medicine, divorced from the urgency and routine of a mass survey In Britain only 35 mm roll film has so far been obtainable, and all attention has been focused on mass surveys, but the technical efficiency has developed to such a high standard that we should now consider the use of miniature photo

Special Articles

THE PATTERN OF MASS RADIOGRAPHY*

E G W HOFFSTAEDT
M D Berlin
ASSISTANT CHEST PHYSICIAN, HOLLYWOOD HALL SANATORIUM, WOLSINGHAM, DURHAM

THE following figures, based on the work done by mass radiography units in Region 1 during 1949, give some idea of the cost of case finding by this method Four units were in action, three of them completely mobile and independent, and they took between them 97,250 miniature films during the year When all the expenses of running the units are taken into account the average cost per miniature film works out at 4s 6d Cases sent for further investigation, as a result of suspicious findings in the miniature film, numbered 6247, or 6 4% of the total examined Large films taken of these cases worked out at a cost of £3 8s 10d each

The incidence rate of pulmonary tuberculosis discovered by mass radiography seldom exceeds 2% Using the figure of 4s 6d as the cost of a miniature film it is possible to calculate the cost of discovery of a single active case of pulmonary tuberculosis at different incidence rates, as follows

Incidence rate %	*Cost per case discovered* £ s
0 35	61 10
0 4	56 5
0 5	45 0
1 0	22 10
1 5	14 17
2 0	11 5

These would be the costs in an average survey, but it is possible to find extreme examples where the cost per case discovered is much higher, as in the following

Over a period of 2½ months an area with an adult population of 53,700 was surveyed The total number who volunteered for examination was 2315, or 0 04% of the population Of these, 34 (1 5% of the number examined) were referred to the clinic for further examination, and 9 cases of pulmonary tuberculosis were found among them; but 7 of these were known already to the clinic Only 4 were active cases, and 2 of these were already on the register; so the survey revealed 2 new active cases which had been unknown before The cost of the survey was £1261, giving a cost per single examination of 10s 6d, the cost per patient referred to the clinic was £37, and the cost per newly discovered case of active tuberculosis £632

Table I compares the discovery rates (and their cost) in routine surveys, in factories and elsewhere, with the discovery rates in surveys where the cases were selected as suspicious by doctors or chest clinics It will be seen that the cost per case discovered is £8 4s 10d where suspected cases only are examined, as against £109 when unselected populations are surveyed In this particular survey the average cost per miniature film worked out at 3s. 10d

For comparison, the figures from another unit (unit "D") may be considered In this unit the overhead expenses were somewhat higher than those of unit "N," the cost per miniature film in 1949 working out at 4s 9d Unit "D" had an average discovery rate for all cases of 0 67%, the cost per active case discovered being £35 12s At sessions open to the general public the discovery rate was 1%, and the cost per active case found £23 15s

*Based on a communication to the Tuberculosis Association on Nov 21

TABLE I—COST ANALYSIS OF CASES EXAMINED BY UNIT "N" IN 1949

Type of survey	No examined A	No referred to clinic B	New active cases found C
1 (a) Routine surveys of factories, &c Combined with (b) Open sessions to general public (volunteers)	24,171	167 (0 72% of A)	43 (25% of B 0 18% of A)
Cost per case discovered £109			
2 (a) Cases sent by local doctors (b) Cases sent by chest clinics (including contacts)	1085 (8% of grand total)	117 (5 8% of A)	47 (40% of B 2 36% of A)
Cost per case discovered £8 4s 10d			
3 Grand total of 1 and 2	25,158	284 (1 1% of A)	90 (31 7% of B 0 35% of A)
Cost per case discovered £54 7s			

TABLE II—ANALYSIS OF RESULTS WITH DIFFERENT GROUPS OF PEOPLE EXAMINED IN NEWCASTLE IN 1949 (UNIT "N")

Group examined	Referred to clinic or kept under observation D	Estimated discovery rate (active cases) % of total E	E as %age of D
1 Routine surveys of factories, stores, offices, &c	0 5–2 0	0 12–0 5	25
2 School children	0 0–1 0	0 0–0 25	25
3 Sessions open to general public (volunteers)	2 5	1 0	40
4 Referred by doctors and clinics, contacts	6 0	2 4	40

It will be seen from table I that the discovery rate, as might be expected, was lower in routine surveys and open sessions than in selected cases sent by doctors or clinics Table II, which gives the discovery rates of unit "N" with four different groups, emphasises this point When large numbers of supposedly healthy people are examined (as in routine surveys) the discovery rate is low At open sessions for the public it is somewhat higher because those who are anxious about their health are more likely to attend than others, and the group is therefore self selected Among people referred by doctors and clinics, the discovery rate is naturally still higher Table II shows not only that the discovery rate was higher in groups 3 and 4 (the selected groups) but that a higher proportion of those kept under observation or referred to the clinic from these groups turned out to have tuberculosis than was the case with groups 1 and 2

SOME FACTORS AFFECTING RESPONSE

Table III shows one of the weaknesses of unselected surveys in five large factories the discovery rate fell as the response fell (Only one factory (factory A) lies outside this pattern, possibly there was contact infection, or some other special cause, to account for this discrepancy) Bradbury[1] made a similar observation in 1948

Response to an offer of mass radiography examination varies, among other things, with the way the offer is made If candidates are asked to attend if they wish (to contract in) the response is always poorer than if they are asked to say they will not attend (to contract out) Thus Sheffield unit found that with the contracting

1 Bradbury J C S *Lancet* 1948, ii 203

Teaching—These films are very convenient for circulating among a small audience, and for students to copy, or have printed, for personal records

Marking—Miniature films should automatically have the name, date, and unit included on them, thereby avoiding dark room confusion and saving subsequent laborious clerical work The incorporation of a photo-electric timer ensures uniformity of quality and allows comparatively inexperienced staff to attain standard results

CLINICAL USE

Sanatorium and Thoracic Units—Initial diagnosis requires full size films, but much of the subsequent control can be done with 4 × 5 in film Pneumothorax control would be simplified, since it would be no extravagance for junior physicians to keep a permanent record of screening appearances All follow up records and investigation of contacts can be done on small film

General Hospitals—Many proposals have been made for routine chest examination of outpatients, and in Canada the 4 × 5 in film is widely used for this purpose It would not be necessary to process all of these at once, except for a chest clinic, and in most cases a report could be added to outpatient notes The film would be available at subsequent visits if required Other purposes to which this type of film could be put in hospitals are the routine examination of staff and the examination of tuberculosis contacts

Public health Work—Emphasis has recently been laid on the desirability of routine chest radiographs of immigrants This is already obligatory for U S.A and Canada, and the speed and simplicity of miniature cut film has been described elsewhere (Clarke 1950)

Non thoracic Conditions—The use of miniature photo fluorography need not be confined to chest conditions I have used it to locate foreign bodies in the hand and forearm, and for injuries of the upper limb and similar conditions, and have found that it is thereby easy to obtain a convenient and accurate record and to achieve considerable economy in cost of film Experience might well reveal many other examples in which the use of this material would be both beneficial and economical

EQUIPMENT

The apparatus used by the Ontario Immigration Department in London was a Newton Victor set KX12, designed for full-size films, 70 mm camera, and 4 × 5 in. cut film That set is not available in this country

What is required is the stand, screen, tunnel, lens, and cassette holder to operate in conjunction with the usual hospital X ray tube, or with a separate tube for that purpose The mounting and base plate of the tunnel should be designed to take either a roll film camera or 4 × 5 in cut film, so that the more convenient unit may be used for each specific job

It may be possible to modify the present standard 35 mm set to take the necessary lens for 4 × 5 in film if not, the separate stand must be produced

In the past the difficulty has been the larger lens necessary and the slightly more cumbersome equipment If miniature radiography is to develop for general clinical use, and not only for mass survey work, British firms must produce the lens and develop this type of set, and film of the necessary quality must be available in this country Then, and only then, will it be possible for all hospitals and clinics to appreciate the great value of this technique

SUMMARY

Miniature radiography need not be confined to mass survey work, it could play an important part in general clinical medicine

For this purpose the following conditions must be met (1) individual negatives are necessary (roll film is impractical), (2) rapid processing must be possible, so that the X ray film can be read at the same session, (3) the film must be large enough to be read without projection or special apparatus, and (4) the detail must be accurate enough to allow a clinical opinion to be formed, occasional control by full size film may be desirable, but is not essential

Experience with more than 25,000 films has shown that the 4 × 5 in cut film fulfils these conditions, and offers advantages over other types in economy, convenience, and accuracy

British firms should supply the equipment needed for the wider development of this technique

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DISTRIBUTION OF CHLORAMPHENICOL

ANNOUNCEMENT BY THE MINISTRY OF HEALTH

Owing to improvement in supplies, chloramphenicol ('Chloromycetin') will be generally available on prescription from Dec 11 The following provisional lists are intended as a guide to practitioners in prescribing this antibiotic

There are certain infections (list 1 below) in the treatment of which chloramphenicol is more effective than any of the therapeutic agents at present generally available Apart from these there is a variety of infective conditions (list 2 below) in which the value of treatment is less certain, preliminary trials both in this country and abroad have given variable results, and further experience is needed before chloramphenicol can be recommended as routine treatment in these diseases In certain diseases (list 3 below) there is no satisfactory evidence that chloramphenicol has any therapeutic value

1 *Infections in which the therapeutic value of chloramphenicol is superior to that of sulphonamides or penicillin*
- Typhoid and paratyphoid fevers (excepting carriers)
- Brucellosis (undulant fever)
- Rickettsial diseases (i.e, typhus, scrub typhus, Q fever)
- Psittacosis
- Lymphogranuloma inguinale
- Atypical (virus) pneumonias
- Urinary tract infections resistant to sulphonamides and penicillin. (These include infections due to resistant strains of *B coli*, *B proteus*, *Ps pyocyanea*, and *Str fæcalis* Sensitivity of the organism to chloramphenicol should be determined)

2 *Infections in which therapeutic benefit from chloramphenicol has been reported but not fully substantiated*
- Whooping-cough
- Salmonella food poisoning
- *H influenzæ* meningitis

fluorography for general radiological purposes in hospitals and clinics

The 4 × 5 in cut film has been widely used throughout the U S A. and Canada but is almost unknown here My experience in London is based on 25,000 X ray films taken for the Ontario Immigration Department in 1948–49 In my view this size of film possesses such outstanding advantages that it should be the film of choice for further development throughout the British Isles Except for survey work, the 4 × 5 in cut film is preferable to roll film for photofluorography for many reasons, and it also has many advantages over full size film for clinical purposes It is, however, first necessary to be confident of the technical quality of the film

COMPARISON OF RESULTS

Hilleboe and Morgan (1945a) studied and compared the results with 14 × 17 in celluloid film and the various miniature photofluorographic films—e g, 4 × 5 in cut film and 70 mm and 35 mm roll film They tested these films for resolving power, detail, contrast coefficient, and relative sharpness, and in each case the 4 × 5 in film was found to be inferior only to the full size celluloid film and was superior to the smaller types of roll film They held the same view as was expressed in the M R C report (Clark et al 1945)—that the 35 mm roll film was most suitable for mass surveys—but they considered that the 4 × 5 in cut film was preferable for small numbers Although they used both single and stereoscopic 4 × 5 in films, the advantage of the latter was "insignificantly small and of little value" (Hilleboe and Morgan 1945b), but might increase if small films were developed for diagnostic purposes

This preference for the 4 × 5 in cut film has been emphasised by many workers—e g, Clark (1942), de Lorimier (1942), Cranch (1943), Havlicek and Gill (1941), and Brooks (1944b) Tice (1946) surveyed more than 1700 civilians by both 70 mm and 4 × 5 in. films, and his comment is directly relevant to the consideration of future development "In the 70 mm. film we sacrifice specialisation for speed in the 4 × 5 in film we reverse the process and stress individualisation"

Those who have experience of 35 mm mass miniature radiography in this country know that the results show a high degree of accuracy compared with full size films, reports from U S A and Canada confirm that in skilled hands the 4 × 5 in film is of even better quality Fralick et al (1947) report 98 3% accuracy at the Gage Clinic, Toronto, and Plunkett et al (1941) confirm that the 4 × 5 in film gives greater detail My own experience supports this view In the accompanying illustration a contact print made direct from one of these negatives shows the actual size of the film but cannot show the high quality of reproduction attained

ADVANTAGES OF 4 × 5 IN CUT FILM

If it is accepted that the technical standard is adequate, this film has two very valuable advantages over full size film—economy and convenience for storage. Compared with the miniature roll films it has the great advantage of rapid individual processing so that a film, can be taken and examined at the same session, and each patient's films can be kept together in one envelope with his case notes The film therefore combines many of the advantages of full size and miniature material, and if it were introduced into general X ray work it would prove most useful

Economy —Each film costs about 4*d* compared with 2*s* 8*d* for each 15 × 12 in film For fifty exposures the saving is therefore about £5, and a busy department could easily save £1000 a year by using this miniature size for routine work and for follow up of cases Its use need not be confined to chest work, since any case in which the patient can be radiographed erect could be controlled by this method

Individual films allow records to be kept together with the case notes

Speed of processing enables the miniature film to be read at the same session, this is essential for chest clinics and routine follow up of out patients

Storage and Reference —The 4 × 5 in films can be kept with the notes or in separate storage rooms The space occupied is less than a tenth of that occupied by full size films, and by storing in boxes of 100 films reference is made easier 1000 full size films weigh about 90 lb and occupy 4 c ft, whereas 1000 4 × 5 in films weigh about 9 lb and occupy $^1/_8$ c ft A series of films are easily handled for comparison of progress

Viewing by Direct Vision —Enlarging or projection is not necessary, and the wet film can be viewed directly against a window or a viewing box Clark and Poulsson (1941) have shown that accuracy in reading this size of film is easily acquired

Reproductions or Extra Copies —Extra negatives can easily be made at little cost, and they should be a routine on discharge of a patient Reports can be accompanied by an actual X ray picture instead of an inaccurate and vague attempt at a drawing Prints can easily be made by direct contact. Lantern slides require an intermediate negative on fine grain film, the technique of which is simple and within the capability of any X ray department but 4 × 5 in films can be projected directly in a lantern

Contact print made direct from 4 × 5 in cut film (actual size)

GENERAL MEDICAL COUNCIL

SESSION NOV 28–DEC 2

After hearing the President's address, reported last week, the council considered a heavy calendar of penal business

Disciplinary Cases

The council did not direct the Registrar to erase from the Register the name of *Mrs Ethel Grundy Toward*, registered as of Brookside, Durham Road, Birtley, co Durham, M B Durh (1925), who appeared for postponed judgment

John William Paterson Collier, registered as of Holm Lea, Church Road, Yapton, Sussex, M B Edin (1922), was charged with having called at or about 12 20 A M on April 9, 1949, at the house of Gladys May Hitchman to attend an infant, when under the influence of alcohol to such an extent that his professional judgment was impaired Information in the case was received from the Minister of Health Mr Harold Brown, instructed by the solicitors to the council, presented the facts and Dr Collier was represented by Mr Gerald Howard, K.C , M P , and Mr J MacGregor, instructed by Messrs Hempsons, on behalf of the Medical and Dental Defence Union of Scotland

Consideration of this case had been postponed at the May sitting owing to the illness of the district nurse who was to have given evidence Opening the case at the present session, Mr Brown stated that the nurse now refused to give evidence

Mr Herbert Hitchman said that he and his wife were on the list of Dr Collier On April 7, 1949 his wife was delivered of a male child Dr Collier was in attendance On the evening of April 8, his wife and he noticed that the baby looked "very sick." Soon afterwards the district nurse examined the baby, and asked Mr Hitchman to telephone to the doctor After several calls he was told at 11 30 P.M that the doctor had been contacted at Bognor and was on his way Dr Collier arrived about 12 15 A.M and, said witness, "he looked very the worse for drink." After Dr Collier left, the nurse told witness to telephone Dr Collier s partner, who came about 1 A M The baby was then dead Mr Hitchman afterwards communicated with the executive council for East Sussex Witness agreed that Dr Collier still attended his family, and that Dr Collier normally had a fairly high colour and was abrupt in his talking and movements

Mrs Gladys May Hitchman examined, said that when Dr Collier came, after midnight, he staggered into the room, and flopped on to the bed ' Just by looking at him you could tell he had been drinking The way he examined the baby did not seem right He tapped the baby s chest Asked what Dr Collier said after the examination, witness replied ' He said it was perfectly all right ' He wiped his hand round the nurse s face and said That s all right, nursee '

The first witness for the respondent was his host at the party at Bognor There was nothing in Dr Collier s behaviour, the witness said to suggest he was drunk. When he was called away he came to witness to apologise because he had had an urgent call and had to go Two other guests said that there was nothing about Dr Collier on this evening to suggest he was the worse for drink.

Dr Collier in the witness box, said he saw the child at birth and on the following morning when he made a full examination. Mrs Hickman whose first baby had died, was extremely worried about this infant who was premature He made a careful examination not because the child appeared ill but because he seemed weak , he found nothing clinically wrong In the evening the baby was blue and breathless, but apparently no more ill than when he saw him in the morning Describing his method of examining the chest he said he used the method of alternate percussion on fingers and the chest which Sir Robert Philip had taught him to use in young children When he heard that the child had died he was not surprised because it was a sickly, premature baby He had no recollection of rubbing his hand over the nurse s face He gave the cause of death on the death certificate as congenital atelectasis Cross-examined, he said that he was not surprised at the baby s death but he did not expect it to be sudden He did not tell anybody in the house that it might be imminent He told the nurse that he could find nothing wrong with the baby He did not know that the nurse had sent for his partner until he had heard the evidence In reply to a member of the council who asked why he gave a death certificate if he could not find anything wrong on clinical examination, Dr Collier replied that he gave a post-mortem differential diagnosis

The council found the facts alleged against Dr Collier not proved to their satisfaction

AN "UNEXPECTED VERDICT"

A doctor was charged with having been convicted in 1949 of committing an act of gross indecency with a 14 year-old boy, for which he was sentenced to 12 months' imprisonment Mr Winterbotham presented the facts and the doctor was represented by Mr Harold Brown, instructed by Messrs Freeman & Son

During the hearing Mr Brown recalled that it was held in the Spackman case that the council could not go behind a conviction , but this was not an ordinary case As the Lord Chief Justice had said, in judgment in the Court of Criminal Appeal, the trial judge would have preferred a verdict of acquittal Giving sentence he had said "I do not agree with that verdict and I do not understand it ' Mr Brown submitted that even if the council could not go behind the conviction, if they were presented merely with the bald fact of the conviction, they would be incompletely armed with the relevant facts If, for instance, in a trial there were gross irregularities and an appeal was not put forward, he did not think the council would be debarred from going into those circumstances He submitted that the surrounding circumstances were a matter for the consideration of the council

The family of the boy, Mr Brown said, had continued as patients of the doctor for months afterwards and neither parent said a word to him As the judge had said "Can you believe the parents believed that boy s story ?" When the matter came before the Court of Appeal the Lord Chief Justice thought it so important that he ordered it be heard before a full court of five judges The appeal was dismissed on the grounds that the court could not interfere with the verdict of the jury

The boy had not been treated by the doctor, though he was on the doctor's list The point might arise on some occasion whether being on a doctor s list constituted a professional relationship , Mr Brown submitted that there must be something more

When the doctor gave evidence, Mr Brown said he wished to ask him whether he was in fact guilty, but the legal assessor advised the council to rule against the question Mr Brown then asked if the doctor had at all times maintained his innocence ' I have, ' he replied Since his release he had resumed practice in the same district, and now had 1600 patients on his list The boy had not been on his list but on his partner s Evidence of character was given by a colleague who had been a fellow student, and by two patients

The council found that the doctor had been convicted of the misdemeanour, but did not direct the Registrar to erase his name from the register

The council directed the Registrar to erase the name of *Illtyd Gwyn Williams*, registered as of Ravenscourt, Tynewydd Road Barry, Glamorganshire, M B Edin (1923) He was found to have had intercourse with a woman (the complainant) when he stood in professional relationship with her

ALLEGED CANVASSING

Eugene Wlodzimierz Collis registered as of 183, Woodstock Road, Oxford M D Vilno (1937) appeared before the council on two charges of canvassing Dr Collis had bought the house but not the practice, of Dr Harper, of Oldbury

The first charge alleged that he canvassed patients of the practice of Dr G G Cooke of Oldbury and the second alleged that he canvassed patients of the practice of Dr Jack Lockley, Dr Reginald Morris Howson, and Dr Hazem Barrada The complainants in the case were Dr Howson and Dr Barrada

Mr Benjamin Sadler gave evidence that last December he wanted glasses At the time he was registered with Dr Harper and he went to Dr Harper s surgery, where he saw Dr Collis Witness admitted that he went to that house because that was where Dr Harper lived

Sir Sydney Smith Did the doctor say that you could not get glasses from him unless your wife also was put on his list ? — No

Mr Benjamin Griffiths said that he went to Dr Harper's surgery when he had flu he had been a patient of Dr Harper s all his life He found Dr Collis there, who examined him and said he was the new doctor Witness asked if he could be put on Dr Collis s list and he said "Yes certainly ' He did not know until he got home that his family were

3 *Infections in which there is no satisfactory evidence of the therapeutic value of chloramphenicol*
Influenza
Common cold
Poliomyelitis and polioencephalitis
Tuberculosis
Syphilis
Ulcerative colitis

Chloramphenicol is probably effective in a number of pyogenic infections, such as bacterial pneumonias, gonorrhœa, and peritonitis, but it is doubtful whether it is as effective as penicillin or sulphonamides In bacterial endocarditis due to organisms which are penicillin resistant, chloramphenicol is probably inferior to a combination of streptomycin and penicillin An exception to this is bacterial endocarditis due to penicillin-resistant *Staph pyogenes*, for this, as for any severe penicillin resistant staphylococcal infection, 'Aureomycin' is the antibiotic of choice

It should be noted that chloramphenicol in the powdered form has an extremely bitter taste It is not, therefore, easily administered to young children who will not swallow capsules

MEDICINE AND THE 1951 FESTIVAL OF BRITAIN

LAURENCE DOPSON

ON the South Bank exhibition site, the pavilions are now taking recognisable shape in preparation for the opening of the Festival next May The site is divided by the arches of Hungerford Bridge, but the two sequences of buildings thus formed are to tell different parts of the same story The theme of the whole is Britain's contribution to civilisation, past, present, and future, particularly as seen in science, technology, and industrial design Within that theme the exhibits in the up stream section, west of Hungerford Bridge, will be concerned with The Land, or the environment which has influenced and in turn been influenced by British contributions The exhibits in the down stream sequence between Hungerford Bridge and Waterloo Bridge, will deal with The People—i e, with what the British people have achieved Medical contributions take their place where appropriate in both sequences Thus British contributions to tropical medicine, biology, and some aspects of physiology are to be included in the Dome of Discovery, which will be devoted to British exploration and discovery in all fields—terrestial, oceanic, geological, physical The more personal aspects, such as the work of Harvey and others on the circulation of the blood, are featured in a pavilion in the down-stream sequence where the general theme of health is illustrated

A council has been formed to advise the Festival Organisation on the proper representation of British achievements in science and technology, and one of the members is Dr H P Himsworth, Secretary of the Medical Research Council A medical sciences advisory panel has also been set up, and Sir Sheldon Dudley, F R S, has acted as medical adviser The executive officer for the health section is Mr N B Clayton

HEALTH PAVILION

In the Health Pavilion which stands partly under Waterloo Bridge, the theme will be the health of the individual and the health of the community As he goes in, the visitor will find an introductory section describing the body and its functions For instance, the explanation of the nervous system given here, and the contributions of such men as Sherrington, will help the lay visitor to understand the later section on neurology Similarly, the section on physiology of the blood which begins with Harvey's discovery of the circulation, will provide a link to succeeding sections

In the introductory section, the general description of nutrition will prepare the visitor for the next part, on the maintenance of health, where, as an example of applied nutrition, will be illustrated community feeding as developed in Britain in the late war The public health services, in which the British sanitary reformers led the way, will mainly be shown in relation to clean water supply and sanitation, but there will also be a small exhibit on air hygiene and the prevention of atmospheric pollution In this way the two aspects of health are exemplified—the individual by good diet, the community by public health measures Mass immunisation, biological standardisation, and vital statistics will also be illustrated

Turning from health to sickness, the visitor will learn something of Britain's contribution to therapeutics, to neurology, and cardiology, and this section will lead him naturally to the next—the introduction to surgery Here he will be shown how modern surgery depends on asepsis and anæsthesia, based on the work of such men as Lister and Simpson Blood transfusion and the work of the National Blood Transfusion Service will also be explained, and the visitor will learn something of the part that Britain has played in developing thoracic, orthopædic, and plastic surgery He will be shown how burns are treated today according to British practice in asepsis, and this will link back through the danger of infection, to air hygiene Through the exhibition there will be stimulating cross references of this kind, to show how the story of health and disease is interrelated

The survey of surgery will be interrupted to tell the story of nursing Here the Nightingale tradition of treating the patient as a person and of concern for the comfort of the patient, which is characteristic of British nursing, will be emphasised

The importance of environment to health is further demonstrated in the section on homes, which will emphasise the family unit, and on school buildings

OTHER SCIENTIFIC EXHIBITIONS

As a corollary to the South Bank exhibition, an exhibition of science will be held on the ground floor and basement of what will afterwards be the new west wing of the Science Museum in South Kensington Here, as at the South Bank exhibition, modern methods of presentation will be used The exhibition will not be arranged in conventional museum fashion, with small specimens laid out on benches and in glass cases Written explanations will be cut to a minimum, and the displays will be largely visual and three dimensional The main theme will be the spirit of scientific discovery and recent advances in knowledge of the structure of matter and fundamental processes There will, for example, be models showing the structure of sugars, fats, and proteins, and models and photographs to demonstrate cellular formation and differentiation a final section will be devoted to current research Some medical exhibits, inappropriate to the South Bank exhibition will be found here Cancer research, for instance, is included in the exhibit showing the structure of matter

In the specially converted aircraft carrier *Campania*, a small travelling version of the South Bank exhibition, including the health section, will tour the ports and seaside towns of the United Kingdom

All these exhibitions are designed for the intelligent lay public The specialist will also be catered for by the appropriate learned body The Royal Society of Medicine, for instance, is arranging for visiting doctors a series of addresses appropriate to the Festival theme during the summer of 1951, and medical museums in London will probably be staging special exhibitions The British Association has arranged that its 1951 meeting in Edinburgh shall form part of the Festival

charged with having been convicted at the Tower Bridge magistrates' court on March 13, 1950, of receiving two suitcases knowing the same to have been stolen, for which he was fined £20 and £10 10s costs The council's solicitor presented the facts, and the respondent was represented by Mr N Leigh Taylor of Hempsons, solicitors, instructed by the Medical Defence Union

In evidence, Dr Sack said that to control nervousness and excitability he had been in the habit of taking 'Sodium amytal' at first 3 g a day On the day in question he took 24 g He had visited the offices of the Medical Defence Union in the afternoon, and Dr Robert Forbes, the secretary, gave evidence that he had made a note at the time of Dr Sack s visit that his demeanour appeared to be that of someone under the influence of a drug he was now quite different Mrs Sack said that her husband was now quite free from any influence of drugs, and a certificate from Dr G W B James under whose care he was admitted to hospital for treatment after the conviction, was read

After consideration in camera, the President said the council found the conviction proved, but had decided to postpone judgment for a year

William Melrose, registered as of 15, St Paul's Square, Liverpool, L.R.C.P.E (1924), was charged with having been convicted at Liverpool City magistrates' court on July 14, 1950, of being found drunk for which he was fined 10s After consideration in camera, the president announced that the council found the conviction proved This was not the first time respondent had appeared before them, and they were bound to take a serious view of a further conviction. Judgment was postponed for two years

RESTORATIONS

The president announced that the Registrar had been directed to restore to the Register the names of *Gerald Donagh Flatley*, *Henry Charles Coutts Hackney*, and *William Hamilton*

Business of Council

The President introduced the report of the Pharmacopœia Committee, of which he was appointed chairman in place of the late Professor Dilling The British Pharmacopœia Commission, 1948–53, had, he said, unanimously recommended that the main titles of the monographs in the 1953 *British Pharmacopœia* should be stated in English

> "It is proposed that Latin titles should not be coined for new monographs It is also proposed to alter the sequence of the monographs by placing preparations such as tablets, injections, and tinctures immediately after the parent substance, instead of grouping the preparations on a pharmaceutical basis, such as Tabellæ, Injectiones, and Tincturæ '

In view of these proposed changes, the Commission thought that the monographs in the *Addendum* dealing with preparations of human blood should appear as a separate section with titles in English "It is felt that no useful purpose would be served by inventing Latin titles for these monographs"

An extra sitting of the council, to consider disciplinary and other business, including educational, will be held in February, 1951

Disabilities

55 FRACTURE OF THE SPINE

It all came of trying to help with the chores I had just finished dressing and was going down to the kitchen when my foot slipped on the top of four steps Involuntarily I jerked my whole body forward, and in the split second that I was suspended in mid air I felt a terrific rending and crunching sensation right across my middle As I collapsed in a heap at the bottom I knew beyond the slightest question that I had fractured my spine I was frightened to death Could I move my toes? Well—I knew I'd got to face the music sooner or later, and it had better be now I tried to waggle them They waggled That was one of the best moments of my life By this time my son was enjoying a good laugh at my expense and my wife had arrived on the scene

'I've done it this time," I said "I've fractured my spine But it's all right I think you'd better call the ambulance" Then I passed out

When I came to, I was cold and drenched with sweat The doctor from next door was bending over me, he went, gladly enough, to invite an orthopædic colleague to come round The others gave me a hot water bottle and heaped rugs on me My resuscitation was fairly rapid, and with it came a curious sense of well being so that I felt inclined to get up and welcome my visitor at the door But I lay where I was, wondering whether I ought to be turned on my face or my back. The ambulance was already waiting when the orthopædic surgeon arrived "Never mind," he said, 'we'll soon get you to the hospital and see what you've done" There was no room in the little lobby where I lay for the ambulance men to do a textbook lift They heaved me up, a little unceremoniously I thought, and turned me on my back on to a stretcher with a rolled up blanket across its middle But as long as I was conscious and my back muscles were all in a good state of spasm it probably didn't matter

At the hospital I was taken straight to the X ray department where they were waiting to receive me The radiographer wasn't worried by fractured spines "Now turn on your side," she said as cheerfully as if I had nothing worse than a pint of bismuth inside me and like a lamb I turned Soon afterwards the radiologist appeared from the dark-room "You're quite right," he said "Its the body of D12 that's gone, but it's quite a good position" And with that I was taken to the ward and put to bed with a hard pillow under my middle

Hours passed My exultation was over, and I was beginning to feel under the weather again I thought of my days as a casualty officer when I had reduced all manner of fractures, fixed the limbs in cumbersome splints, and sent the victims home without so much as an aspirin My remorse grew on me If only I'd done this before I had that job, how different my behaviour would have been, I'd have treated my patients and not only their fractures Just then the medical superintendent came in "Are you comfortable?" he asked. "Well, I suppose I am," I replied, "if you're using the word in the hospital sense" He took the hint, and in a few minutes a nurse came along and gave me an injection The hours passed but I lost count of them, and at last the nurse came and gave me another injection and off I went to the plaster room There I was arranged with my chin on one table and my shins on another while a trolley supported my middle My torso was adorned with strips of felt, and when all was ready the surgeon said "Now, I want you to hang on just like that when we take the trolley away" I dug my elbows into the front table, off went the trolley, bang went a slab of warm wet plaster into the small of my back, and in an instant three pairs of hands were bandaging, rubbing, and slapping plaster all round me It all seemed to be over in an incredibly short time, and then I was helped to my feet and one of the girls trimmed me up and cut a window in the front They took me back to the ward and left me to dry with an electric cradle over me

What happened after that I never really knew I remember vomiting from time to time—a difficult thing to do decently when you are lying flat and cannot move In the intervals I felt I was cooking slowly, but for the greater part of the time I did not know what was going on, either because I fainted again or because I fell into a drugged stupor But there was no stupor about me next morning Indeed I was only too wide awake, and the next three days were a positive nightmare of a well

registered with Dr Barrada His wife went up to Dr Collis and told him, and Dr Collis said "That's all right I've bought Dr Harper s business, and it's only right I should have you

Mrs Cutler said that she was a patient of Dr Barrada Her husband had been a patient of Dr Harper, and she went to Dr Harper s surgery and asked Dr Collis to call Dr Collis said "Why not have one doctor ?" She thought he wanted her on his list When she later gave him only her husband's card, he said "Just the one ?" and she said "Yes"

Mrs Fletcher said that her baby was on the list of Dr Barrada Dr Barrada said he could not circumcise the baby privately unless it was transferred to some other doctor s panel, and she arranged to have the child put on Dr Collis's list In reply to Sir Sydney Smith, witness said Dr Collis did not ask her directly to have her name placed on his list, but he said that if they were satisfied with the way he had treated baby, and she and her husband wanted to change, they would have to sign the form

Dr Collis, in evidence, said that he put an advertisement in the *British Medical Journal*, as a result of which he purchased Dr Harper's house Nearby was the house of Dr Cooke, who was carrying on the practice Subsequently Dr Cooke told him that he wanted to retire and that his partner saw no objection to Dr Collis taking over the practice Witness had a conversation with the chairman of the executive council, who said he saw no reason why he should not succeed to Dr Cooke's practice, but that he was to treat this conversation as confidential and should not say anything of it to Dr Cooke or his partner Dr Collis formally applied to take over the practice and received a letter from the clerk to the executive council, as a result of which he engaged an assistant and got a car Mr Griffiths told the witness he was a patient of Dr Harper's, and was Dr Collis Dr Harper's successor ? Witness said that he was not Mr Griffiths said he wanted to be on Dr Collis's panel Asked by his counsel whether he ever tried to persuade Mrs Cutler to come on his list, Dr Collis replied "On the contrary She asked me several times, and several times I sent her back to her own doctor '

In answer to Sir Henry Cohen, Dr Collis said that, having started from scratch, he now had a list of 1800 patients Oldbury was a small place When Sir Henry asked if it was likely, in view of the proximity of the other practitioners, that it was from those practices that his patients would have come in some numbers, Dr Collis replied "Yes, it is likely"

After deliberation in camera the president announced that the council had found the facts not proved to their satisfaction

"GESTAPO METHODS"

Florence Joseph O'Driscoll, registered as of 43, Moss Lane Liverpool, M B N U I (1928), appeared before the council charged with infamous conduct in that

'On May 31 1950 you were so far under the influence of drink that you were incapable of properly carrying out your professional duties towards your patients who were waiting to consult you at your surgery, at 43 Moss Lane Liverpool and in particular were incapable of rendering any proper and necessary treatment to Mrs Doreen Shone one of the said patients

Information in the case was received from the Chief Constable of Liverpool Dr O Driscoll was represented by Mr D Braben Mr Howard, K C, M P, and Mr MacGregor instructed by the council s solicitors, appeared to state the facts Mr Howard, opening the case said that Mrs Shone was not present, and the only evidence would be that of two police officers

Inspector James Smale said that on May 31 in response to a telephone message he and Detective Sergeant Alfred Metcalf went to 43 Moss Lane Liverpool The door was answered by the doctor s brother, who said the doctor was seeing no more patients Witness explained that they wanted to see the doctor privately He stopped the brother from closing the door, and the doctor came to the surgery door He was leaning on the casing to support himself When witness told the doctor of the complaint Dr O Driscoll said 'Let s be having some names' When the inspector replied that he was not in a position to give the name, the doctor said some thing of which witness caught the word "Gestapo" His breath "smelt of spirits' The inspector said he would like to see his brother Dr O'Driscoll said his brother was not in The officers went upstairs and found the brother standing on the landing Told that he should see no more patients, Dr O'Driscoll said "I will always take good advice" He asked the two men in the waiting room to leave, and then the officers left Cross examined, witness agreed that his notes were sketchy Asked if it was right that he or the sergeant looked through the waiting room window, witness replied it would have been impossible to do so He agreed that he asked the doctor his age, whether he was the tenant of the house, whether he was married The doctor's answers were all "thought over" He did not ask the doctor how many drinks he had had "I could see he had had too many' Inspector Smale agreed, in reply to the Legal Assessor, that if no complaint about dangerous drugs had been received, he had no right to go into the house Witness told Sir Henry Cohen that the doctor had seemed "bemused" Sir Henry pointed out that he asked for the name of the complainant, which was reasonable

Detective Sergeant Metcalf, in evidence, said the doctor adopted an "aggressive manner" He produced his pencil "with a flourish" and said "Let's be having some names" He considered the doctor was under the influence of drink and was unfit to deal with patients Cross-examined, witness said the inspector did look into the waiting room window before they went into the house Asked about what right he had to be in the house, witness agreed that they were on "rather delicate ground," but "We were never told we couldn t come in"

Dr O'Driscoll, in evidence, said that Mrs Shone was a panel patient to whom he was giving antenatal treatment When she came to his surgery on the night in question, he called her Mrs Davenport in error, Mrs Davenport was another patient, also pregnant, who lived at the same address. He apologised Describing what happened when the police officers visited him, Dr O'Driscoll said that when the detective sergeant suggested he should close the surgery he refused When they said they wanted to see his brother, he called him, and getting no answer, said "He has apparently gone out, you can look for yourself" He told the police he had had one drink of beer that day He thought the officers had forced themselves into the house, and to justify themselves were going to make out the charge of drunkenness In answer to Sir Henry Cohen, Dr O'Driscoll said his surgery had been open from 5 30 to 7 P M, and he had seen about a dozen patients "Had you any complaints from those patients ?'—"None whatever"

Mr R W Varning, a school teacher, said he and another man were in the doctor's waiting room, and he saw the plain clothes man look into the window The officers left before he did There was no smell from the doctor, and there was nothing about him to indicate that he was not sober He gave witness a prescription, which witness read without difficulty Dr Joseph Mackin gave evidence of having visited Dr O'Driscoll on the same evening and having noted that he was perfectly sober Dr O'Driscoll s married stepdaughter also said that the doctor was quite sober

Mr Braben addressed the council on behalf of Dr O'Driscoll, and Mr Howard said he did not wish to reply After consideration in camera for only about a minute, the President announced the council had found the facts alleged not proved to their satisfaction.

ADDICTION OFFENCES

Nigel Harold Maurice Russell Monro, registered as of 442, Nell Gwynn House, Sloane Avenue, London, S W 3, M R C S (1936), was charged with having been fined £20 at Ashford magistrates' court in 1947 for offences concerning failure to enter dangerous drugs in a register with being fined for insulting behaviour and assaulting a police constable later in 1947 in London, with having been convicted on July 11, 1949, of being drunk and disorderly and assaulting a police constable, and of having been convicted at the Central Criminal Court in November, 1949, of occasioning bodily harm to Wendy Joan Monro, for which he was sentenced to twelve months imprisonment Mr Winterbotham stated the facts of the cases, and said that the Home Office had withdrawn Dr Monro s licence to obtain drugs After deliberation in camera the President announced that the council had found the convictions proved, but in view of the testimonies from his patients they had decided to postpone judgment for two years

Eric Leonard Neil Shoeten Sack registered as of 64 Trinity Court Gray s Inn Road London W C 1, B M Oxfd (1945), was

In England Now

A Running Commentary by Peripatetic Correspondents

My friend the psychologist has just bought a radiogram (No, no! I don't mean an X-ray film—a wireless phonograph) She may not be able to mend a fuse but she is *au fait* with the latest work on electronic brains, so she approached her new companion with more respect than many people would have given it It had one of those automatic record changers and she found it a little upsetting after her previous homely one with its broken handle and unpredictable clockwork The music-click whirr-plop whirr-music sequence hinted at a considerable amount of thoughtful effort inside, and she used to sit trembling with anxiety after each side ended, wondering how long this dark-skinned monster would be content to crouch in its corner whirring, clicking, and plopping in the right order

Last week the inevitable happened The machine took a fancy to the beginning of the second movement of the Eroica It played the passage through and then began again The sad music boomed ominously round the flat Then to her horror it began for the third time What was she to do? Should she become a dominant mother figure and whack the machine on its flank? Or perhaps stroke it and try to develop a transference? Eventually she decided to emulate Fabre with his wasp and let it go on for seventy-five (or was it a hundred and seventy-five?) times to see if it would learn The fifth rendering saw her own nerves in no good shape, but being a good psychologist she clenched her teeth and carried on Soon after this the machine got really obsessional and its needle stuck in a groove Compulsive outbursts were obviously only a matter of time, so she packed a bag and spent the night at the hospital Now she is in a sorry plight She would like to phone her flat, but who—or what—might answer?

* * *

I know the answer to the flying saucer problem It came to me when I read an article by Mr Fred Hoyle saying that relativity would enable us to travel in a high-speed rocket for a month by rocket time and return to find the earth several thousand years older by earth-time Obviously the saucers do not come from another planet at all but from our own Ages ago, when science had got a bit further on than we are now, some people set out in saucers for a month's pleasure cruise in space Soon afterwards the people left behind blew themselves up with atom bombs Then civilisation began again, and now the saucers have just got back. So far they haven't landed, but when they do get a good look at their children they will certainly beat it, at the speed of light, for another million years So I have packed a suitcase and if I see a strange blue light in the sky I shall thumb a lift

* * *

If *The Men* had been made by Ealing Studios there would perhaps be more laughs in it, and, paradoxically, it would be more moving Somehow we have a better knack of putting across the semi documentary film than the Americans Stanley Kramer has set his picture in a genuine hospital for soldiers with paraplegia and has been scrupulous about the medical details The film shows well the modern treatment of paraplegics, refers openly to their bladder and bowel troubles, and gives an energetic picture of reablement in the magnificently appointed gymnasium and swimming-bath Extra power in the arms and torso is an essential preliminary to life in a wheel-chair, and these young men set about the job seriously—too seriously, the boys at Stoke Mandeville would say The only time they looked really cheerful over it was in the swimming-bath, where they sailed round with their seats wedged into rubber-rings, the rest of the time—lifting larger and larger dumb bells till they reached the sort usually reserved for strong-man acts—they were as solemn as prep school boys in training for the sports In contrast, the backchat in the wards had the genuine flavour of cheerful cynicism

All in all, the film deserves high marks on the technical aspect, but it broke down lamentably at the love interest level The American girl, it would have us believe, gazes at her paraplegic boy-friend with a look of steadfast sorrow, pursues him with guilt-provoking fidelity, and waits for the wedding night to tell him it is all going to be too much for her, while mamma, though she has had a year or two to get used to the prospect, makes her boy's first visit home a misery by crying audibly in the next room every night As a rule the paraplegic's fiancée and family have so little hope at the start that they hail every sign of their man's growing independence as marvellous, and when he leaves hospital able to live an almost ordinary life they are as proud as if he were a winner in the Olympic Games But in any case a paraplegic who is out to pull his weight is not a liability but an asset in the home, like the head of any other family

* * *

I regret to say that I have been up before the Bench on an alleged technical offence, though fortunately for my local reputation the case was dismissed While waiting in the yard of the court-house I had ample opportunity to study the cross section of humanity found in such places, of which I now formed a part It was a bumper day for the court, because a gang which had plagued the county for a year or more, stealing chickens and anything else it could get, had been rounded up It did not altogether surprise me when a man who lived next door to my home proved to be a member of this gang, and he greeted me warmly as we waited for our names to be called. What the B B C would term the "quickies" were disposed of first, and I emerged a free man During the afternoon rumours began to circulate about the fate of the gang and the sentences its members were receiving, and I wondered how many months would elapse before my neighbour was again working in his garden I need not have worried, for late in the evening, when I was taking a walk, my neighbour hailed me, only slightly subdued, from his gateway "That was a bad do today, doctor," he remarked, "they caught me for fifty quid' How should one reply on such an occasion? To sympathise would be to condone the offence, to say he was lucky not to be in the county gaol would hardly be tactful. I could only agree lamely that it *had* been something of a do, from all accounts, whereupon, fortunately, he launched into full details and was satisfied with my yeses and noes

* * *

The other morning I stumbled over an up turned potty as I hurried through the front door, late, as usual, for work It struck me at the time as a little unusual, but being, like most registrars with family responsibilities, distracted by the cares of this life, I gave it no further thought until the same thing happened on the second and again on the third mornings By then I thought I must take the only likely offender—to wit, my son (aged just four)—severely to task Guarded questioning brought only the soft answer and a smooth turning of the conversation to the type of train now to be seen across the field, and a firmer approach resulted in sulkiness, tears, and, no doubt, feelings of guilt I became worried Was this, I asked myself, the EGO or the ID? What ghastly and be it-ever-so-slightly deep seated complexes were at the root of this highly abnormal behaviour? Field observation, I told myself, was the first step, and next day I was up early to gather more information What I had failed to observe was that he is 6 inches too short to reach the Yale lock on the inner door, but the potty made all the difference "Aren't I a good boy to bring in the *Times*?" he observed

* * *

In my country (*not* England now) the anæsthetists are taking the lead in the surgical departments When our chief anæsthetist told a younger colleague the other day, "I have four surgeons working for me," he wasn't far wrong Their apparatus is getting so big and complicated that it takes two or three anæsthetists to work one machine and there is hardly room for anything else in the theatre Their latest whim is to give every patient continuous oxygen therapy for some days after operation I have suggested that the patients might take their oxygen masks home with them to amuse the children

known B B C lady crooner, over heating in the E M S hut, and physical discomfort To begin with I couldn't breathe I began to realise what it must be like to have asthma, and to make matters worse I had developed a cough with tough plugs of mucus and couldn't get enough air into my chest As if that wasn't enough my intestines seemed to have thrown in their hand and to be swelling out of all recognition The night nurse had views on treatment "What about some linctus," she said, "and a little mag sulph ?" "I don't mind the linctus," I replied, "but I draw the line at mag sulph It isn't that my guts won't work they can't, and it's no use being unkind to them" By the next night I was as tight as a drum but as pig headed as ever

The third day was the worst It is true the shortness of breath was better, but my abdomen was sticking up out of its window in a most sinister way I regarded it tenderly as a motorist would an inner tube beginning to bulge out of a worn cover, with no spare wheel and a mile to go home When the night nurse came on duty I surrendered unconditionally What use are theories in treatment ? I spent a disturbed night, but next morning awoke completely deflated and for the first time in four days was able to face a meal

A visitor the day before had said I looked "ghastly" Now things were different I had only to lie in bed and enjoy being incapacitated I settled back comfortably to make the most of it But not for long A young physiotherapist came into the ward and proceeded to put its occupants through their paces I tried to avoid her eye, but it was no use "Ha," she said "I see you're better Time you began your exercises You can come to the physiotherapy hut at 2 30" And I went She was quite right, if I was to regain my muscular efficiency I'd got to work for it

At the end of the week I went home Trying to lead a normal life in a plaster case presented all sorts of unexpected difficulties At first quite slight exertion brought back the difficulty of breathing almost as badly as before, and even concentrating on abdominal respiration did not help, but this trouble lasted no more than a month The other disabilities were there as long as I was in the thing If I sat down, my thighs pressed on the lower edge and levered the whole jacket up, so that if I didn't keep my head vertical the upper projection jabbed me in the Adam's apple Reading and writing became difficult and so did eating, while drinking soup from a spoon was almost impossible Do you realise how many times a day you go through the motions of picking something up from the floor ? I never did till I found I couldn't do it But I evolved a special technique of locating the object, putting the outside of my heel against it, doing a double knees bend, and then feeling straight down with my fingers Of course I couldn't bathe, but that was one of the lesser evils What was worse was the difficulty of drying when I had got really hot inside my shell In the end I found the solution in an electric hair-dryer I would retract myself as far as possible within my case, blow hot air around till I was dry, and then finish off with a delightful draught of cold

All this time I was keeping my muscles in trim by doing regular exercises at home, and three days a week in the hospital using the special apparatus there Some of these exercises, such as lying across a bed with my heels held, bending down till my head touched the floor, and then coming up to the horizontal again, looked much more difficult than they really were The only one I found at all exacting was walking along a 2 in bar of wood raised a foot off the floor, I felt as if I was balancing on the parapet of a house But what was most difficult of all was sustaining my interest in the ritual Perhaps this is not so bad where there are a lot of people with the same disability so that the competitive element creeps in, but when you are alone there is often a strong inclination not to bother with it for once—and if I didn't bother once I knew I should be lost I was determined to get better, and I was prompted by fear of what might happen if I didn't "A good many people find it worse coming out of plaster than going in," the experts told me, "and it's because their muscles aren't equal to it" So I flogged away at the exercises and invented others of my own As I sat at my desk, I developed the power of contracting my trunk muscle individually, feeling them press against the plaster as they came into action In my imagination my umbilicus was a movable object, and I made it go round and round, first clockwise and then anticlockwise, like the tip of a minute hand

By the end of the twelfth week either I was getting thinner or the plaster was stretching, anyway I was beginning to rattle about inside it like a nut in its shell About the same time, too, I became aware of a constant gnawing pain through the middle of my right chest that made me want to free myself and have a good stretch. At last, at the end of another fortnight, the great day came and the plaster was cut off I half expected to collapse like a jelly on the floor, but nothing of the sort happened On the contrary, I never felt so firm and fit for action in my life The other unexpected thing was that the pain in my chest grew worse for two or three days, after which it gradually disappeared Today, nearly three years after the accident, I have a wedge shaped vertebra, perfect function, and complete freedom from any unpleasant sequel

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis during the week ended Nov 25 were paralytic 111 (111), non-paralytic 19 (39), total 130 (150) The figures for the previous week, compared with which there was a total decrease of 20, are in parentheses Uncorrected notifications for the corresponding weeks in 1947 and 1949 totalled 145 and 193

Total uncorrected notifications for 1950 to and including the week under review are 8251 The corresponding figures for 1947, 1948, 1949, are 8821, 2212, and 6327

Smallpox not Confirmed

A coloured student resident in a hostel in Chelsea, London, was removed to Long Reach Smallpox Hospital via the Brook Hospital, Greenwich, on Nov 28 Laboratory investigations and further clinical developments have now removed all suspicion of smallpox.

Infectious Diseases in England and Wales

Disease	Week ended Nov			
	4	11	18	25*
Diphtheria	40	55	70	61
Dysentery	260	411	474	636
Encephalitis—				
Infective	7	1	2	4
Postinfectious	1	2	3	1
Food poisoning	130	144	215	151
Measles excluding rubella	7821	8857	10,139	11 343
Meningococcal infection	32	26	33	37
Ophthalmia neonatorum	35	26	38	45
Paratyphoid fever	5	3	1	7
Pneumonia primary or influenzal	433	465	558	490
Poliomyelitis—				
Paralytic	149	161	111	111
Non paralytic	57	64	39	19
Puerperal pyrexia and fever	59	82	67	48
Scarlet fever	1112	1206	1387	1463
Smallpox				
Typhoid fever		3	5	3
Whooping cough	3008	3725	4152	4334

*Not including late returns

the local pool for remuneration of general practitioners in addition to creating ill feeling between different groups of the profession, particularly where the ex registrars appointed as clinical assistants would be seeing their colleagues' cases referred to hospital

The flooding of the general practitioner market with 1100 redundant registrars will, of course, be most convenient for the Ministry, which is at present engaged in opposing general practitioner claims for an increase in the central fund for payment of capitation fees No proposal has been put forward for increasing this fund from the money saved by dismissing these 1100 registrars

The suggestion (in paragraph 12 of the circular) that boards should send a polite letter to dismissed registrars was regarded as merely adding insult to injury

The desirability of the necessary cuts in registrar establishments taking place gradually was realised, and it was pointed out that the extension of senior registrar posts for a fourth, fifth, or even a sixth and subsequent years would not only alleviate individual hardship but would reduce the annual recruitment and retirement of registrars and so allow the temporary maintenance of establishments above the proposed level without further perpetuating the disproportion between registrar and consultant vacancies As an example, the 28 senior registrars calculated as indicated for the Welsh region on the basis of 3 year tenure could be 36 or 37 on a 4 year average tenure, and this increase would *particularly benefit the non teaching hospitals*, whose work and patients will undoubtedly suffer if the proposed radical cut is introduced

G R VENNING
Acting Secretary
Welsh Regional Registrars Group

Cardiff

SIR,—There is a strong argument for reducing the number of trainee specialists while there are few consultant posts falling vacant each year On the other hand, the Ministry of Health encouraged numbers of us to take up specialist training with the promise of an increase in the number of consultant posts under the National Health Service, and it was recently reiterated in Parliament that the country was far short of the numbers required That these posts will not be created for some time has been apparent for the past year at least, yet without prior consultation with any representative medical body, the Ministry have swung the axe

Laments by the small number of registrars are less likely to be heard than those by general practitioners or consultants, and we are looking to these groups for support, if only against the methods used, which might later be applied to any other branch of the profession

ANOTHER REGISTRAR

SIR,—The answer to the problem of the registrars is simple and widely agreed upon amongst the profession The number of consultant posts must be rapidly increased to the figure which the Minister has previously held to be necessary Registrars must take action to ensure that (1) the memorandum shall be frozen until discussions with the profession have taken place, and (2) the Minister explains why he is unwilling to solve the problem by making more consultant posts Is it because of economic or political considerations? Or is it, as some would believe, due to the resistance of the present consultants?

If the Minister can give a valid reason for his attitude, then registrars must coöperate with him in solving the problems that will face them But surely they must know this reason first And until then they should not discuss with him the alternative methods of solving the difficulty

Middlesex Hospital London, W 1 CECIL MCIVER

SIR,—May I suggest that one solution to the registrar problem is the reintroduction in surgery and medicine and an increase in other specialties, of the S H M O grade? I know that this grade has been violently opposed in the past, but then we looked forward to an expansion in the consultant services and presumed there would be an increasing number of openings for the top grade of registrar This suggestion, or that of "Senior Registrar" (Nov 18) that senior registrars should be retained for 6 years, would seem to me to have the merit of least disrupting the hospital services It would be disappointing to many but would not give the sense of despair that the present cut has produced

I am completely in favour of the G.P being more in the hospital "swim," but cannot see part time clinical assistants with conflicting calls on their time offering the service given by the present registrars

REGISTRAR

SIR,—We registrars, suggest immediate collective action of registrars for the amendment of the Ministry of Health edict, if only to avert our financial ruin, irrespective of the wider questions of increasing the number of consultant posts and maintaining adequate hospital staffs

We suggest two basic demands to achieve this (1) security of tenure of non teaching hospital appointments above that as senior houseman, such as existed in the municipal hospital services, and (2) constructive proposals for those leaving the hospital service, to replace the impracticable suggestions about the Armed Forces and the Colonies contained in paragraph 12 of the Ministry's circular

Such security of tenure will mean

(*a*) That non teaching hospitals will not be robbed of a vital segment of their medical staffs, a cut is bound to be at their expense as it appears unlikely that registrar appointments in teaching hospitals will be cut by half

(*b*) That individuals not advancing to consultant status will drop out (as, indeed they always did) at their own convenience, and consultants will be produced by competition, experience, and qualifications instead of by any rigid and uniform time table system Recurring artificial crises of superfluous registrars would not then arise At present the situation can be compared to a factory where the foremen not reaching the board of directors in two years, are automatically thrown out of the industry

The constructive proposals for those leaving the hospital service might include facilitated entry into general practice, training courses without loss of pay—essential for those who have spent years in a specialty—preference for practices where part time work in the specialty would be available, and no sudden termination of contracts now

We urge the most vigorous action of all registrars by personal interviews with M P s, through their own groups of the B.M.A, and, if possible, by a deputation to the Minister of Health

H BOURNE
P W GRANT
N C CONNELL
I MURRAY DALE
J A HALLINAN
J F HUDSON
J A IRWIN
J B JEFFRIES
N B JETMALANI
Registrars

Netherne Hospital Coulsdon Surrey

FIELD WORK FOR STUDENTS

SIR,—In your leading article last week, you mention some of the measures taken to bring medical students into contact with general practice Students from Guy's Hospital have been visiting the homes of patients attending the general practice of the Bermondsey Medical Mission as part of their course in social medicine. The staff of the mission have found that students and patients alike enjoy these visits. My own experience in taking part in this experiment has convinced me that much benefit could result to both parties by an extension of this method

TREVOR H HOWELL
Consulting Physician
Bermondsey Mission Hospital

London S E 1

Letters to the Editor

REGISTRARS

SIR,—Both the action of the Minister and the reaction which it has evoked appear to me to show a singular lack of realism and a lamentable failure to grasp fundamentals The attempt is being made to staff the hospitals by adapting a system outmoded by the nationalisation and the phenomenal advance of medicine Such an attempt is doomed to failure You cannot put new wine into old bottles Moreover, there is no surer way of getting into a muddle than by calling persons and things by their wrong names "Consultant" originally meant one who gives a second opinion Later it became a courtesy title for those who had retired from active hospital staffs Now it is applied to nearly all who hold part time or full time permanent hospital appointments Anæsthetists, for instance, have become "consultant anæsthetists," a term which does not make sense The modern registrar performs few, if any, registrary functions, these having been assumed by the records officer, he is in reality a physician, surgeon, or specialist

Before the war those who undertook the long and arduous climb to consultant rank did so with their eyes open A great many gave it up at various stages, slipping quietly and with a good grace into general practice where their experience usually enabled them to build up a specialist practice on a less ambitious scale than they had originally hoped The supply of aspirants was thus automatically adjusted, if not to national needs, at least to the amount of money which the community was prepared to pay In other words, the number, and therefore the standard, was limited by the amount which could be earned in private practice Although this factor has ceased to operate, the recollection of it persists, and inhibits clear thinking Despite the budding off of new specialties such as pædiatrics and thoracic surgery, the amount of general medical and surgical hospital work has enormously increased Yet the number of general physicians and surgeons has not been increased, the burden of the extra work devolving upon the registrars

In contrast to the registrars the consultants find themselves in clover Formerly, as everyone knows, the young consultant faced a hard struggle for many years, eking out a livelihood by odd teaching jobs and depriving himself of holidays for fear of missing a patient Now, from the word "go" he is completely relieved of financial anxiety He has a permanent appointment at a substantial salary and unaffected by competition, six weeks' holiday with pay, sick leave and study leave on generous terms, and a pension at the end of it He enjoys, too, the exceptional privilege of deciding for himself how much time he gives to the service

Such wide disparity in pay and security is justified only if the consultants confine themselves to the difficult work, leaving the easier to the registrars But this is just what does not happen Registrars, though responsible to their chiefs and relying upon them for guidance in difficulty, carry out much of their work independently In the absence of their chiefs on holiday they are in sole charge, at night and at weekends they perform operations which are quite as difficult as those performed by their chiefs during normal hours

It is widely believed, both inside and outside the profession, that the whole of consultant work (using this term in its modern sense) requires unusual ability and an experience acquired only after many years of apprenticeship, and we are told that the requisite standard cannot be maintained unless there is always a large field from which to select It is about time this bubble was pricked Great experience and judgment certainly are required, but, under modern hospital conditions, only in a minority of cases With all due respect I cannot see that these qualities are required in order to refer a patient for X ray examination at the request of his doctor, a second to the dietitian for weight reduction, or a third to the physiotherapist for the treatment of so called fibrositis of the neck Still less can I see that they are required for the strange new practice of writing to the doctor a lengthy and quite gratuitous account of the patient's symptoms—facts with which the doctor is perfectly familiar and which form the reason for his sending the patient Yet this kind of work looms large in outpatient departments and is performed by consultants and registrars indiscriminately (incidentally keeping thousands of typists happily employed) Can it be seriously maintained that it calls for exceptional gifts or involves heavy responsibility?

Since the wholesale reference of patients to hospital is deemed necessary to a science worshipping society, somebody has to do the work. The consultants could not cope with it even if they gave up private practice, which few of them would be prepared to do They have come to rely on the registrars for the performance of work which is nominally theirs Moreover it is owing to the provision of registrars that they have been enabled to continue private practice They therefore cannot stand by and watch those who have served them so well thrown to the wolves They cannot profit from an outrageous system whereby the State entices people into its service and keeps them on probation until the age of about 35 (half man's allotted span) Moreover, the State may well be compelled by circumstances to decree that private consultant practice is incompatible with employment in the service

The solution therefore is perfectly clear Permanent establishments should be increased until they are sufficient, and there should be a much closer approximation of pay, even if this means, as it inevitably must, a reduction in the salaries of existing consultants In view of the heavy incidence of surtax, those who enjoy distinction awards will at least be consoled by the knowledge that they are handing their money over to their fellows instead of to the Chancellor of the Exchequer Meaningless designations and obsolete concepts of status and dignity must be abandoned and, within the limits set by the national finances, work must be rewarded on the only rational basis—namely, the intellect and craftsmanship needed for its performance

Cambridge FFRANGCON ROBERTS

SIR,—I have been instructed to report the resolutions of the Welsh Regional Registrars' Group at a meeting held in Cardiff on Nov 25 The resolutions were passed unanimously by the 32 members present, amongst whom were representatives of most parts of the region

While the Ministry's circular [1] was condemned as being a totally unsatisfactory solution of the registrar problem, certain features were singled out as being particularly unacceptable

The instruction in paragraph 9 (ii) that registrar and senior registrar appointments be reviewed annually and where necessary terminated on the implementation of the reduced establishments, was regarded as representing flagrant breach of contract where appointment has already been made for 2 or 3 years in accordance with the terms and conditions of service

The recommendations in paragraph 11 (b) that general practitioners "with registrar experience be appointed as part-time clinical assistants were unanimously condemned as completely unacceptable

The appointment of ex registrars as part time clinical assistants while engaging in general practice near their hospital work would be as unacceptable to the previously established general practitioners in the area as to the displaced registrars It would lead to further attenuation of

1 See *Lancet* Nov 11 1950 p 537

sugar level remained low, showing that the tuberculous meningitis was still in an active stage [6]

It was more difficult to interpret the cases—seen mainly before sufficient experience was gained with streptomycin therapy—where the cell and protein content were more or less increased and the sugar content was normal but potassium permanganate reduction was produced within five minutes [7] In my opinion, these cases are in the active stage Here increased sugar content does not indicate healing, and it may be brought about in several ways, such as by the encephalitis, extensive tuberculomata in the brain, tuberculous abscesses, œdema cerebri, disturbance of regulation by the diencephalon, or disturbance of reabsorption of C S F The strength of these enhancing factors outweighs the lowering influence of meningitis [8]

There are two other interesting groups In one tuberculous leptomeningitis is cured and the C S F is normal, but cerebral tuberculosis is in an active stage Aveyn and Ivanovszkaja [9] have found this condition in 6% of cases examined post mortem Tubercle bacilli could easily break into the C S F from the cerebral foci On the other hand, the patient can be cured clinically, as well as by the criteria of C S F cell, protein, and sugar content, and yet tubercle bacilli can be detected in the fluid In Levinson's [10] opinion, in such cases no further streptomycin treatment is necessary

Volcsok et al [11] suggest that when tubercle bacilli are found in the C S F of patients who have been treated with streptomycin for tuberculous meningitis, this treatment should be immediately recommenced even if the C S F is entirely normal

Brody Children s Hospital, Budapest BELA STEINER

POTENTIATION OF SULPHONAMIDES

SIR,—I have read with interest the article by Professor Bigger and Mr Ware, and also the annotation, in your issue of Sept 30, and I agree completely with your remarks It would be a pity if the widespread practical application of a potentiated form of the first broad-spectrum chemotherapeutic to have been evolved were hampered either by the untimely retirement of Professor Bigger or by the undivided attention now being given to the fermentatively produced antibiotics

Goldberger,[12] who is attending surgeon to this hospital, was apparently able to convert the "bacteriofrenic activity" (to use Professor Bigger's term) of various sulphonamides to bacteriocidal effects, by the use of defined chemically pure substance the prototype of which was azochloramide Further investigation by Goldberger and his associates indicated that most oxidising agents, whether or not they yielded molecular oxygen (we should now term them "delectronators"), potentiate sulphonamide derivatives In the past four years this clinical laboratory discovery has been applied here in the management of wounds and wound infections, with what appear to me excellent results By others perhaps the significance of these findings may not have been fully recognised, owing to the present day reliance on fermentatively produced antibiotics (though in many respects these may be decidedly inferior for direct application to wounds)

From Dr Goldberger s original study it is possible to infer a degree of ubiquity for the thermostable potentiator described by Dr Bigger and Mr Ware This may prove to be a ferric porphyrin derived from cytochrome oxidases present in many biological materials, for though an enzymatic oxidase would be as vulnerable to heat as any protein the "hæm" prosthetic nucleus is relatively indestructible, and under appropriate conditions of pH and redox potential may be as effective an delectronator as the oxidising agents in the category first used for sulphonamide potentiation by Dr Goldberger

Terrace Heights Hospital Hollis New York N Y ROBERT D BARNARD Clinical Hæmatologist

6 Steiner B *Lancet* 1950 i 466
7 Ferencz P *Orv Hetil* 1928 72 73
8 Steiner B *Acta Oto-Laryng Stockh* 1949 37 381
9 Aveyn A P Ivanovszkaja T E *Nevropat Psikhiat* 1948 17 4
10 Levinson A *Amer J Dis Child* 1949 77 709
11 Volcsok Sz Makovszkaja C G Pevzner A E *Probl Tuberk* 1949 i 45
12 Goldberger H A *Amer J Surg* 1942 56 353

CHEST PHYSICIANS AND TUBERCULOSIS

SIR,—There is a widespread tendency amongst chest physicians either to ignore some of the basic facts of tuberculosis, or else to refuse to face them Perhaps it is because a modern chest physician is so occupied with therapy that he has little or no time for prophylaxis This is a most serious matter in pulmonary tuberculosis, where prevention is much more important than cure

The preventive efforts of chest physicians are limited today to a few large film or screening sessions, and periodic exhortations to general practitioners to forward cases that might have suspicious symptoms It is true that some chest physicians with fluoroscopes do sometimes find active disease, but as a preventive measure their methods are as hopeful as trying to empty the Serpentine with a pint pot Indeed one might say that the preventive measures of chest physicians are like a man pouring water into a bucket, not with a hole in the bottom, but with no bottom at all

The present tuberculosis service is a superstructure built on an insecure foundation—insecure because it is mainly ignorant of, and impotent to deal with, the large underground reservoir of infection Unless this reservoir is drained there is, despite declining mortality, no hope for any major advance in the control of tuberculosis in the next five years If this is doubted, appraisal of the facts might help For instance, in a London population of 300,000 people, served by a well organised chest clinic, at the present moment the number of undiagnosed active cases requiring treatment is more than twice the number of active cases seen by the chest physician in the whole year At present we allow the stream to flow from the reservoir, and in time to grow into a veritable river

It is high time that much greater attention was paid to the prophylaxis of pulmonary tuberculosis The present practice of relying on symptoms for case-finding is inadequate, and it is to well organised half yearly routine radiography, on 35 mm film, of all susceptible age groups that we must look for help The disadvantages of such a scheme are great, but not great enough to put it out of court The advantages are so evident that it is unnecessary to list them

No doubt I shall be severely taken to task for suggesting methods that would swamp the already insufficient tuberculosis beds, but, as Dr Toussaint has shown in Willesden, there is great scope for the domiciliary management of tuberculosis Much of the disease discovered by routine radiography could be treated by this means

Laennec wrote in 1819, seven years before his death from pulmonary tuberculosis: "Small tubercles separated from one another by portions of healthy lung cannot be recognised But at this period of their progress the health is commonly still good and the cough too slight to induce the patient to consult a medical man" Here Laennec clearly stated the whole problem of early diagnosis and the case for routine radiography Laennec had to rely on symptoms and the stethoscope for his case finding We do not We have radiography and the laboratory But whereas Laennec was able fully to exploit the stethoscope in his short life time, we have not yet so used routine radiography Today there are many chest physicians who make pleas for the early diagnosis

SALICYLATE AS AN ANTICOAGULANT

SIR,—I was interested to see that at a recent meeting of the British Cardiac Society Dr J L Lovibond, who had investigated the value of salicylate in the treatment of coronary thrombosis, reported that this drug is an unpleasant but safe anticoagulant for domiciliary use He found that few patients were able to tolerate sodium salicylate or calcium aspirin ('Disprin') in the massive daily dosage of 200 grains for many days This is not surprising, for sodium salicylate is notoriously more prone to induce toxic symptoms than aspirin and has the serious disadvantage of increasing the sodium content of the body, and calcium aspirin has nothing to recommend it in the treatment of thrombosis, as a substitute for aspirin, except its solubility

I am still using aspirin in suspension as a routine treatment for phlebitis, pulmonary embolism, and coronary thrombosis, in doses of 20 grains four hourly—i e, 160 grains daily When the instruction to give the mixture with milk or other food is strictly adhered to, the patient seldom complains of any discomfort referable to the drug There is a big difference between giving 20 grains of aspirin powder on an empty stomach and 20 grains in suspension with food, but it is surprising how many apparently intelligent people do not appreciate this It would be a great pity if a safe and simple remedy of proven value in the treatment of thrombotic diseases were to be discarded for the lack of a little common sense

Torquay PAUL GIBSON

MYXŒDEMA FROM RESORCINOL OINTMENT APPLIED TO LEG ULCERS

SIR,—In their article of May 6, Dr Bull and Dr Fraser reported myxœdema in three elderly women who had for a long time received applications of resorcinol ointment for varicose ulcers In each case sections of the thyroid gland showed signs of hyperactivity characteristic of the action of an antithyroid drug In the same issue Dr Donnach and Dr Fraser confirmed the antithyroid activity of resorcinol in animals and found that thiouracil does not enhance this activity

We therefore thought it desirable to study the histological response of the thyroid in animals after administration of resorcinol

For this purpose seven rabbits (six bucks and one doe) were used, and five bucks served as controls All of them belonged to pure strains (Moravia Black, Silverblack, Chinchinella), were 5–8 months old, and weighed 1220–2300 g They were kept in the usual wire cages and were fed on hay, bread, and oats

Resorcinol was administered subcutaneously as a 1% solution in 0 9% saline solution, 50 mg per kg body weight was given for 4 days and 75 mg for 15 days The total amount of resorcinol administered was therefore 1325 mg per kg The absolute amount administered during the 3 weeks of the experiment varied from 1590 mg to 3096 mg according to the weight of the animal The drug was tolerated fairly well by the end of the experiment the animals had lost about 5% of their weight They were then killed by air embolism The thyroids of these animals showed no signs of enlargement (their weight averaged 95 mg), nor any change in their tender consistence or in their colour compared with those of the controls Likewise the histological picture did not differ from that in the control animals apart from changes that were within normal limits

To observe the effect of methyl thiouracil and resorcinol administered together, the former was given subcutaneously to seven rabbits in doses of 100 mg per kg body weight in N/10 solution of sodium hydroxide six times weekly for 9 weeks (total amount 9040–11,105 mg) From the 7th week four of the seven animals received resorcinol subcutaneously as in the previous experiment All seven rabbits were bucks, of pure strain, kept under the same conditions and killed in the same way as in the previous series The thyroids of all seven animals were greatly enlarged, their weight averaged 735 mg and they had a fleshy red colour and firmer consistence Histological examination revealed in each case the well known effect of methyl thiouracil, and this effect was in no way modified by the resorcinol

Thus the administration of resorcinol does not change the histological structure of the thyroid in rabbits, nor does it influence the effect of methyl thiouracil administered simultaneously

FR KLEIN
V OTTIS
J VELVART
Department of Pathology, Slovak University Bratislava Czechoslovakia

SIMPLE TEST FOR PREGNANCY

SIR,—For the past ten years I have been using a simple clinical test for pregnancy

It consists in injecting 5 mg progesterone on three alternate days The absence of withdrawal bleeding is a positive sign of pregnancy If the amenorrhœa is due to any other cause, bleeding occurs in about 5 days Cases of obstruction—congenital or acquired—and of absence of the uterus can be easily excluded by bimanual examination I have had no chance to use the test in cases of hydatidiform mole, but I expect that it would be positive

Suhag Upper Egypt M EL MISHAD

TUBERCLE BACILLI IN THE C S F

SIR,—In your annotation of Aug 19 you remark that "many factors concerned in the pathogenesis of tuberculous meningitis are still imperfectly understood"

We have learnt that tubercle bacilli may be found in the cerebrospinal fluid (C S F) without clinical or pathological evidence of meningitis We do not know why the presence of tubercle bacilli in the C S F is not always followed by tuberculous meningitis, or why in some cases the meningitis is only circumscribed Rich [1] suggested that very numerous bacilli are necessary to produce meningitis Schwarz [2] has often seen cases where caseous masses have broken down into the subarachnoid space without a violent reaction, even in the presence of numerous acid fast bacilli It seems that the number of tubercle bacilli is not the deciding factor in every case Koch [3] suggested that tubercle bacilli can multiply in the C S F It might be reasonable even to assume that phagocytosis may take place when the organism gets into the C S F, and the effectiveness of this could decide whether or not tuberculous meningitis will develop

During treatment of miliary tuberculosis with streptomycin tubercle bacilli may be found in the C S F while tuberculous meningitis is developing, without any clinical evidence For this reason diagnostic lumbar puncture should be performed periodically on patients with miliary tuberculosis In diagnosis C S F sugar estimation can help in distinguishing tuberculous meningitis from a tuberculoma in the meninges or the brain With each the protein level and the number of the cells is increased, but whereas in tuberculous meningitis the cells usually exceed 20 per c mm —usually they number 50–300 though they may exceed 1000—with tuberculoma the number remains under 20 per c mm In tuberculous meningitis the sugar content is low and continues to fall,[4] whereas in tuberculoma the sugar content is normal Tuberculoma may or may not produce meningitis, so it is perhaps best to avoid the diagnosis of "serous tuberculous meningitis," suggested by Lincoln,[5] because this might give the patient or parents a false sense of security

It is no surprise that we can detect tubercle bacilli in the C S F of patients with tuberculous meningitis who have received intrathecal streptomycin and have been regarded as clinically cured I have often found that when a child seemed to be "clinically cured," the cell and protein content of the C S F decreased while the

1 Rich A R McCordock H A Bull Johns Hopk Hosp 1933, 52 5
2 Schwarz J Amer Rev Tuberc 1948 57 63
3 Koch O Beitr Klin Tuberk 1940 94 183
4 Steiner B J Jb Kinderheilk. 1923 102 173
5 Lincoln J M Amer Rev Tuberc 1947 56 95

SIR,—We have followed with interest the controversy over the effect of deoxycortone and ascorbic acid in rheumatoid arthritis since the original communication of Lewin and Wassén Rheumatoid arthritis is a disease notorious for its exacerbations and remissions, so that any evaluation of the efficacy of a given therapeutic regimen in this disease is admittedly difficult The dramatic and definite clinical response to 'Cortisone' and A C T H in all or almost all cases of rheumatoid arthritis, however, cannot be questioned

It occurred to us that the comparison of the response of the same patient to Lewin and Wassén's regimen and to cortisone would be a more objective method of evaluating this method of therapy We have therefore given 4 patients with classical severe rheumatoid arthritis a two week course of cortisone Therapy was then discontinued for two weeks, after which they were given a two week course on the exact regimen outlined by Lewin and Wassén, with injections once daily All 4 patients had a rather dramatic response to cortisone, with alleviation of their arthritis After two weeks off therapy, 3 of the patients had relapsed while 1 remained in remission. The relapse continued and indeed increased in severity during the next two weeks in these 3 patients, despite daily injections of deoxycortone and ascorbic acid The fourth patient has remained in remission to the time of writing, six weeks later

In this study deoxycortone and ascorbic acid had no noticeable effect on the clinical manifestations of rheumatoid arthritis Our results are strikingly similar to those of Dr Dresner and his colleagues [1]

U S Marine Hospital
Baltimore,
Maryland U S.A.

LUTHER L TERRY
FRANK LONDON

SIR —Cranswick and Hall,[2] who treated 37 mental patients with deoxycortone and ascorbic acid, noted temporary benefit in 11 depressives with a history of less than one year, and in 4 of these the depression remitted Moreover, of 12 patients who benefited previously or subsequently from electroconvulsive therapy (E C T), 11 also showed a positive reaction with deoxycortone Bourne [3] reported complete failure to confirm these claims and found no favourable response in 9 patients, 8 of whom later did well with E C T

Although the claims made for this treatment in its original field of application—rheumatoid arthritis—had also been refuted,[4] we thought it desirable to run a preliminary therapeutic trial, in which 30 patients suffering from a depressive illness (excluding patients with schizophrenia or cerebral disease) were treated with deoxycortone and ascorbic acid

The group consisted of 12 male and 18 female voluntary patients mainly over the age of 40 (average age 56 3 years, with 8 patients over 70 and only 3 under 30) 11 patients were severely depressed in 10 the depression was only moderate and in 9 the affective disorder was mild though still justifying the use of E C T as a last resort

Most of the patients were treated in accordance with an agreed programme which provided for six intramuscular injections of deoxycortone acetate in oily solution followed immediately by intravenous injection of 1 g ascorbic acid, given every other day The technique was that of Lewin and Wassén [5] which had been employed by Cranswick and Hall, and the sequence of dosage was 2 5 mg, 2 5 mg, 5 0 mg 5 0 mg 2 5 mg 2 5 mg any dose followed by clinical improvement was to be repeated at lengthening intervals Supplementing clinical observation, numerical ratings of the mental state were recorded before, during and after the treatment on a modified version of the Worcester behaviour chart

In no case did we obtain convincing evidence of changes comparable with responses to E C T In 4 cases improvement followed the course of deoxycortone, however, 2 cases soon relapsed and failed to respond to further injections, but remitted satisfactorily with E C T Short spells of subjective well being and cheerful overactivity occurred in 8 patients two to three hours after an injection and lasted a few hours, but these results were not consistently repeated The most marked reaction occurred in a mildly depressed man, aged 53, who had never shown any manic components to his illness, but who after his fourth injection (5 mg) became elated and flirtatious, with a voracious appetite, for a few hours followed by more profound depression on the following day, later E C T produced only temporary benefit 22 patients were given E C T, generally one week after the deoxycortone course and in 18 the depressive symptoms responded satisfactorily Of the 30 who received deoxycortone between June and August of this year, 21 have so far been discharged

While occasional euphoric episodes following some injections of deoxycortone are of interest and may deserve further investigation, our results have convinced us that deoxycortone and ascorbic acid is unlikely to find a place in the treatment of depressive illness

Bethlem Royal Hospital and
Maudsley Hospital
London S E 5

D L DAVIES
A HARRIS
F POST

1 Dresner E. Pugh, L G C Wild J B *Lancet* 1950 i, 1149
2 Cranswick E H Hall, T C *Ibid* p 540
3 Bourne H *Ibid* p 925
4 Bywaters E. G L Dixon A S Wild J B *Ibid*, p 951
5 Lewin E Wassén E *Ibid* 1949 ii 993

SIR,—Among the diseases which may occur in his general adaptation syndrome Selye [1] includes several skin conditions, such as lupus erythematosus, scleroderma, and psoriasis, and in the few cases in which A C T H has been tried in the United States the response of these ailments seemed encouraging [2] Conflicting reports have followed the publication by Lewin and Wassén [3] of their successful results in rheumatoid arthritis treated with deoxycortone and ascorbic acid, but nevertheless it was decided to try this combination in cases of these skin diseases Some cases of alopecia areata have been included on the grounds that this disease also is the result of a failure in the normal response to stress

The patients were treated for 6–8 weeks by one of two routines (1) deoxycortone acetate 5 mg intramuscularly and ascorbic acid 1 g intravenously once a week, or (2) deoxycortone 5 mg and ascorbic acid 0 5 g injected by the same routes as in (1) twice a week There was no significant difference in the results of the two methods, and whichever routine was the more convenient was chosen for the individual case since all but one were treated as outpatients Erythrocyte sedimentation rates (E S R) were estimated at the start of treatment and at regular intervals subsequently

RESULTS

Lupus erythematosus —Of the 10 cases treated, 1 was slightly improved but subsequently relapsed, 2 became worse, and the remaining 7 were unchanged These results were confirmed by the E S.R readings where the E S R. was initially raised it remained raised with minor fluctuations, and where it was originally within normal limits it remained so

Psoriasis —Of the 8 cases 3 were given as controls, 5 ml of physiological saline solution intravenously twice a week for four weeks Of the 5 treated with deoxycortone acetate 2 were improved and will probably clear completely 2 showed no change, and 1 was worse Of the controls, 2 were improved and will probably clear completely In 1 case treated with deoxycortone, where there was associated rheumatoid arthritis, the psoriasis was greatly improved but the arthritis was unchanged, as judged by the clinical appearances, measurement of the wrist-joints, and the E S.R, this was the only case of psoriasis in which the E S R was raised

Scleroderma —3 cases were treated without benefit, though 1 showed initial subjective improvement.

Alopecia areata —Of 7 cases treated 2 long standing ones improved, and the remaining 5 showed no change All these cases have been observed for three months from the start of treatment The E S.R was normal in every case

1 Selye, H *Brit med J* 1950 i 1383
2 Hench P S *Ann rheum Dis* 1949 8, 97
3 Lewin E Wassén, E *Lancet* 1949 ii 993

of pulmonary tuberculosis and yet still rely mainly on symptoms Early diagnosis is pre eminently a radiographic problem

THOMAS PAXON
Medical director mass X ray units North West Metropolitan Regional Hospital Board assistant chest physician St Alban s Chest Clinic
London W 9

DEOXYCORTONE AND ASCORBIC ACID

SIR,—Lewin and Wassén[1] recently reported the treatment of rheumatoid arthritis with deoxycortone and ascorbic acid Thereafter, some early reports[2] were hopeful, but latterly the effect has been recorded as slight or nil[3]

At this hospital 20 cases of rheumatoid arthritis, affecting the peripheral joints, have received this treatment In several cases the arthritis was associated with other lesions in one recurrent inoperable carcinoma of the bladder, in another severe secondary amyloidosis with renal and hepatic involvement, in 3 mild essential hypertension, in 2 generalised scleroderma (in one of these luetic aortitis with hypertension was also present), and in another chronic asymptomatic lymphatic leukæmia

All patients received a daily intramuscular injection of 5 mg of deoxycortone ('Percorten' in oil), followed within five minutes by 1 g of ascorbic acid (aqueous solution) intravenously Before treatment was instituted, each patient was thoroughly examined and his history was carefully elicited Affected joints were radiographed and a complete blood count and erythrocyte sedimentation rate (Westergren method), plasma cholesterol and serum protein estimations were done before and after therapy Weight and blood pressure were measured daily, and the patient examined for œdema and pulmonary râles

EFFECT OF TREATMENT WITH DEOXYCORTONE AND ASCORBIC ACID IN 20 CASES OF RHEUMATOID ARTHRITIS

Case no	Sex	Age	Severity: Gross, with deformities	Severity: Gross, without deformities	Severity: Moderate	Duration (years)	X ray changes	E S R	Treatment (days)	Improvement
*1	M	40			+	1/12	Nil	V rapid	8	Mod
2	M	58	+			20	Marked	V rapid	8	Mod
3	F	61	+			6	Marked	V rapid	7	Min
*4	F	58			+	2	Min	Normal	7	Min
5	F	44	+			9	Marked	Sl rise	7	Nil
6	F	60	+			4	Marked	Rapid	7	Nil
7	F	58		+		3	None	V rapid	8	Nil
8	F	52		+		7	Mod	V rapid	8	Nil
*9	F	55			+	2 1/2	Min	Sl rise	7	Nil
*10	M	52			+	3	Min	Rapid	7	Nil
11	F	38	+			5	Marked	V rapid	7	Nil
*12	F	50		+		1 1/2	None	Rapid	4	Nil
13	F	30	+			5	Mod	Rapid	1	Mod
14	F	40	+			6	Mod	Rapid	1	Nil
*15	M	33			+	3	Min	Sl rise	1	Nil
16	F	34	+			9	Marked	V rapid	1	Nil
17	M	55		+		6	Marked	Rapid	2	Nil
18	F	60		+		3	Mod	Sl rise	3	Nil
19	M	54	+			19	Marked	Sl rise	2	Nil
* †20	M	65			+	1		V rapid	8	Nil

* Radiographic changes negligible or absent rheumatoid like arthritis
† Death from acute pulmonary œdema

Of 12 inpatients (cases 1–12 in the accompanying table), 4 reported some relief of symptoms, 3 reported slight relief equivalent to that which may be expected from rest in hospital, and 5 were unaffected Of 8 outpatients, 1 showed moderate improvement, the remainder were unaffected

In no case did the E S R fall, nor was any change in the chemical composition of the blood detected No patient reported the exhilarating effect recorded by Lewin and Wassén Observations of the blood pressure in 3 patients with hypertension on admission showed that the levels fell to normal under treatment, but in one patient the pressure rose, while in another the onset of fatal pulmonary œdema may have been precipitated by the treatment

CASE 20—This patient, a woman, aged 65, had arthritis, scleroderma, hypertension, and luetic aortitis She received, as an inpatient, 8 days of treatment, and on the 8th day suddenly developed acute pulmonary œdema followed rapidly by death The sudden acute heart-failure may have been precipitated by deoxycortone, which is a pressor agent

This treatment is not a cure for rheumatoid or rheumatoid like arthritis

Mount Sinai Hospital, New York City
SELVAN DAVISON

SIR,—We have administered these two substances to patients with the following disorders rheumatoid arthritis (10), osteo arthritis (3), ankylosing spondylitis (4), traumatic arthritis (2), acute sciatica (3), and acute (1) and subacute (1) rheumatic fever

In the majority of cases 5 mg deoxycortone acetate was injected intramuscularly, and within five minutes 1 g ascorbic acid intravenously In some cases both drugs were given intravenously, with apparently more rapid results In 3 cases both drugs were given together intramuscularly from the same syringe, with no response at all, all 3 cases responded, however, when one of the two other methods was used The results were as follows

Rheumatoid Arthritis—Of the 10 cases, 8 were in a phase of acute exacerbation, with fever, loss of weight, depression, and manifest vasomotor disturbances In this group of acute cases, within two to six hours the pain was distinctly relieved and the range of movements much increased Improvement was maintained on the average for twelve to twenty four hours, and was again produced by repeating the treatment With each repetition the duration of improvement increased, so that after the fourth day the injections were given only every two to three days After 10 treatments, 7 patients had continuing relief though some pain returned, the 8th relapsed after two days, but a second course of 10 injections has produced a remission which has persisted for two months

The other 2 cases were not benefited, but 1 responded to a second course after small doses of thyroid and œstrogenic hormone had been given for six weeks

Osteo arthritis—The response was uniformly unsatisfactory

Ankylosing Spondylitis—The response was extremely satisfactory In 1 of the 4 cases the patient's posture before treatment was similar to that in postencephalitic parkinsonism After four hours the range of movements had greatly improved and this improvement lasted twelve hours After the second injection the improvement continued for twenty four hours. On cessation of treatment the 4 cases reverted to their former condition

Traumatic Arthritis—In both cases pain and swelling were completely or almost completely dispelled, and the range of movement was increased some improvement persisted when treatment was stopped

Acute Sciatica—The response was on the whole satisfactory, and in some cases it was spectacular

Acute and Subacute Rheumatic Fever—No response was noted

Thus the method seems to be of value in rheumatoid arthritis, especially of the more acute type In spondylitis and traumatic arthritis it may provide symptomatic relief, and relief was also noted in 2 cases of acute sciatica

Cairo
HOSNY AYAD

1 Lewin E, Wassén E *Lancet* 1949 ii 993
2 Methler S R Gordon G S Rinehart J F Plumhof C Ellenhorn M J McBride A *Bull Univ Calif med Center* Jan 1950 Le Vay D Loxton G E *Lancet*, 1950 i 209 Landsberg M *Ibid* p 134 Robertson J A *Ibid* p 135 Nashat F *Ibid*, p 135 Fox W W *Ibid* p 135
3 Kersley G D Mandel, L Jeffrey M R *Ibid* p 703 Bywaters E G L Dixon A St J, Wild J B *Ibid* p 951

cases streptomycin should be tried at least in the severe toxic group, where it may prove a life saving measure

The dosage which usually seemed most suitable was 2 g for the acute and 3 g for the chronic cases, given over 6–10 days, three hourly before feeds dissolved in sterile water or glucose solution

The details of this work will be published in the *Egyptian Medical Journal*

M DIWANY
ZAHERA H ABDIN

Children s Department, Kasr-el Aini
Faculty of Medicine Cairo

TROPHIC AND TROPIC

SIR,—In reply to Professor Dible's letter last week, I would point out that the arguments seem in favour of "trophic" rather than "tropic" Common scientific words in botany are "geotropic' and "heliotropic," which indicate a turning to the earth or a turning to the sun The hormone from the anterior lobe of the pituitary does not turn to the thyroid gland, nor is it attracted by the thyroid gland, but it exerts a most important influence on the development of the thyroid gland In its absence the thyroid gland diminishes to a very small size, it undergoes "atrophy", it does not undergo "atropy" Surely it is clear that the words "thyro trophic" and "gonadotrophic" are correct

Department of Pharmacology
Oxford J HAROLD BURN

REVOLT AT KINGSTON

SIR,—The letter from Dr Stark Murray in your issue of Nov 25 will I am sure, not be accepted as a strictly factual survey of the position that has arisen at Kingston

1 It is only beginning to be appreciated what autonomy the regional hospital boards possess, and it has been widely known for some time that they do not publish their plans in advance in order that they may be considered and commented on by interested bodies generally Recommendations of the board s committees involving considerable and fundamental changes in the hospital arrangements of a particular area are accepted by the board as its policy, and it is only thereafter that the area concerned is informed Representations of any sort, at any level, made subsequently appear to be unavailing

2 Who is to decide on the best use of hospital beds in any particular district? This question, I submit is crucial in the whole problem of hospital accommodation Should a remote body the regional hospital board, or a local body, the hospital management committee, be the arbiter? In the present "set up' neither body seems to be really representative of the people The members of both are nominated with the hospital management committee responsible to the regional hospital board but the latter, according to the Minister, actually responsible to no higher authority Surely in this age of democracy a method of election by really interested parties from below upwards is not beyond the wit of man?

3 Dr Murray is quite wrong in saying that the general practitioners exercised a close control on the number of doctors using the Victoria True, the number was increased in 1948 owing to a considerable influx of younger men after the war Nevertheless no general practitioner who has applied for admission has ever been refused.

In 1938 the lay committee of the Victoria Hospital agreed that Dr Stark Murray should be appointed as pathologist for three years By 1941 the emergency pathological service of the Ministry of Health was in operation Dr Murray was in local charge of this service, which did the pathology of the Victoria The question of his appointment was not reopened, and in consequence he has not been a member of the "elected consulting staff' since that year

In his statement on the medical review of the region by the board, Dr Murray states he was a member of the review committee and that he also supplied evidence In addition he is a member of the regional board and its medical advisory committee Now, it is an established axiom of British jurisprudence that no one can at the same time be witness member of the jury and judge But, by his own statement this is what happened This action provides incontrovertible evidence for our demand for an impartial public inquiry —the recommendation of which we are prepared to accept in advance

4 The board has not offered the general practitioners 38 beds in exchange for the Victoria It has offered a "hospital" obsolete for fifteen years, with no facilities of any sort worth talking about, and which is capable of holding, at most, 24 beds for acute sick. Despite inquiry, no information whatever of what consulting staff may be available has been given The hospital service of the area has always been mainly based on specialists Why de grade the general practitioners from a position they have held since the founding of the hospital in 1898 to one of considerably lower status? It is through the present arrangement that the general practitioners are able to maintain a reasonably high standard in the domiciliary service they offer to the population generally If this present arrangement is destroyed—and if Dr Murray s advice is taken it will be destroyed—then the standard of general practice will inevitably fall the patient will be the loser, and the service will suffer Is it the policy of the regional hospital board to build up a hospital service at the expense of the general practitioner service? If this is so, I am sure it is not what Parliament intended

Dr Murray is quite wrong in saying that in this group there are no beds solely under general practitioners Apart from Kingston and Richmond, all the beds are solely under the general practitioners, with of course, specialist cover available This is one of the features we are anxious to preserve The addition of "special unit' accommodation does not in any way depend on the change of use of the Victoria

5 To say that the staff of the Victoria has never held a meeting to discuss the question—who on earth is going to believe such rubbish? Dr Murray has never been invited, because, as I have pointed out, he is not accepted as being a member of the staff

Further, Sir, you will find that when the petition which is at present being circulated is presented, a large proportion of people in the boroughs of Kingston and Malden will be shown as having expressed their opinion against the proposal

Indeed, wiser counsels must prevail We have never refused "to sit round a table with those who have the arduous task of running the hospitals' to discuss the matter in its entirety in fact we have never been asked to do so We would be delighted to have the opportunity to put the case for the retention of the general practitioner hospital as an essential feature of the National Health Service This type of inquiry is that demanded recently by the British Medical Association

New Malden Surrey T W MORGAN

CHEMICAL PROPERTIES OF P.A S

SIR —In the course of a study of *p* aminosalicylic acid (P A S), this substance was found to have certain chemical peculiarities which may be relevant to studies of its bacteriostatic effects

P A S is a very strong reducing substance Potassium permanganate solution and potassium ferricyanate in the Hagedorn Jensen system are reduced far more by it than by sodium salicylate But P A S has the following chemical qualities, which sodium salicylate does not possess

1 It binds a large amount of iodine from an iodine solution.

2 In the presence of sunshine it increases the separation of metallic silver from the complex silver aminohydroxide and if this latter is mildly warmed it selects a silver mirror from it It greatly enhances the separation by sunshine of silver from photosensitive silver phosphate This is important for the estimation of urinary phosphatase

The urine of patients treated with P A S reduces Nylander solution, but Fehling's solution it reduces not at all or only very slightly We find that the reducing substance is not a sugar We have, however, found glycuronic acid in the urine of patients treated with P A S

Z HORN
S BOGSCH

Koltói Anna Hospital Budapest

There were no dramatic results in any of the cases treated Lupus erythematosus and scleroderma do not seem to be materially benefited by this treatment Of the 5 treated cases of psoriasis 2 improved, but so did 2 of the 3 controls, so one cannot attribute the change to treatment The improvement in 2 out of 7 cases of alopecia areata in the absence of any controls can also hardly be credited to the deoxycortone All in all, we are inclined to attribute the improvement noted in 4 cases out of the series of 25 (excluding controls) to the psychological effect of the injections

We wish to thank Dr George Harvey for permission to publish these cases

J O'D ALEXANDER
THOMAS COCHRANE
Royal Infirmary, Glasgow

FLORENCE NIGHTINGALE

SIR,—I submit for consideration the theory that Florence Nightingale suffered from hyperthyroidism which later turned to deficiency and mild myxœdema Her outstanding intellectual powers were fortified by the demoniac energy that excess of thyroid secretion gave her, and which caused her to use ruthlessly all her friends and relations in pursuit of her objectives It explains the prostration, heart attacks, and so on which caused her friends to believe her to be dying, and, too, the calmness and placidity of her later years

There is no suggestion in the "Life"[1] of a goitre, on the other hand, she would not allow herself in her active years to be photographed, and so no record is available The photograph that is reproduced is one taken at the age of 70 and, though a profile, is very suggestive of myxœdema

Coventry W FRASER ANNAND

ST PAUL'S CRAY APPOINTMENTS

SIR,—It is quite evident that the four doctors whose letter appeared in your issue of Nov 25 (p 655) did not read my speech, as I have never, in the House of Commons or elsewhere, alleged "that the L C C had 'appointed'" them What I said was

"I found that Dr J D Paulett was granted, by the county council, a house compulsorily acquired from a private owner and that having got those premises, he applied to the Medical Practices Committee, saying he had been granted, not a house, but the doctor's house on the estate and, therefore, asked them to give him permission to practise

"At that time, there were other doctors who had submitted their names to the London County Council as wishing to practise on this estate, but only the name of Dr Paulett appears to have gone forward and, as there was only one applicant and a growing demand by a new population, the *Medical Practices Committee had no option but to appoint him* Subsequently, a second doctor, Dr L M Franklin, was appointed to Dr Paulett's practice He had been on the London County Council list for houses, but he subsequently acquired one privately in the area and withdrew his name from the county council list Later, a third doctor, Dr Tuckman, was appointed to practise he having applied to practise with Dr Paulett Finally a Dr Tepper was appointed He was allocated a London County Council house on the estate, and *he applied to the Committee that he might be permitted to practise*, having had premises and facilities given him by the L C C"

From this it will also be seen that I made it quite clear that only two were L C C tenants

It is, I understand, the policy for these new estates that the medical practitioner should live on, or in the immediate vicinity of, the estate The physical possession of premises is, therefore, valuable and indeed vital to appointment, and where council houses are available, the selection of a tenant for the doctor's house, before appointment by the Medical Practices Committee, must prejudice the chances of other doctors, equally qualified and anxious to practise, but not granted a tenancy

House of Commons PATRICIA HORNSBY SMITH

1 Smith, C W Florence Nightingale London 1950 See *Lancet* Dec 2 1950 p 691

ROYAL MEDICAL BENEVOLENT FUND

SIR,—As Christmas day is near at hand I should like to remind your readers of our Christmas gifts fund, in the hope that those who have not sent their contributions will now do so quickly We must not fail in bringing happiness and extra comforts to our beneficiaries Contributions should be sent to Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S W 15, marked "Christmas Gifts," and will be gratefully acknowledged

C LUTHER BATTESON
Honorary Treasurer
Royal Medical Benevolent Fund

ORAL STREPTOMYCIN IN GASTRO-ENTERITIS

SIR,—In view of the contradictory reports regarding the value of streptomycin by mouth in gastro enteritis of infancy and early childhood, and because of the vital importance of any successful therapy, especially for this country where about half the fatalities in the first year of life are due to this cause, this treatment has been carefully studied in our hospital

Altogether 60 infants were given streptomycin by mouth Of these, 30 were severe cases of acute toxic dyspepsia, and the other 30 were chronic cases of severe gastro enteritis which had for months resisted all treatment, dietetic and chemotherapeutic, and many of which had passed into a marasmic state sometimes complicated, for example, by nutritional œdema or bronchopneumonia Over 90% showed *Bact coli* on stool culture The results are summarised in tables I and II

In the acute series (table I) the 100% recovery rate, with only 6% relapses, suggests that streptomycin exerts a curative action Nevertheless, a good number of these acute cases respond to ordinary conservative measures, so that small differences in percentages are not decisive

The evidence in the chronic resistant cases (table II), however, is fairly conclusive All these cases had for months resisted all other measures, and over 90% were cured with administration of streptomycin by mouth Sometimes the response was dramatic For example, in one case chronic severe diarrhœa of six months' duration was cured in thirty six hours and did not relapse in the subsequent three months, and in another chronic vomiting which had persisted for one month was cured in two days We believe that the response in these chronic resistant cases puts the value of oral streptomycin therapy beyond doubt

We would advise the use of streptomycin by mouth in all cases of chronic resistant gastro enteritis, especially those revealing *B coli* on stool culture, as to the acute

TABLE I—ACUTE TOXIC CASES

Treatment	No of cases	Response		Deaths	Av increase in weight per week (g)	No of cases becoming chronic	Relapses
		Within 1 week	Over 1 week				
Streptomycin	30	24 (80%)	6 (20%)	0	300	0	2 (6 6%)
Controls (sulpha guanidine)	30	18 (60%)	6 (20%)	4 (13 3%)	50	2 (6 6%)	6 (20%)

TABLE II—CHRONIC CASES

Treatment	No of cases	Cases responding	Interval before response	Deaths	Relapses
Streptomycin	30	29 (97%)	1–21 days	1 (3 2%)	2 (6·6%)
Controls	30	0	—	—	—

Parliament

Voluntary Euthanasia

IN the House of Lords on Nov 28 Lord CHORLEY asked the Government at any rate to accept the principle of voluntary euthanasia so that legislation could be introduced in due course He suggested that euthanasia might be granted on the following conditions

The sufferer must be not less than 21 years of age, of sound mind and suffering from an incurable and fatal illness involving severe pain He must make application in writing on a form signed in the presence of two witnesses The application must be supported by two medical certificates one from the applicant s own doctor and the other from a doctor with special qualifications for dealing with these cases, the application must be made to a referee appointed by the Minister of Health, and the referee must personally see the sufferer to ensure that the conditions had been fulfilled and that the patient fully understood the nature and purpose of the application Euthanasia would be administered by a doctor from a special panel maintained for the purpose

The ARCHBISHOP OF YORK opposed the proposal not through lack of sympathy but for religious and social reasons He could not criticise the doctor who with a full sense of responsibility, alleviated pain, even if by so doing he shortened the life of a patient dying from an incurable disease But this, he felt, was entirely different from passing legislation on the subject It would be a serious matter if for the first time there appeared on the statute book a law which gave certain people licence to kill some of their fellow men and women Capital punishment was justified only because it was the vindication of the sacredness of human life If once legislation of this kind was allowed where were we to stop? Why should it not apply to the feeble minded, the physically crippled, and those in mental asylums?

Lord HORDER hoped that the decision would not lie with the doctor Putting an end to human life involved a new principle in biological control, so foreign to the general sense of the community that he would be very surprised if it were accepted in Lord Chorley s lifetime, or ever A good doctor, in Lord Dawson's words, distinguished between prolonging life and prolonging the act of dying Any sanction which would reverse the doctor's function—to cure the patient s disease or prolong his life so far as might be—would not be in the public interest

Turning to the criteria laid down by euthanasia advocates Lord Horder pointed out that the disease which was incurable today might be cured next year Again the threshold of pain varied enormously in different patients and only the experienced doctor could judge how much pain was being suffered There had never been so many means of alleviating pain as today Illness, and even pain, for many people constituted a new experience, unhappy, but possessing spiritual significance and value To call the function of a doctor who helped a patient to achieve that degree of elevation of spirit an intolerable burden seemed to Lord Horder to be disparaging one of the very important duties that a doctor had to perform The two extremes of dying in pain and being killed did not exhaust the possibilities of the stricken patient There was a middle position achieved again and again by a kindly and skilful doctor who gave assistance to a fellow human being who had become an intimate friend. A further criterion was that the patient must be of sound mind, but there was no less difficulty in judging the patient's state of mind than in assessing the amount of his pain and the incurability of his disease The mind of the patient suffering from a lethal illness was not unsound in a legal sense, but it was uncertain and fitful, variable, and with little certainty or clearness of purpose. If euthanasia were introduced Lord Horder feared that old people might avail themselves of it, or think they ought to do so, because they felt they were encumbering the ground and would like to make room for someone else

Lord AMULREE pointed out the change that a law of this sort would make in the atmosphere of the sick-room At present the patient was convinced that the doctors and nurses were doing their best to alleviate his pain If a patient felt that one day the doctor would come in as executioner, even though the patient might long to end his life himself because of pain, Lord Amulree did not think that it would lead to an improvement in the relations between doctor and patient Lord UVEDALE held that there were few cases at present where euthanasia should be contemplated, and these cases would become fewer still as new remedies were introduced The matter should be approached with great caution remembering with all humility that euthanasia was an admission of failure and a counsel of despair

Lord HADEN-GUEST reported that at the meeting of the World Medical Association in Scandinavia this spring a resolution was passed against euthanasia The association represented doctors from every country in the world which chose to send delegates, and he thought it might be said that the vast majority of medical opinion in the whole world was against euthanasia The vast majority of doctors in this country felt that whoever else was going to administer euthanasia, it was not they The suggestion that the business of euthanasia should be put in their hands, that they should meet round the bedside of a patient and give him some injection to cause death, was to them a dishonourable suggestion

Lord WEBB JOHNSON also thought the idea of euthanasia was dreadful when one had spent a lifetime in taking risks to save human life He cited instances of several incurable diseases which had lately become curable Were they to contemplate the situation in the sick-room where an elderly patient with a chronic illness looked round with suspicion and accepted every suggestion such as "How can you bear all this?" or 'Don't you wish it was over?" as a suggestion that he should apply for the appropriate form and fill it in? Moreover, suppose, quite clearly on his own initiative, the patient put forward a request for release, was not to agree to that request legalising suicide? Lord Webb Johnson thought it was

Lord JOWITT, the Lord Chancellor, said that from the legal point of view the consequences of passing a Bill of this kind would be grave and serious The doctrine of what was called putting people out of their misery for the reasons which had been advanced might have serious repercussions on the criminal law of the land The introduction of a Bill, no matter what the safeguards might be, wou'd be wrong, because there could be no adequate safeguards when they allowed one human being to start killing another Once they departed from the doctrine of the sanctity of human life they would indeed be on the slippery slope

QUESTION TIME

Registrar Appointments

Mr J K VAUGHAN MORGAN asked the Minister of Health whether he would withdraw his proposals for an immediate cut in hospital registrar establishments with a view to putting forward an alternative scheme which would cause less hardship to those concerned, particularly those trainees whose careers had already been seriously affected by their war service —Mr A BEVAN replied This circular which has been grossly misrepresented was issued after full consultation with the profession s representatives Its object is in the interests of the profession itself—to secure a proper relationship between the numbers of training posts for future specialists and the number of specialist posts likely to be available In estimating the latter it allows for a reasonable annual expansion over and above mere replacements in present posts, and the numbers of training posts will be reviewed as and when further expansion occurs in later years The urgency of the circular is that the number of trainees has already risen to nearly twice the number needed to produce the specialists likely to be required and about four times the pre war number a situation thoroughly unfair to all concerned. The circular was not prompted by economy—indeed it provides for alternative appointments if necessary for the work of the hospital

Mr VAUGHAN MORGAN What prospects of suitable employment are open to those 1100 hospital registrars who would become redundant as the result of the proposed cut in establishment over and above the 700 appointments which are vacant in the Services and Colonial Medical Services —Mr BEVAN Each existing senior registrar and registrar will complete his present year of appointment Afterwards

PETHIDINE AND THIOPENTONE

SIR,—The use of pethidine hydrochloride as an adjunct to nitrous oxide anæsthesia is becoming increasingly popular, and I should like to draw the attention of potential users of this technique to the incompatibility of pethidine hydrochloride solutions with those of thiopentone sodium

Presumably owing to the marked difference in pH between the two solutions, a precipitate forms upon mixing If it is desired to follow the injection of thiopentone sodium with pethidine hydrochloride, untoward effects can be obviated by washing the apparatus, including the Gordh needle if used, with normal saline solution, before injecting pethidine hydrochloride

Queen Victoria Hospital
East Grinstead Sussex

F H SUMMERS
Pharmacist

CONSCIOUSNESS WITH VENTRICULAR FIBRILLATION

SIR,—We should be very grateful if any of your readers would give us information about the duration of consciousness after the onset of ventricular fibrillation This point arises in connection with the killing of dogs and cats by electricity In this procedure the current is passed from the neck to the hind quarters, not through the brain, and death is believed to be due to ventricular fibrillation Observations on the duration of consciousness after ventricular arrest in Stokes Adams attacks would also be of great interest Any communication reaching us will be most gratefully acknowledged

F JEAN VINTER
Technical Secretary
Universities Federation for Animal Welfare
284 Regent s Park Road London N 3

ENURESIS AND HYPERSOMNIA

SIR,—In your issue of July 22, Dr Strøm Olsen points out that in adults enuresis may be associated with deep sleep

For a number of years I have been aware of this, and accordingly I have been treating my enuretics with compounds of the ephedrine or amphetamine type, with gratifying results I started using this kind of treatment after reading the chapter on sleep by Dr Regelsberger in the German *Encyclopædia of Modern Medicine* (Spanish translation, 1935) He had found that in enuretics the curve of alveolar carbon dioxide reaches its peak (which is abnormally high) at the time of involuntary micturition In the same book Nassau mentions the relation of nocturnal enuresis with abnormally deep sleep

Madrid

EMILIO DE LA PEÑA

SCORPION STINGS

SIR,—Aly, Abul-Fadl, and Roushdy [1] have reported on the use of various substances against scorpion venom In common with these workers, we were prompted by the letter of McSorley and Perry [2] to ascertain the effect of emetine on animals envenomated with scorpion venom At the same time various other substances with alleged antidotal action were tested Some of the results, which support the findings of Aly et al, were mentioned in the annual report of this institute for the year 1949

The venom used was obtained from South African members of the genus parabuthus, the experimental animals were guineapigs and mice, the substances tested were emetine, atropine, adrenaline, procaine, ergotamine, dihydroergotamine, calcium gluconate, di mercaprol (BAL) anti histamine ('Histostab,' Boots) Combinations of atropine with either dihydroergotamine or anti histamine were also tried The survival rate and survival time of the treated animals and the controls did not differ significantly Atropine suppressed both the secretion from the respiratory passage and the salivation, and procaine abolished the severe pain, otherwise the symptoms of envenomation were not altered

Ahuja and Brooks [3] have shown, and Christensen and de Waal [4] confirmed, that local infiltration with a carbolic soap solution offers some protection against cobra venom We have since found that guineapigs which have received an LD_{50} of parabuthus venom in the muscle of a hind leg and which subsequently are treated by infiltration of the site with a 5% solution of carbolic soap in water stand a significantly better chance of survival than untreated controls

We should like to add that all the substances mentioned, with the exception of soap, were also tested against spider (*Lactrodectus indistinctus*) venom in mice and were found to be useless That calcium gluconate failed is of interest as it apparently has beneficial effect in treating spider bite in man

P AGERHOLM CHRISTENSEN
MARGARET WIDDICOMBE
South African Institute for Medical Research
Johannesburg

1 Aly M Abul Fadl, M. A M Roushdy, M *Lancet* 1950 1 1135
2 McSorley J G A Perry L M *Ibid* 1949 1 889
3 Ahuja M. I, Brooks, A G *Indian med Gaz* 1945 80 461
4 Christensen P A de Waal M *S Afr med J* 1947 21 680

STUDY OF DELINQUENCY

SIR,—May I add my voice to Dr Bodman's in criticism of Dr Stott's curiously biased Study of Delinquency in your issue of Nov 25 Dr Stott writes with a very large bee in his bonnet, but with Dr Bodman I will be charitable and suggest that his experience appears to be "strangely limited" Such tendentious statements as "Neither the public nor the State have yet begun seriously to deal with the child in his pre-delinquent phases Public concern is limited to punishing him when he dares to force his unhappiness [sic] upon us," and "Quite unnecessarily we allow unhappy children to remain unhappy" may be good propaganda, but they are a bad basis for a scientific study

Dr Bodman last week took up the more obvious prejudices in the article These I will not repeat, but I would note some other omissions My experience at a child guidance clinic over the past ten years is that the good teacher needs no special training to spot "the unhappy child and potential delinquent" He (or more often she) is only too pleased to use the local facilities One would think that Dr Stott had never heard of the now 20 year old child guidance movement, and knew nothing of the technique of examination and treatment at a child guidance clinic Not that facilities are all they might be, but I am afraid Dr Stott's approach will not endear him to our administrators and make it any easier to extend them

Dr Stott seems to have been very unlucky in his strange clinical contacts His cases make quaint reading But anyone can give odd examples of this kind, and I rather suspect him to be putting up aunt-sallies to knock them down I will not comment on his psychological views except to note that amongst a great deal of shrewd observation there is much vague theorising and angry prejudice

In conclusion I would quote Dr Stott's own remarks against himself "But before we can press these points we must convince the public that the psychologist can deliver the goods" Let Dr Stott try his hand for a number of years at treating his delinquents in the social environment in which they are to live subsequently He may find the experience not a little chastening, and discover that to make wild comments as a result of a research on some approved school types is much easier than to deliver the therapeutic goods to the public

Leeds

H EDELSTON

Like many great men he was simple in his tastes and modest to the point of self-effacement. However, this did not prevent his great gifts and kindly wisdom being sought in the service of many bodies, both lay and professional He represented Queen's University on the General Medical Council He was elected president of the Northern Ireland branch of the British Medical Association in 1932 and of the Irish Medical Schools and Graduates' Association in 1936 In the following year he was elected president of the Ulster Medical Society In 1948 he became a Deputy Lieutenant for the city of Belfast

As a member of the Northern Ireland Hospitals Authority, Thomson worked without sparing himself to extend and improve the hospital and specialist services to which he had already contributed much of lasting value, and his fellow members have sent us the following tribute "At all times Sir William's courtly manner his innate kindness, and his invariable charm and good humour earned our love and confidence In counsel he was wise and resourceful in discussion calm, courteous, and considerate, in difficulty helpful and courageous, and at all times unselfish, gracious and sincere His integrity was a beacon to light the way to truth and his example was a great encouragement to all who lacked his long experience and wide knowledge"

In the last years of his life came his two final honours—a knighthood and election to the presidency of the Association of Physicians of Great Britain and Ireland, which set the seal on his professional career "As Thomson never paraded his achievements," writes R S A., "many of the generations of students that he taught were only vaguely aware of the detailed brilliance of this great physician and scholar To all of them however, will remain the vivid memory of a kind friend and wise counsellor who was never too busy to spare the time to greet, and if need be, help with his wise advice any who came to him for it In the examination and treatment of patients this human outlook was able to balance his professional genius with the real insight into human nature without which medicine, at any time, loses more than half its value'

Thomson lived opposite the university campus, and he and his wife, formerly Miss Josephine Barron, kept open house for all. "Lady Thomson' writes a friend, helped in his career more than most people knew When he was incapacitated for three years by ulcerative colitis all the medical pundits said he would neither practise nor teach again, but Lady Thomson defied them, and he did" Their only child, Captain Humphrey Thomson, R.A.M.C, was killed during the Burma campaign, when he insisted on remaining with patients who were too ill to be moved when his hospital was evacuated

J H B writes "Brilliant as his achievements have been as counsellor, administrator, physician, and teacher, it was as a man that Thomson appealed to all of us He possessed a genuine charm, he was so essentially human, he treated his colleagues with an old-world courtesy and he showed that curious blend of learning and culture which is oft-times developed in the good physician The type of physician changes somewhat with the passing of generations, and many of us have felt that W W D was one of the last of the Osleran school Like Osler, too he was successful in the cultivation of such a measure of equanimity as enabled him to bear success with humility, the affection of his friends without pride, and to be ready when the day of sorrow and grief came—and as with Osler it came in the loss of an only son on the field of battle—to meet it with courage All of us feel that he had found the answer to the prayer of Socrates for beauty in the inward soul and for unity of the outer and the inner man.

"His charity will be missed in the wards, his knowledge in the Faculty, his wisdom in the Senate, and his humanity by all"

ALEXANDER LOW

M.A, M.D, LL.D ABERD

Dr Alexander Low, emeritus regius professor of anatomy in the University of Aberdeen, died on Nov 15 at the age of 82

He was born at Oldmachar in Aberdeenshire, where his father was a farmer From Aberdeen Grammar School he entered Aberdeen University in 1886, and after taking his M.A in 1891 he went on to take his medical degree, qualifying in 1894 He continued his studies at the universities of Freiburg, Vienna, and Zürich before joining the staff of the anatomy department at Aberdeen as assistant, later holding the posts of lecturer and reader In 1912 he took his M.D degree with highest honours In 1925 he was appointed to the chair, and the university later conferred on him the honorary degree of LL D

G A G M. writes "Alexander Low's outstanding characteristics were gentleness and a modesty amounting almost to diffidence It may be that his own congenital limb defect made him more sensitive to the failings, both physical and mental, of others, and that he was in consequence gentle and considerate to an unusual degree However this may be, Low attracted to himself a depth of affection that was remarkable He was a perfect example of the man who prefers to do good by stealth and who is embarrassed by its discovery, and not a few poor students during the past fifty years have benefited from his unostentatious help

"All his long and active professional life was spent in the service of Aberdeen University, but he was so retiring and modest in all he said and did that it is perhaps not surprising that his true academic merits were sometimes better appreciated beyond the confines of his own school In his earlier and formative years he spent several long vacations studying and investigating anatomy in Continental laboratories, and he had an enviable knowledge of German language and literature which he placed freely at the service of his more ignorant colleagues His life work was coloured by his contacts with the embryological and anthropological giants of these days and his chief interests always lay in embryology and anthropology, a fact reflected in his publications

"His researches were careful and polished, and anything he did such as his work on the development of the mandible and the arrangement of fibres in the diaphragm has survived almost intact the investigations of later workers An acknowledged authority on remains of the Neolithic and Bronze Age periods, he had also been engaged for years in extensive anthropometric and other investigations of growing infants and of problems connected with twinning After his retirement, he continued this work, often under great difficulties, especially during the war years Most of his results are unpublished, but as similar figures concerning the growth of infants during the first 5–6 years of life probably do not exist, it is to be hoped that somehow they will not be lost

"The twilight of Low's long life was burdened by increasing and trying infirmities, and the many who respected him so deeply are relieved to know that his fine and generous spirit is free at last"

WE have to record the death of a former member of our staff, Mr E M RYDER, who served THE LANCET for 42 years from 1892 to 1934 Besides acting as personal secretary to Sir Squire Sprigge, he was long responsible for the collection of material for the Students Guide, and for preparing New Inventions and New Preparations for the press He had a talent for neat yet lucid description, as well as decided opinions on things and people, and if his manner sometimes intimidated his junior (and even senior) colleagues, it did not quite conceal his real affection for his chief and his care for the traditions of the journal. In leisure hours he was an interesting companion, whose mind remained alert to the end of his life He died at his home at Wimbledon on Dec 1, aged 83, and is survived by his daughter

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Appointments

CRICK R P F.R.C.S D O M.S asst ophthalmic surgeon Royal Eye Hospital London

FIELDING WILLIAM M D Manc D P H deputy M O H. Sheffield.

KERSLAKE D M M B Lond. human physiologist Royal Air Force Institute of Aviation Medicine South Farnborough Hants

MARTIN K. W M.B Lond F.R.C.S senior registrar St. Peter's and St Paul's Hospitals London

NEWMAN N M.B. D.P H asst. M.O H Hove Sussex.

TINKER CECILY M.D Lond M.R.C.P senior registrar Lancaster House Chest Clinic Southend-on Sea Essex.

a senior registrar whose appointment is not renewed but whose services are still needed may be offered a similar temporary hospital appointment for one year Others and registrars can—as has always been the case where appointments in these training grades have not been renewed—apply to set up in general practice, possibly supplemented by a part time clinical assistantship at a hospital, or for appointments in civilian medical practice in this country as well as in the fields referred to by the hon Member, or for university and hospital appointments abroad

Replying to Mr. Henry Brooke, Mr Bevan said that the number of posts of registrar and senior registrar which would be abolished in hospitals in the North West Metropolitan region if his recent circular was fully implemented was about 240 and 290 respectively (including the figures for the teaching hospitals in the area)

Beds in Tuberculosis Sanatoria

Mr SOMERVILLE HASTINGS asked the Minister what was the number of beds reserved for the treatment of pulmonary tuberculosis in sanatoria, general hospitals, and fever hospitals, respectively, which were now empty because of shortage of nursing and domestic staff, what was the number of beds at present reserved for the treatment of pulmonary tuberculosis in sanatoria, general hospitals, and fever hospitals, respectively —Mr BEVAN replied The number of tuberculosis beds provided in institutions classed as sanatoria and tuberculosis hospitals is about 27 700, of which about 4400 are unstaffed There are some 3500 staffed tuberculosis beds in other hospitals Of the 31,200 staffed beds approximately 27,200 are for pulmonary and 4000 for non pulmonary tuberculosis

Service Pay

In answer to a question, Mr EMANUEL SHINWELL stated that increases in pay had been approved for medical and dental officers of the three Services In addition there will be increases in specialist pay for medical and dental specialists in the Royal Navy and Army, in the Royal Air Force specialist qualifications will continue to be recognised by a system of accelerated promotion The increased rates will not apply to National Service officers until they have completed 18 months' whole time service The increases and new rates, which will take effect from Sept 1, 1950, are as follows

BASIC PAY

Rank (only Army ranks shown)	Increases		New rates			
			Medical officers		Dental officers	
	Daily	Annual	Daily	Annual	Daily	Annual
	s d	£	s d	£	s d	£
Lieutenant	4 6	82	26 6	484	24 6	447
Captain			32 6	593	29 6	538
After 2 years			35 6	648	32 6	593
3 "	7 0	128	38 0	694	35 0	639
4			41 0	748	38 0	694
6 "			44 0	803	41 0	748
Major	7 0	128	50 0	913	47 0	858
After 2 years			53 0	967	50 0	913
4			56 0	1022	53 0	967
6			59 0	1077	56 0	1022
Lieut Colonel	8 0	146	66 0	1205	63 0	1150
After 2 years			69 0	1259	66 0	1205
4 "			72 0	1314	69 0	1259
6			75 0	1369	72 0	1314
8			78 0	1424	75 0	1369
Colonel	10 0	183	85 0	1551	82 0	1497
After 2 years			88 0	1606	85 0	1551
4			91 0	1661	88 0	1606
6			94 0	1716	91 0	1661
Brigadier	10 0	183	97 0	1770	94 0	1716
Major General			120 0	2190	120 0	2190
Lieut General	15 0	274	150 0	2738		

SPECIALIST PAY

—	Royal Navy		Army	
	Increase	New daily rates	Increase	New daily rates
Graded specialist		5/-		4/-
Full specialist	3/- a day	8/-	4/- a day	8/-

National Service Medical Exemptions

In answer, to a question Mr G A ISAACS, Minister of Labour, said the numbers of men exempted from national service on medical grounds from 1946 to 1949 and those exempted this year were as follows

Year	Number exempted from National Service on medical grounds *
1946	39 061
1947	24 648
1948	24 711
1949	33 818
1950 (to Sept 28)	34 506

* Excluding men not examined—e g the blind and limbless

Obituary

WILLIAM WILLIS DALZIEL THOMSON

KT, B A R U I, M D, B SC Belf, F R C P

Sir William Thomson, professor of medicine in Queen's University, Belfast, and its representative on the General Medical Council, died on Nov 26, at the age of 65

A son of the late Dr W Thomson, J P, of Anahilt House, Hillsborough, co Down, he was educated at Campbell College, Belfast, and later at the Queen's University The whole of his academic career was a succession of brilliant achievements In 1906 he won the Henry Hutchinson Stewart scholarship of the Royal University of Ireland, and in the following year, after gaining the Dunville studentship and senior scholarship in chemistry at Queen's University, he graduated B.A with first-class honours In 1919 he obtained his medical qualifications in Queen's, again with first-class honours, which then, as now, was a rare achievement

His first teaching post at Queen's was in the physiology department, from which he went on to be Riddell demonstrator in pathology During this period he added a B SC to his name, again with first class honours He travelled abroad and studied in Paris and Budapest After this he carried on his research work while he was with the R A.M C in the B E F, attached to Sir Almroth Wright's laboratory Later he used to recall how in those early days they did blood transfusions without grouping On soldiers suffering from trench nephritis the first blood ureas were done, and in these war years Thomson did the first series of blood-urea estimations in prostatic obstruction He never published these, but his work on war nephritis appeared in 1918 In 1910 he had obtained an M D with gold medal, thus completing an academic career whose lustre has rarely if ever been equalled in the annals of Queen's University

It was only natural that a man of his attainments should serve in the teaching of others and shortly after his return to Belfast, in 1923, he was appointed professor of medicine Five years later he was elected a fellow of the Royal College of Physicians of London He served on the staff of the Mater Hospital before his appointment as assistant physician to the Royal Victoria Hospital in 1918 He became full physician in 1923-24 when he was given charge of wards He had the rare gift in teaching of making difficult subjects plain to those less gifted, and his clinical lectures and demonstrations in the Royal Victoria Hospital were always crowded with eager students

Though serious illness which developed soon after he had been appointed professor, threatened for a time to cut short his career, he recovered and once more resumed his teaching and his hospital and private practice Besides his work on war nephritis, he published papers on bronchial carcinoma and the renal aspects of essential hypertension In 1939 he delivered the Lumleian lectures before the Royal College of Physicians, choosing as his subject Primary Carcinoma of the Lung

each of these three is the better for its association with the other two" The authors suggest that 'in a satisfactory health service the family doctor should play an even more important part than in the past because the real battle for the child s health is fought in the home and the family doctor is most familiar with the social and environmental conditions" Furthermore health centres by providing for family doctors, school and child welfare clinics health visitors, and district nurses, should promote coöperation between family doctors and local authority workers and thus enhance the efficiency of the child health service The need for more and better buildings in this region (as in most) is clamant but 'though better buildings are needed the doctors and nurses and their helpers are more important than the walls within which they work.' This well balanced survey will doubtless be the forerunner of others

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University of Cambridge

The Raymond Horton-Smith prize for 1949-50 has been awarded to Dr A. G E Pearse Trinity College for his essay on Cytochemistry and Secretory Cytology of the Anterior Hypophysis Dr B G Parsons-Smith, Trinity College, was the runner up with an essay on the Value of Electro-encephalographic Study in Cases of Cerebral Tumour

University of London

The title of reader in anatomy in the university has been conferred on Dr R J Harrison in respect of his post at Charing Cross Hospital Medical School

Royal College of Surgeons of England

A series of exhibitions and demonstrations are being held in the college on Dec. 13 the day of the annual meeting of fellows and members In the department of physiology there will be an exhibition and demonstration of the scientific equipment and the department of pathology will show recently acquired specimens illustrated by photomicrographs microradiographs and radiographs including groups illustrating diseases of the vertebral column treatment of malignant disease of the bony pelvis by hind quarter amputation, and visceral hydatid disease The department of anatomy will also display recent specimens including dissections of the binturong ("Whiskers' from the Zoo) the neck of the darter and the submandibular glands of the tamandua New additions to the odontological collection will also be on view Among research exhibits will be preparations showing the development of the ureter the comparative anatomy and physiology of the subepithelial system and human lungs injected with Marco resin, together with models showing the development of the lung of a child The general department will show some of the college plate and a selection of the illuminated addresses presented in connection with the 150th anniversary In the library there will be shown recent acquisitions of historical and new books, gifts of autograph letters and bookplates selections from the collection of engravings, and biographies of fellows The exhibitions will be open from 2 P.M onwards Mr William Doolin will give the Thomas Vicary lecture at 4 P.M. and the meeting of fellows and members will be held at 5 30 P.M

Infectious Tuberculous in London

The Minister of Health has approved in principle the provision by London County Council of hostel accommodation for people with tuberculosis who are infectious but are unlikely to benefit by further sanatorium-treatment and who have either no home or no suitable home The Minister s approval is given on the understanding that the cost shall not increase the Council s total expenditure under Part III of the National Health Service Act Earlier the Minister rejected a plan to construct on the site of St Peter s Hospital Stepney a night sanatorium and industrial workshops (see *Lancet* Oct 28 1950 p 491)

Supplies of Aureomycin

A plant for the production of 'Aureomycin is nearing completion at Hirwaun, South Wales At this plant, which is being built by the Lederle Laboratories division of Cyanamid Products Ltd work will be confined to purifying crude aureomycin and encapsulating and packaging the refined product Production is expected to satisfy domestic demands as well as providing for exports The company is investigating the possibility of creating in Britain a plant for the complete manufacture of this antibiotic

Royal Society

On Nov 30 Prof E D Adrian, O.M, was elected president of the society

Professor Adrian became president on his 61st birthday He has held the Foulerton research professorship of the society and he is professor of physiology in the University of Cambridge where except for his hospital work at Barts as a student and his service in world war I he has worked since his student days A pupil of the late Dr Keith Lucas he has continued and amplified the work of that pioneer in neurophysiology and he was awarded the Nobel prize in medicine in 1932 For many years he has served on the committee of the Physiological Society he has acted as its secretary for 3 years and he was editor of the *Journal of Physiology* for 10 years In 1942 he was appointed to the Order of Merit His other distinctions include the Royal medal (1934) the Copley medal (1946) the Croonian lectureship (1931) the Ferrier lectureship (1938) and the Baly medal (1929) His published papers deal mostly with the properties of nerve fibres and with investigations on the central nervous system Electro-encephalography rests almost entirely on his fundamental investigations and he was largely responsible for the development of techniques by which the passage of the sensory impulses may be traced from the sensory nerve-endings to the cerebral cortex

Dr I de Burgh Daly, Prof Wilson Smith, and Dr V B Wigglesworth were elected members of the council of the society

Fluoride in Drinking-water

The American Water Works Association convention in Detroit was told by Dr Chester Tossy that at Grand Rapids, Michigan, putting fluoride in the drinking water for the last six years had reduced dental caries by more than 60% He also said, according to B U.P that within the next ten years most U S cities would be adding fluoride to their drinking water the cost to each ratepayer was only about 2*d* a year Dr A P Black, of the University of Florida, suggested that fluorination of drinking water was the biggest step in public health in the last hundred years'

Beds in Swiss Sanatoriums

The members of the clinical team who will shortly visit Switzerland to study the medical facilities available there for the treatment of patients with pulmonary tuberculosis are Dr M A Foulis, physician superintendent, Robroyston Hospital, Glasgow, Dr R Y Keers medical director, British Red Cross Sanatoria in Scotland Miss G M M Carter, matron East Fortune Sanatorium, East Lothian Dr I M Macgregor, medical officer Department of Health for Scotland

Their visit arises out of the preliminary inquiries into sanatoria facilities carried out by officers of the Department of Health for Scotland at the beginning of November On their return Miss Margaret Herbison joint parliamentary under secretary of State for Scotland announced that their report was sufficiently encouraging to justify a visit by clinical experts

New Science Centre

In his farewell address as president of the Royal Society Sir Robert Robinson announced that the following scientific societies were taking part in the new centre Biochemical Society British Association Chemical Society, Faraday Society Geological Society Linnean Society London Mathematical Society Physical Society Physiological Society Royal Anthropological Institute Royal Astronomical Society Royal Meteorological Society, Royal Society Royal Statistical Society, Society of Chemical Industry Many of the smaller scientific societies and clubs would continue to receive hospitality I am disappointed,' he added that it is not possible for me to enlarge on the contribution which the science centre building should make to the aspect of the new London Nor can I expatiate on the famous landmarks that may be visible from its windows Suffice it to say that we believe the site when finally selected and approved will be found to be entirely satisfactory not only in area but also in position There is no doubt that it will offer a great opportunity to an imaginative architect and it will be easily accessible from other parts of London

It is probable that the scientific societies will be housed in a worthy and impressive building such a one as could look Somerset House in the face and it is agreed that this will have the most prominent position on the site The quarters for the various societies will be separate with their own entrances, very much in the same way as here at Burlington House He hoped the tercentenary of the foundation of the Royal Society in 1960 would be celebrated in their new home

Notes and News

HAZARDS OF FLUID THERAPY

ADDRESSING the Manchester Medical Society s section of medicine on Nov 1, Dr D A K Black referred to some of the dangers of indiscriminate treatment with intravenous fluids Although the value of suitable treatment with saline or glucose solutions was well established, their use might also give rise to harmful effects, which were the more dangerous in that they might come on insidiously Despite Marriott's work, saline fluid was still given when a non saline fluid would be more appropriate, and vice versa Clinically, a complaint of thirst should suggest predominant water depletion, and signs of peripheral circulatory failure predominant salt depletion The estimation of serum sodium was the most direct biochemical method of distinguishing between salt and water depletion The test for urinary chloride might be misleading in the presence of acidosis or alkalosis, or of renal or suprarenal disease

Apart from giving the wrong type of fluid, it was also possible to give excessive amounts of the correct type of fluid This was well appreciated with saline fluid, but the dangers of excessive intake of watery fluid were less well known In anuria it was essential to restrict the intake of water as well as of salt, and there was also a risk of water intoxication in the period following surgical operations, in which, as Coller and his associates had shown, the elimination of water was seriously impaired There was a danger of producing significant acidosis when large amounts of normal saline were given to correct salt depletion in severe salt depletion it was better to give a fifth of the required sodium as lactate When alkalosis was caused by excessive alkali administration ammonium chloride could safely be given, but when alkalosis was due to vomiting, it was associated with salt depletion, and normal saline was more suitable than ammonium chloride A low alkali reserve might be due to respiratory alkalosis, and not to metabolic acidosis, for example in salicylate poisoning the low alkali reserve was a sign of respiratory alkalosis, and sodium bicarbonate might not be the best treatment Caution was very necessary in the intravenous administration of potassium Potassium infusions should be given very slowly, to avoid cardiac arrest, and the oral route was much to be preferred, whenever and as soon as practicable

In conclusion, Dr Black disclaimed any wish to set up a new specialty of applied electrolyteology, and suggested that those undertaking fluid therapy should ask themselves three questions, which could often be answered clinically (1) Do we need to give fluid at all ? (2) Do we give saline or non saline fluid ? (3) Have we given enough, or too much, fluid ? Healthy kidneys were a great help in correcting mistakes in fluid administration and after all most of the patients survived

"UNESTABLISHED" GENERAL PRACTITIONERS

A WELL ATTENDED meeting of unestablished general practitioners took place in London on Nov 29 Dr J H Edgar, who was in the chair, summarised a statement prepared by the committee which had arranged the meeting Dr Edgar advocated reduction of the maximum size of lists to 3000 patients, an expenses allowance of £600 to form part of the remuneration of all general practitioners and removal of the restrictions on transfers These proposals were designed to help the 'squatter' and other principals with small lists He went on to say that the system of assistantships without a view to partnership should be abolished and meanwhile the conditions of employment of assistants should be safeguarded by Regulation Lastly, he pointed out that doctors should be attracted to "undesirable' areas by financial inducement, and not forced there by economic pressure In the subsequent discussion two points were emphasised (1) that the transfer regulation was an intolerable obstacle to the small list practitioner and the would be principal many speakers indicating that it had already caused them hardship, and (2) that the system of permanent assistantships without a view to partnership had no place in the National Health Service Dr Edgar declared that the number of assistantships with a view had dropped to 60% of that in the previous year and that the intake of new patients by 'squatters" had fallen to 15% of the number prior to the transfer restrictions

Dr Edgar, speaking on behalf of the organising committee suggested that adequate representation of unestablished practitioners could best be achieved by the formation of a special group of the British Medical Association. In the discussion it became apparent that there were three arguments in favour of this maintenance of the unity of the profession, simplicity of organisation and the possibility of direct representation on the General Medical Services Committee Nevertheless, there was a definite body of opinion in favour of a separate association A resolution for an application to the council of the British Medical Association for the formation of a special group was carried by a substantial majority

SYRINGES FOR INSULIN INJECTION

A NEW British standard for hypodermic syringes for insulin injection has been published This standard (B S 1619/1950) is based on the standard for hypodermic syringes for use in medical and surgical practice (B S 1263) and covers all glass as well as metal and glass syringes The specification is designed to cater for the special requirements of diabetics who normally perform their own injections, and the scale is marked in twentieths of a millilitre, to enable them to estimate more readily their dosage requirements Two sizes of syringe are given, with nominal capacities of 1 ml and 1 5 ml Dimensions of the conical tip are given exactly, being identical with, and interchangeable with, the American Luer tip (as in B S 1263) Copies of this standard may be obtained (price 2*s* 6*d*) from the sales department, British Standards Institution, 24 Victoria Street, London, S W 1

BLINDNESS DUE TO HEREDITARY DISEASE

IN Norway Holst[1] has investigated the causes in 3181 cases of blindness Among this total those who become blind in old age may not be fully represented, for members of this group are commonly overlooked, and this must be borne in mind in judging his observation that almost half (1555) of the 3181 cases were due to hereditary disease Earlier surveys have suggested that hereditary disease is the cause in a much smaller proportion—one third or less Holst's records of blindness due to hereditary disease include 10[9] cases of congenital atrophy of the optic nerve 263 of retinitis pigmentosa, 304 of congenital cataract, and 145 of glaucoma simplex He is prepared to defend his inclusion of glaucoma simplex among the hereditary causes, but he is more diffident about including 33 cases of senile cataract As regards prevention Holst remarks that Hitler's pseudo scientific experiments in genetics may have spoiled the prospects of practical work in this field for a long time to come but we must continue to face the possibility of sterilisation or a ban on the marriage of persons with a family history of hereditary blindness, taking each case on its merits In Norway between 1945 and 1949 four women and one man were sterilised with a view to preventing blindness in the next generation As for the non hereditary cases, Holst draws attention to the importance of methanol which accounted for 42 of the 50 cases due to poisoning

REGIONAL CHILD-HEALTH SURVEY

SOMETHING new in regional surveys has been undertaken by Prof John Craig and Dr Joan Burrell In their review of child life and health in the North Eastern (Aberdeen) Region of Scotland[2] they outline the pædiatric services and with special reference to the year 1948, report on the children's health so far as this can be judged from official medical reports hospital admissions and mortality rates The region, with a population of 501,000, includes the island counties of Orkney and Shetland—isolated communities which contrast in many ways with the mainland area One point that emerges from an analysis of the number of mental defectives in the various parts of the region and of the facilities provided for them, is that only Aberdeen City gives adequate special education to the educable members of this group and that in all areas there is a lamentable lack of homes for the non educable An account of the development of the teaching of child health includes the observation that "teaching and research determine the character of the care of children and

1 Holst J C Blindhetsarsaker i Norge En Oversikt Utarbeidet av Gjenlæge Oslo 1950

2 Pædiatrics in the North Eastern (Aberdeen) Region of Scotland By John Craig M B F R C P E professor of child health, and Joan Burrell M B D R C O G assistant in child health University of Aberdeen Aberdeen University Press 1950 Pp 4

ON CLINICAL MEDICINE*

F M R WALSHE
M.D, D Sc, F.R C.P, F.R.S
CONSULTING PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL

TODAY student and practitioner of medicine live in a fast-changing world of medicine, and do not breathe the stable and peaceful air in which, some forty years ago, I took my infant steps in medicine

Then, clinical medicine seemed a simple and all-embracing conception of our activities To misuse some words of Tennyson, "Her court was pure, Her reign serene," and we allowed ourselves only the venial infidelities of occasional excursions into a simple and limited clinical pathology, into what was called Public Health and Forensic Medicine, with some comic interludes—as we then thoughtlessly regarded them—into vaccination (to which no less than six lectures were devoted) and mental diseases, to which we gave as little time as we could. But with a fine sense of where our true love was to be found, namely, at the bedside or in the outpatient clinic, we did not allow these philanderings to distract us unduly from our allegiance to her

Some of us still remain singleheartedly devoted to her, but we are a pathetic, a diminishing and, if the truth is to be told a dilapidating band of ancient lovers wearing our archaic graces with a faintly ridiculous air

The sad fact today is that clinical medicine, as we see her in that cosmopolitan crush known as the curriculum, is a damsel in distress with scarce a champion, her rights disputed by a growing band of bold faced competitors, each of whom is wooed and praised by a more oddly assorted band of suitors than ever sought the hand of Portia or Penelope Their names are legion, industrial medicine, social medicine, psychological and psychosomatic medicine, geriatrics, and so on—bigger and better names than ever we knew of forty years ago A new debutante is now with us Her name is 'adaptation stress" and if we can be cajoled into making an honest woman of her, she will we may be sure, be the fertile mother of her own litter of specialists

All these and more are—to change my metaphor—the new lamps for old with which persuasive magicians seek to seduce the medical Aladdin in his youth and innocence

And if all this is tempting to us, what a brave new world it offers to the community The citizen, from cradle to grave, and at the price of a weekly stamp, may hope to be accompanied on his harassed journey through life by relays of specialists the obstetrician, the pædiatrician, soon of course the pubertician and the climacterician (subgroups of the species endocrinologist), and other experts in school and factory, until finally he declines, decrepit and exhausted, into the eager hands of the geriatrician and his sequent colleague the mortician having enjoyed through all stages of the unequal contest a wide choice of psychiatric first aid

There is I believe, a useful convention by which the pædiatrician passes us on at the age of 12 to his successor on the medical convevor belt in our Welfare State When, I ask my trembling contemporaries, does the hour strike at which we are passed on to the geriatrician to have our old bones trained for the Olympian games?

* * *

If my remarks do not seem to you sufficiently serious in form for the occasion, I humbly submit that they are not without substance, for the state of affairs I have sketched is surely the logical conclusion of much *modern talk* and planning on medical services and medical education

Nearly a century ago a wise man said that the nonsense talked on education outweighed all the other nonsenses put together, and suspecting that this aphorism contains more than a little of the truth where we are concerned, it has seemed to me worth while to trace the growth of clinical medicine since the age of Sydenham, to see what has happened to it and what we are making of it in the medical education and practice of today Is the clinical method still as important as Sydenham believed it to be?

* * *

Modern clinical medicine owes its birth to Sydenham who bridged the long gap between the ancient and the modern medical worlds by a return to the Hippocratic discipline This rebirth was virtually contemporary with that of physiology What, in the 17th century, Harvey did for physiology by the method of experiment, Sydenham did for medicine by the introduction of clinical study

These two sources of inspiration and method in medicine have now joined to make a mighty stream, but what I am suggesting is that those of us who are, or who intend to be, practising doctors, the clinical source is still the primary one

As we trace the development of clinical medicine since its renaissance in the 17th century, we see the appearance of a succession of new insights, of new and often opposing schools of thought, each of them dominant for a time perhaps in one country more than in another, but then coalescing with earlier and with later influences to swell the main stream of medicine as we see it today

Each new insight, each new method of approach seems to have made the progress of knowledge swerve from the course upon which it was set, and this in virtue of the excess inherent in all new doctrines that have vitality and are expounded by men of force and genius, for there is an element of excess in all greatness

The pendulum of doctrine has never ceased to swing, and those whose efforts have disturbed, while they have sped, the steady march of progress, have always been persuaded that they were putting medicine on its true and final course at last The illusion of dogmatic finality is no monopoly of the theologian, but is an ineradicable element in the human mind

The impression of a changing and unstable equilibrium which the history of modern medicine gives us, should perhaps make us charitable to, and patient with, some of the current enthusiasms and apparent aberrations of thought in medicine Each of these contains its grain of truth, but not the whole truth, and partial truths not recognised as such, can be very dangerous

What I shall call partial truth, or partial thinking is still our gravest danger in medicine, and, surrounded as we now are by a vast and growing mass of diverse information, it is scarcely surprising that this should be so

Looked at from this point of view, the brief and incomplete story of clinical medicine in the past three hundred years which I now give, may have a lesson for us in our time

* * *

It was Sydenham who gave to clinical medicine the place of honour as a scientific discipline which, in my submission, it has never lost He sought by the direct study of sick persons to write a natural history of diseases Abandoning the theories and the abstract systems of his predecessors, he set out to describe visible signs and symptoms with accuracy and precision, to form notions of their combinations and sequences in illness of different kinds and thus to form concepts of disease He was the founder of nosography

In this he displayed a fine clinical flair, an eye for the relevant and a capacity for discarding the irrelevant Like all truly scientific observation, his was selective

* The Schorstein lecture delivered at the London Hospital on October 19, 1950

Royal Society of Medicine

On Dec 1, Lord Webb Johnson presented the Henry Hill Hickman medal to Dr R J Minnitt at a meeting of the anæsthetics section of the society

Medical Honour

The King has appointed Surgeon Lieutenant D S Macphail to be a member of the military division of the Order of the British Empire

"for courage skill and determination when he was dropped by parachute into Yugoslavia in May, 1944 and in spite of the very primitive conditions and the scarcity of medical supplies established a hospital for the Partisans"

Royal Sanitary Institute

The health congress of the institute will be held at Southport next year from April 23 to 27 The following presidents of sections have been appointed Sir John Charles (preventive medicine), Prof T H Davey (tropical hygiene), Dr A Massey (hygiene in industry) Further particulars may be had from the Institute, 90, Buckingham Palace Road, London, S W 1

Manx Chemists

The 34 chemists on the Isle of Man who withdrew from the health service on Nov 13 have now accepted the prescription and container charges which were the cause of their dispute with the Health Services Board It is understood that they have received an assurance that in future they will be given prior notice of any new regulations affecting the pharmaceutical service The board's decision to debit 6d to the chemists' accounts for every prescription dispensed by them between Oct 1 and Nov 13 is to be the subject of negotiation During the 18 days of the "strike," the 7 chemists who remained in the service dispensed about 150 prescriptions a day between them these were collected and distributed by the police authorities

Medical Inspectorate of Mines

Dr T E Howell has been appointed principal medical inspector of mines in succession to Dr S W Fisher, who has retired on reaching the age limit

Dr Howell was born in 1900 near Risca Monmouthshire and attended various village schools before serving with the Royal Air Force during the 1914–18 war Before beginning to study medicine he worked for some years in the coal mining industry and he obtained a first-class mine manager's certificate In 1934 he qualified from Guy's Hospital and three years later took his M B Lond After a period in general practice he returned to Guy's as registrar and chief clinical assistant to outpatients, at the same time holding the post of pathologist to the Evelina Hospital for Sick Children In 1938 he joined the factory department of the Home Office as medical inspector of factories in charge of the south western region After five years during which time he was also lecturer in industrial medicine at Bristol University he left the factory department to join the Ministry of Fuel and Power as deputy chief mines medical officer For several months during 1946 he was loaned to the Ministry of Labour to deal with difficulties in connection with recruitment of miners for work in the Ruhr coal fields and he recently represented the Ministry at a congress of industrial medical officers in Vienna His interests, apart from his work are animal genetics and farming

Births, Marriages, and Deaths

BIRTHS

BAILIE —On Nov 29 in Belfast, the wife of Mr H W C Bailie F R C S E —a son

CLAREMONT —On Nov 25 in London the wife of Dr Hugh Claremont—a son

GLADSTONE —On Nov 27 at Woodstock, the wife of Dr G P Gladstone—a daughter

HADFIELD —On Nov 24 in London the wife of Dr Gordon Hadfield—a daughter

LAUBER —On Nov 24 in London the wife of Dr H C Lauber —a son

POMFRET —On Dec 2 at Southsea the wife of Surgeon Captain A A Pomfret O B E R N —a son

MARRIAGES

MANSON BAHR—GROSSMITH —On Nov 25 at Tandridge Sir Philip Manson Bahr M D to Edith Mary Grossmith

NEWTON—ROMANES —On Nov 25 at Brockham Green William Boyd Newton M D to Sheila Margaret Stewart Romanes

SMELT—KNIGHT —On Nov 25 at Warblington Hants Charles Michael Casterton Smelt captain R.A.M.C., to Joan Anne Rosemary Knight

WARLOW—OAKLEY —On Dec 2 in London Allan Llewellyn Warlow M R C.S to Joan Astrid Oakley

DEATHS

BARFORD —On Nov 29 James Leslie Barford M R C.S D P M

DEMPSEY —On Nov 25 in Dublin Timothy Gerard Dempsey M.B N U I

EVANS —On Nov 26 Jessie Downie Granger Evans M D Lausanne

HUTCHINSON —On Dec 2, at Bury Lancs Gladys Hilda Hutchinson M B Manc

Diary of the Week

DEC 10 TO 16

Monday, 11th

MEDICAL SOCIETY OF LONDON 11, Chandos Street Cavendish Square W 1
8 30 P M. Pathological meeting

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28 Portland Place W 1
4 30 P M Sir Leonard Parsons F R S Historical Background the Unborn Child (First Harben lecture)

Tuesday, 12th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M (London School of Hygiene Keppel Street W C 1) Dr K W Donald Definition and Assessment of Respiratory Function (First lecture)

CHELSEA CLINICAL SOCIETY
7 P M (47 Queen's Gate Terrace S W 7) The Very Rev Hewlett Johnson, D D Health and Education East of the Iron Curtain

INSTITUTE OF DERMATOLOGY St John's Hospital Lisle Street, W C 2
5 P M Dr J O Oliver Pathology

CIBA FOUNDATION 41 Portland Place, W 1
5 P M Sir Stanton Hicks The Rôle of Suprarenal Cortical Function in Disorders of Childhood

PADDINGTON MEDICAL SOCIETY
8 30 P M (St Mary's Hospital W 2) Prof C A Pannett Restraint in Surgery

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
4 30 P M Sir Leonard Parsons The Newborn Child and the Infant (Second Harben lecture)

EDINBURGH POST GRADUATE BOARD FOR MEDICINE
5 P M (Edinburgh University Anatomy Theatre) Prof. H L. Sheehan Renal Cortical Necrosis

Wednesday, 13th

ROYAL COLLEGE OF SURGEONS Lincoln's Inn Fields W C 2
4 P M Mr William Doolin Dublin's Surgeon Anatomists (Thomas Vicary lecture)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE
4 30 P M Sir Leonard Parsons The Older Child a Glance into the Future (Last Harben lecture)

INSTITUTE OF DERMATOLOGY
5 P M Dr O W McKenny X ray Technique

ASSOCIATION OF SEA AND AIR PORT HEALTH AUTHORITIES
11 30 A M (90 Buckingham Palace Road S W 1) Dr Mary Lennox Publicity and Port Health

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW 242 St Vincent Street Glasgow C 2
5 P M Professor Sheehan Renal Cortical Necrosis (Weild lecture)

Thursday, 14th

ROYAL COLLEGE OF SURGEONS
3 P M Prof L Witts Ocular Aspects of Blood Dyscrasias

UNIVERSITY OF LONDON Senate House W C 1
5 30 P M Sir Stanton Hicks Food and Folly (Sanderson Wells lecture)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 P M Dr Donald Definition and Assessment of Respiratory Function (Second lecture)

ST GEORGE'S HOSPITAL MEDICAL SCHOOL Hyde Park Corner S W 1
4 30 P M Dr Anthony Felling Neurology lecture-demonstration

INSTITUTE OF DERMATOLOGY
5 P M Dr E J Moynahan Bites and Stings

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE 26 Portland Place W 1
7 30 P M Dr J R Audy Scrub Typhus in Burma and Malaya

ALFRED ADLER MEDICAL SOCIETY
8 P M (11 Chandos Street W 1) Dr Edward F Griffith Initiation

LONDON JEWISH HOSPITAL MEDICAL SOCIETY, Stepney Green E 1
3 P M Clinical meeting

LIVERPOOL MEDICAL INSTITUTION 114 Mount Pleasant, Liverpool 3
8 P M Dr R E Rowell Pathology of Captive Wild Animals

TORQUAY AND DISTRICT MEDICAL SOCIETY
8 30 P M (Torbay Hospital Torquay) Mr Norman Lake Surgical Aspects of Hypertension

HONYMAN GILLESPIE LECTURE
5 P M (Edinburgh University Anatomy Theatre) Dr J C McCrie Reflections from a Provincial Deanery

Friday, 15th

MAIDA VALE HOSPITAL MEDICAL SCHOOL Maida Vale W 9
5 P M Mr Valentine Logue Clinical neurological demonstration

INSTITUTE OF OPHTHALMOLOGY Judd Street W C 1
5 30 P M Mr G I Scott Clinical Perimetry

BIOCHEMICAL SOCIETY
2 P M (Department of Biochemistry and Chemistry Medical College St Bartholomew's Hospital E C 1) Short papers.

UNIVERSITY OF EDINBURGH New Buildings Teviot Place Edinburgh 8
2 30 P M Prof Ian Aird Surgical Exposure of the Pancreas (Macarthur lecture)

FACULTY OF RADIOLOGISTS
2 15 P M *Diagnosis Section* (Royal College of Surgeons) Dr R A Kemp Harper Mr I G Williams Thymic Tumours in Myasthenia Gravis

Saturday, 16th

ASSOCIATION OF BRITISH NEUROLOGISTS
10 A M (National Hospital Queen Square W C 1) Dr F C Lumsden Basic Problems in the Pathology of Disseminated Sclerosis and Demyelinating Disease (First Florence Tong lecture)

In a measure these German enthusiasts were right when they declined to accept a "disease" as a natural entity, as something in nature In nature there are for the practising doctor only sick persons, and the composite average picture of disease we construct from the study of like illnesses in different persons is not something concrete, but simply a mental construct, and what the German physiological school was rejecting was what has been called "the fallacy of misplaced concreteness" Yet in exposing a logical error in current notions, they went too far when they denied the specific characters of many different illnesses which the insight of their predecessors had identified In popular language, they threw out the baby with the bath water—as enthusiastic reformers are so apt to do—and failed to realise that descriptions of different forms of illness, nosography, remains and must always remain essential to the clinician

Nevertheless, this physiological epoch in the medicine of the 19th century, incomplete as were its insights, was a great, nay an essential, step in the forward growth of medicine, and it had the additional and priceless merit that it saw the introduction of the experimental method in medicine

Yet, here also, history repeated itself, and once more an outlook that transformed the face of medicine came in a measure, and for a time, to distort perspective, as when Virchow, ignoring the art of medicine, proposed that practical medicine should become applied theoretical medicine Under his influence, the strength of which it is now difficult for us to appreciate who have no towering figures in medicine comparable with the giants of 90 or 100 years ago, the clinical method and nosography in general became disparaged, its progress delayed and the art of medicine ignored I sometimes think that even yet the clinician has not wholly regained that pride in his discipline which its exacting nature and its record of achievements demand, and is prone to accept too easily and to apply uncritically the facts he is offered from the experimental laboratory

The same attitude towards the clinical method was shown by Claude Bernard in France when he invited the physician to desert the bedside for the laboratory in his search for knowledge, since he—as many lesser men since—believed the clinical method of study was worked out like an exhausted vein of precious metal in a mine

Yet while Virchow and Bernard were writing obituaries of the clinical method, Charcot and Trousseau in France and Hughlings Jackson and others in this country were still demonstrating what the clinical method could achieve not only in nosography, but also in the philosophic understanding of normal and disease processes After all, the clinician is perhaps the best judge of the usefulness of his methods

Trousseau, indeed it was, who made one of the first steps in the next essential condition of advance in medicine, when he proposed "that what gives the specific diseases their immutable properties is not the quantity but the quality of the morbific cause" thus opening the stage of ætiological inquiry in medicine To each particular cause of disease the system reacts with specific and characteristic phenomena In other words, when we endeavour to construct typical clinical pictures we are taking a first step to track down some specific pathological cause

At the time of Trousseau's death in 1867, Pasteur was engaged upon brilliant studies of the cause of fermentation and putrefaction the fruit of which was to establish that many diseases were reactions to specific micro organisms, and bacteriology was born

Neither time nor your patience would allow me to discourse upon the revolutionary influence of what has been called the germ theory of disease upon medicine My point rather is that this also, by its very success, tended to give a too exclusive outlook to the generation in which it developed and achieved its so striking triumphs

Causation in disease was a larger and more complex problem than had yet been envisaged, and was the subject of a great deal of partial thinking—still current amongst us in those simple souls who like to see in chronic and obscure ill health the work of that nebulous concept "focal infection" A cynic has said that to "find a germ and stop thinking" is still the preoccupation of too many amongst us

We have, in fact, forgotten Aristotle and his four orders of causation—material, formal, efficient, and final—and we are painfully relearning them in a terminology of our own, too often without realising that it is only a process of rediscovery

In short, intemperate enthusiasms of doctrine still sway us, and perhaps never more than now when we see psychiatry and psychosomatic medicine running neck and neck, each seeking to become the master notion in modern medicine

* * *

We have seen, then, in our time the progressive widening of our notions of causation, of ætiology, in disease To bacteriology have been added insights derived from chemistry, biochemistry, and now physics, and from the intermittent and often smoky light of psychology

From all this mass of knowledge, a more philosophic notion of causation is taking shape, and has found expression with admirable lucidity and conciseness in a paper by Dr J L Halliday, entitled Principles of Ætiology, published in the *British Journal of Medical Psychology* in 1943 I could wish that this paper were far more widely known, for it is the best synthesis of a complex problem that I have met, and should be an admirable corrective to those recurrent accesses of dogmatic and partial thinking which, generation after generation, have disturbed the steady and rational process of growth in medicine

A stage has now been reached when we realise that we have become increasingly dependent in medicine upon the application of biological and physical science to the solution of our problems To take but a few obvious examples the value of the X ray film in the diagnosis of carcinoma of the lung, and its application of arteriography in the detection of intracranial aneurysm, and those blood and body fluid examinations of almost infinite diversity which are needed for the elucidation of problems that clinical observation raises but cannot by itself resolve

In short we may now be said, in a military metaphor, to have "a force of all arms" at our disposal in the recognition, study, and treatment of disease

What, amidst this profusion of resources, is now the place and importance of clinical observation by the trained senses, which at one time comprised virtually the entire activity of the physician? Has it been displaced? May we relegate it to the realm of the obsolete? Is its pursuit a mere archaism?

We are now in a period of unprecedentedly rapid growth in medicine, and it would be foolish, and contrary to history, to suppose that we are not even now exposed to all the dangers of partial thinking Indeed, with the growth of our resources these dangers multiply, and I fear that the notion of clinical observation as a largely worked out method, as in some of its aspects an archaism, even more the notion that it has no secrets left to yield to its followers, have appeared amongst us and are in fact another manifestation of partial thinking

I am suggesting to you the idea that perhaps the more balanced view is that for the clinician there is a hierarchy of methods at his disposal, and that, as in all hierarchies, one comes first and is indispensable

The devastating epidemics of contagious diseases in the London of his day provided him with a rich material for study, and he succeeded in differentiating smallpox, cholera, plague, measles, scarlet fever, chorea, and that dignified malady of more spacious days, gout His descriptions of smallpox and of gout are classics that can be read with profit today

Sydenham gave a great impulse to clinical medicine throughout Europe, but his work was not based upon any systematic knowledge or study of morbid anatomy, and his successors of the 18th century degenerated into mere classifiers, adding nothing new but creating an arid discipline of cataloguing and subdividing symptoms The ultimate aim of medicine could never be the mere development of nosography that is the differentiation and naming of a morbid state and its reference to a descriptive category Changes in bodily function and structure, and factors of causation of disease were also necessary subjects of study and of knowledge if power over disease was to be achieved Clinical study could not advance indefinitely in a vacuum, as it were, and without a parallel study of anatomical and physiological factors

The necessary impulse which started medicine off once more in the stream of progress came from France, where in the early 19th century Bichat and Corvisart developed a systematic pathological anatomy, and the clinicopathological method was born

It is easy now, and in some quarters popular, to decry what is called "deadhouse pathology," "scorning the base degrees by which we did ascend," but its study was an imperative condition of progress in medicine, and it remains a step which we must still tread today

Bichat advanced from the notion of diseased organs to that of diseased tissues For example, he pointed out that the inflammation of a serous membrane gave rise to phenomena of two orders those peculiar to all serous membranes, and those determined by the organ in which the serous membrane was situated and of which it was a part

Thus, pleurisy peritonitis, meningitis lead to general and to special or localising symptoms Looked at today this notion of Bichat's seems an obvious and an easy one, and those who have never skirmished on the frontiers of ascertained knowledge in medicine, or any other branch of science, may not know how hard-won are these flashes of intuition, these fertile generalisations, how revealing when they are achieved, and how immensely satisfying to the earnest seeker after light in dark places They come from what Trotter has spoken of as the unresting contemplation of the facts of observation a contemplation we are apt to be far too busy nowadays to secure for ourselves

Corvisart, following Bichat, undertook the precise study of pathological changes in tissues and organs and sought to correlate them with clinically observed disorders This step made possible another one Up to this time clinical observation had been essentially an ocular matter the patient was looked at rather than systematically examined For clinical examination as we know it, we owe the first steps to Laennec, who sought to discover in the living subject the changes in the organs hitherto seen only post mortem His great weapon to this end was the method of auscultation by the stethoscope, and by means of it he was able to form some judgment of the actual changes present in heart and lungs

I doubt if most of us now have the amazing skill with the stethoscope which the older physicians of my student days achieved, though I used sometimes to suspect that some of the ultimate refinements of auditory perception, with accounts of which some auscultatory artists used to regale us, were little imaginative Perhaps it is no longer essential that we should possess this degree of artistry, for other methods have come to lend us, and to lend us more easily and more certainly, some of the information gained by the stethoscope But what the long bow was at Creçy, so was the stethoscope to our fathers in medicine, an essential weapon Despise it not, nor suppose that the X ray film is the universal and adequate substitute for its use. A stethoscope can go into any man's pocket, but we can't trail an X ray plant and its operators round to every bedside.

Thus Laennec was able to construct a new series of clinicopathological pictures of disease, to distinguish the diverse pathological changes in the lungs, and in particular to form a unitary conception of pulmonary tuberculosis.

Those who followed him developed his methods, and gradually clinical medicine began to assume the form it still retains in essence, despite the vast accessions to knowledge that have ensued since his day

From France, the new impulse spread First, perhaps, to the Dublin school of medicine where Graves, Stokes Adams, Cheyne, and Corrigan gave their names to new clinicopathological complexes, and thereafter to this country where Addison, Bright, Parkinson, and others added further clarifications and nosological additions to knowledge

* * *

It is perhaps difficult for us now at this time to realise what a revolution these few fertilising geniuses achieved in a few years Out of the formless welter of chronic illness, fresh clinicopathological entities were isolated so that all could identify them and know them in their clinical and pathological aspects

Even yet, however, clinical medicine was obviously incomplete, and became threatened by a stagnation of the same order that followed the impulse originally imparted to it by Sydenham, and the tendency to think of disease complexes as static concrete entities began to show itself What was missing was the notion of ætiology, and the notion of process. There was no awareness of the fact that structural change must be preceded by functional change, and that disorders of function presupposed normal function The notion of disease as disorder of normal function was necessary to the further evolution of medicine

The new impulse to the introduction of physiological ideas in medicine may be said to have come from Germany from the middle third of the last century onward There it gained strength and effected yet another revolution in medicine Even here, perhaps, the germinal idea came from France, and from the physiologist Magendie, who explicitly refused to accept a true distinction between physiology and pathology, and emphasised that post mortem findings of themselves could not account for all the clinically observed phenomena

Nevertheless, it was really in Germany that physiological medicine, as its exponents proudly called it, came into its own The study of disordered function and the interpretation of signs and symptoms in terms of function became the intense and fruitful study of men whose names are still familiar Schwann, Remak, Henle, Traube, Virchow, Wunderlich, and others

* * *

It would be difficult to overestimate the achievements of these men, and hard perhaps for some to appreciate the intellectual ferment in which they worked Their aim was to penetrate deeper than the descriptive disciplines which were dominating medicine, and to understand the processes at work in disease

To probe behind phenomena and to seek the principles they exemplify is the first step in a philosophy of medicine, for philosophy is the attempt to understand things by their causes

Yet, as I have already observed, there is excess in all greatness, and once again the pendulum of opinion swung too far The notion of process led inevitably to a distrust of the notion of specific diseases and their classification into groups, like animals or plants

In a measure these German enthusiasts were right when they declined to accept a "disease" as a natural entity, as something in nature In nature there are for the practising doctor only sick persons, and the composite average picture of disease we construct from the study of like illnesses in different persons is not something concrete, but simply a mental construct, and what the German physiological school was rejecting was what has been called "the fallacy of misplaced concreteness" Yet in exposing a logical error in current notions, they went too far when they denied the specific characters of many different illnesses which the insight of their predecessors had identified In popular language they threw out the baby with the bath water—as enthusiastic reformers are so apt to do—and failed to realise that descriptions of different forms of illness, nosography, remains and must always remain essential to the clinician

Nevertheless, this physiological epoch in the medicine of the 19th century, incomplete as were its insights, was a great, nay an essential, step in the forward growth of medicine, and it had the additional and priceless ment that it saw the introduction of the experimental method in medicine.

Yet, here also, history repeated itself, and once more an outlook that transformed the face of medicine came in a measure, and for a time, to distort perspective, as when Virchow, ignoring the art of medicine, proposed that practical medicine should become applied theoretical medicine Under his influence, the strength of which it is now difficult for us to appreciate who have no towering figures in medicine comparable with the giants of 90 or 100 years ago, the clinical method and nosography in general became disparaged its progress delayed and the art of medicine ignored I sometimes think that even yet the clinician has not wholly regained that pride in his discipline which its exacting nature and its record of achievements demand, and is prone to accept too easily and to apply uncritically the facts he is offered from the experimental laboratory

The same attitude towards the clinical method was shown by Claude Bernard in France when he invited the physician to desert the bedside for the laboratory in his search for knowledge, since he—as many lesser men since—believed the clinical method of study was worked out like an exhausted vein of precious metal in a mine.

Yet while Virchow and Bernard were writing obituaries of the clinical method, Charcot and Trousseau in France and Hughlings Jackson and others in this country were still demonstrating what the clinical method could achieve, not only in nosography, but also in the philosophic understanding of normal and disease processes After all, the clinician is perhaps the best judge of the usefulness of his methods

Trousseau, indeed it was, who made one of the first steps in the next essential condition of advance in medicine when he proposed "that what gives the specific diseases their immutable properties is not the quantity but the quality of the morbific cause" thus opening the stage of ætiological inquiry in medicine To each particular cause of disease the system reacts with specific and characteristic phenomena In other words when we endeavour to construct typical clinical pictures we are taking a first step to track down some specific pathological cause.

At the time of Trousseau's death in 1867, Pasteur was engaged upon brilliant studies of the cause of fermentation and putrefaction the fruit of which was to establish that many diseases were reactions to specific micro organisms, and bacteriology was born

Neither time nor your patience would allow me to discourse upon the revolutionary influence of what has been called the germ theory of disease upon medicine My point rather is that this also, by its very success, tended to give a too exclusive outlook to the generation in which it developed and achieved its so striking triumphs

Causation in disease was a larger and more complex problem than had yet been envisaged, and was the subject of a great deal of partial thinking—still current amongst us in those simple souls who like to see in chronic and obscure ill health the work of that nebulous concept "focal infection" A cynic has said that to "find a germ and stop thinking" is still the preoccupation of too many amongst us

We have, in fact, forgotten Aristotle and his four orders of causation—material, formal, efficient, and final—and we are painfully relearning them in a terminology of our own, too often without realising that it is only a process of rediscovery

In short, intemperate enthusiasms of doctrine still sway us, and perhaps never more than now when we see psychiatry and psychosomatic medicine running neck and neck, each seeking to become the master notion in modern medicine

* * *

We have seen, then, in our time the progressive widening of our notions of causation, of ætiology, in disease To bacteriology have been added insights derived from chemistry, biochemistry, and now physics and from the intermittent and often smoky light of psychology

From all this mass of knowledge, a more philosophic notion of causation is taking shape, and has found expression with admirable lucidity and conciseness in a paper by Dr J L Halliday, entitled Principles of Ætiology, published in the *British Journal of Medical Psychology* in 1943 I could wish that this paper were far more widely known, for it is the best synthesis of a complex problem that I have met, and should be an admirable corrective to those recurrent accesses of dogmatic and partial thinking which, generation after generation, have disturbed the steady and rational process of growth in medicine

A stage has now been reached when we realise that we have become increasingly dependent in medicine upon the application of biological and physical science to the solution of our problems To take but a few obvious examples the value of the X ray film in the diagnosis of carcinoma of the lung, and its application of arteriography in the detection of intracranial aneurysm, and those blood and body fluid examinations of almost infinite diversity which are needed for the elucidation of problems that clinical observation raises but cannot by itself resolve

In short we may now be said, in a military metaphor to have 'a force of all arms" at our disposal in the recognition, study and treatment of disease

What, amidst this profusion of resources, is now the place and importance of clinical observation by the trained senses, which at one time comprised virtually the entire activity of the physician? Has it been displaced? May we relegate it to the realm of the obsolete? Is its pursuit a mere archaism?

We are now in a period of unprecedentedly rapid growth in medicine, and it would be foolish, and contrary to history, to suppose that we are not even now exposed to all the dangers of partial thinking Indeed, with the growth of our resources these dangers multiply, and I fear that the notion of clinical observation as a largely worked-out method, as in some of its aspects an archaism even more the notion that it has no secrets left to yield to its followers, have appeared amongst us and are in fact another manifestation of partial thinking

I am suggesting to you the idea that perhaps the more balanced view is that for the clinician there is a hierarchy of methods at his disposal and that, as in all hierarchies, one comes first and is indispensable

I am suggesting that for the good clinician the clinical method—the method of history-taking and direct examination—takes primacy, and that without it, and the lead it gives the prudent doctor, medicine becomes a chaos of activities and techniques, a blind fumbling after the truth in any particular case

It is the first clinical survey and judgment that determines what devices of applied science should be used and in what sequence, what special tests can be expected to yield a relevant answer and what cannot

All this clinical survey demands of us something over and above the skilled employment of applied scientific methods It demands experience and prudence, or practical wisdom

In short, if I am right in my view, the clinical method of direct observation and examination has in it an element of practical wisdom, which the employment of scientific techniques of itself does not possess It is relatively easy to acquire techniques, but judgment in their use is the reward of clinical experience carefully garnered Judgment is of the essence of the clinical method in its fullness It is easy to perform a lumbar puncture, but it is not so easy to know when and when not to perform it It is simple to do an air ventriculogram, but apparently not so simple to know when to refrain from doing it—though indeed I have heard a surgeon say "it does nobody any harm to have air put into his ventricles"—naturally it was of someone else's ventricles that he was thinking when thus he spoke

* * *

I return now to my military metaphor, that in which I spoke of the clinician facing his tasks of diagnosis and treatment with a force of all arms at his disposal: clinical, chemical, biochemical, physical, bacteriological, pathological, radiological, and so on

Each such task that faces him is a different one, even the patient is no constant, but a sum of his inheritance, constitution and environment, and of the psychological influences that have helped to mould him Therefore each task calls for generalship in the use of the available resources Now a skilled general does not throw all his forces into every battle in an indiscriminate fashion He chooses his weapons and the circumstances and the moment when he shall use them In other words he uses judgment His judgment may be fallible, the event may falsify it Nevertheless, he remains aware that judgment, discrimination, and foresight are qualities expected of him and necessary to the maximal efficiency of his activities

So each of us needs to show generalship in the use of our resources, and this generalship requires as a condition of its possession by us, clinical observation and clinical judgment And, further, this generalship, as I am calling it, is demanded of us not only because it is a logical use of reason, but also on grounds of prudence, that prudence that bids us cherish first of all the welfare of our patients

Now, you may say that it is never prudent to leave anything to chance, that more mistakes are made from carelessness than from ignorance There is an element of truth in this, but it is not a justification for indiscriminate investigation, which is unintelligent, wasteful, and often a cause of discomfort and hazard to the patient We still have the responsibility to plan systematically, to employ each test for an end we can both specify and justify, and to refrain from forms of investigation that can offer no relevant information and can promise no benefit to the patient

I suppose it would not be an exaggeration to say that every day many hundred square yards of X ray films are unnecessarily exposed and many man hours of radiographers' time—not to mention a deal of money—are squandered Pathologists and bacteriologists could, I feel sure, echo my complaint on this score

I am not advocating a deliberate archaism of method, a refusal to be up to date, I am simply seeking to stress that the more resources we have the greater demand their use makes upon our intelligent forethought They are demands upon clinical judgment and not substitutes for it

It will be time enough for us to reproach the State for the number of forms it requires the doctor to complete, when we have put some check upon our own private orgies of chit signing to the laboratory departments of our profession

* * *

It seems to me, therefore, that there are two lessons we may learn from the history of modern medicine, lessons for the teacher not less than for the taught. That the clinical discipline is the real and only sound foundation of wisdom in the practice of medicine. Secondly, that a great safeguard against partial thinking and specialist enthusiasms is, at least for those who teach medicine, some measure of understanding of the history of modern medicine This does not simply mean familiarity with the chronicles of medicine, which is what is commonly understood by the term "the history of medicine" After all, chronicles are merely the raw material of history What we need is some appreciation of the movements of thought, the rise of new insights—their good and their bad influence Modern medicine is rooted in its past, and of that past we should seek to understand the significance Such an understanding is surely vital to the teaching of medicine Only when we possess it can we hope to orient ourselves in the rapidly growing body of knowledge and avoid the errors and illusions of finality of our predecessors and of some of our contemporaries

The one enduring and unbroken thread which runs through the past three centuries of medical history, sometimes hidden in the rich and intricate fabric of medical knowledge, but always holding it together and lending coherence to its pattern, is the clinical discipline Without it, medicine must become a chaos of techniques employed by clever people devoid of humanism and practical wisdom

ADJUVANTS TO STREPTOMYCIN IN TREATING TUBERCULOUS MENINGITIS IN CHILDREN

I A B CATHIE M.D Lond
CLINICAL PATHOLOGIST

J C W MACFARLANE M D B Sc Glasg
ASSISTANT CLINICAL PATHOLOGIST

THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET, LONDON

OUR purpose is to amplify the preliminary communication of one of us (Cathie 1949b) on the use of streptokinase as an adjuvant to streptomycin in the treatment of tuberculous meningitis, and to compare the results with those of other treatment centres

From February, 1947, when streptomycin became available for the treatment of tuberculous meningitis under the auspices of the Medical Research Council's trial (first 14 cases), until November, 1949, 60 cases have been admitted to the Hospital for Sick Children for treatment (table 1) The first 20 (series A) were treated with streptomycin alone, and 5 (25%) of these are at present alive, of whom 4 have normal cerebrospinal fluid (C S F)

This survival rate of 25% which accords with many other comparable published figures, was a great disappointment to us, and we felt that, although streptomycin could cure some of the cases (which no drug hitherto had been able to do) some other form of adjuvant therapy must be included if the survival rate was to be improved.

We report here the results in 40 patients (series B), of whom 23 (58%) have survived, 17 with normal C S F, and discuss the adjuvant forms of therapy which have been used and which may have contributed to the improved survival rate

MATERIAL

Except for 2 cases which were treated independently and were not available to us, the cases in our two series were consecutive hospital admissions, and none has been excluded because of the severity of the condition or the shortness of the period of treatment Table II shows that the series are comparable as regards age, severity, and presence or absence of miliary tuberculosis, as was to be expected when the children were consecutive admissions

All the cases were proved bacteriologically, and all the patients were Mantoux positive The youngest child was aged 4 months, and the oldest 12 years Since the last admission in series B was in November, 1949, all the patients referred to were under observation

TABLE I—ANALYSIS OF CASES

Case no	Age on admission (years)	Severity	Miliary tuberculosis present or absent	C S F		Signs of raised intracranial pressure	Treatment				Length of observation since admission (weeks)	Results	
				Film	Culture		Intraventricular drainage	No of 6 week I T courses	Sulphatrone	Streptokinase		Weeks with normal C.S F	Final state
1	2½	S	−	+	+	+	−		−	−	25		Died
2	4	S	−	+	+	+	−		−	−	3		
3	½	M	+	+	+	+	−		−	−	30		
4	8	M	−	+	+	+	−		−	−	165	102	Recovery with nerve deafness
5	3	M	+	+	+	+	−		−	−	8		Died resistant organism
6	½	S	−	+	+	+	−		−	−	15		Died
7	7	M	−	+	+	+	−		−	−	18		"
8	2	M	−	−	−	+	−		−	−	22		"
					G.P +								
9	1	M	−	+	+	+	−		−	−	8		
10	2	M	+*	−	+	+	−		−	−	19		
11	11	M	+	+	+	+	−		−	−	29		
12	1¾	M	+	+	+	+	−		−	−	7		
13	7	S	−	+	+	+	−		−	−	141	*52*†	C.S F contained 14 cells per c.mm after 52 weeks Complete clinical recovery
14	2	E	+	+	+	+	−		−	−	1		Died
15	6	E	+*	+	+	+	+		−	−	51		
16	1½	E	+*	+	+	−	−		−	−	132	108	Complete recovery
17	2½	E	−	+	+	+	+		−	−	142	103	Recovery with mental deficiency
18	3½	S	−	+	+	+	+		−	−	24		Died
19	1¾	E	+*	+	+	+	+		−	−	18		Died resistant organism
20	7	S	−	+	+	+	+		−	−	126	69	Recovery with slight residual hemiplegia
21	1½	E	−	+	+	+	+	2	+	+	73		Relapsed after normal C.S.F and died
22	13	S	−	+	+	−	−	1	+	+	126	81	Complete recovery
23	11	M	+	+	+	+	+	1	+	+	19		Died
24	3¼	M	+	+	+	−	−	3	+	+	115	16	Complete recovery
25	¼	E	+	+	+	−	−	1	+	+	107	95	
26	3½	S	−	−	+	+	+	1	+	+	7		Died
27	5¾	M	−	+	+	+	+	1	+	+	106	60	Recovery with slight residual hemiplegia
28	¼	S	+	−	+	+	+	1	+	+	20		Died
29	3	E	+*	+	+	−	−	1	+	+	105	80	Complete recovery
30	3¾	M	−	+	+	−	−	1	+	+	103	70	
31	½	S	−	+	+	+	+	2	+	+	102	74	Recovery with gross hydrocephalus and mental deficiency
32	¾	M	−	+	+	+	+	1	+	+	102	63	Complete recovery
33	2½	S	−	+	+	+	+	1	+	+	24		Died
34	1	M	+	+	+	+	+	1	+	+	11		
35	2½	M	+	+	+	−	−	2	+	+	14		Died resistant organism
36	1	E	+*	+	+	+	+	2	+	+	28		Died
37	¾	M	−	−	+	+	+	1	+	+	98	*67*†	C.S.F protein 200 mg per 100 ml Complete clinical recovery
38	4½	M	−	+	+	+	+	1	+	+	95	58	Complete recovery
39	½	M	−	+	+	+	+	1	+	+	16		Died
40	5½	E	−	+	+	+	+	2	−	+	14		Died resistant organism
41	1½	E	+*	−	+	−	−	2	−	+	60	9	Complete recovery
42	5	E	−	−	+	−	−	1	−	+	68	20	"
43	4¾	M	+	+	+	+	+	1	−	+	66	33	"
44	2¼	S	−	+	+	+	+	1	−	+	65		Died
45	4	S	+	+	+	+	+	2	+	+	17		Died resistant organism
46	1¾	M	+	+	+	+	+	1	−	+	62	34	Complete recovery
47	7	M	−	+	+	−	−	1	+	+	61	31	
48	5½	S	+	+	+	+	+	2	+	+	9		Died
49	3½	M	−	+	+	+	+	1	+	+	15		
50	5¾	M	−	+	+	−	−	2	+	+	56	*9*†	C.S F 18 cells per c.mm Complete clinical recovery
51	6¼	E	+	+	+	−	−	1	+	+	50	31	Complete recovery
52	3¼	M	+	+	+	−	−	1	+	+	48	7	
53	2	M	−	+	+	+	+	1	+	+	11		Died
54	1¾	E	+	+	+	+	+	2	+	+	32		
55	1¼	M	−	+	+	−	−	1	+	+	36	*14*†	C.S F 8 cells per c.mm Complete clinical recovery
56	3¼	M	−	+	+	−	−	1	+	+	32		C.S.F 34 cells per c mm protein 60 mg per 100 ml, sugar normal for 5 weeks Complete clinical recovery
57	4½	E	+*	+	+	+	+	1	+	+	32	*1*.†	C.S F 32 cells per c.mm Complete clinical recovery
58	3	M	−	+	+	−	−	1	+	+	30		C.S.F 8 cells per c mm protein 50 mg per 100 ml, sugar normal for 4 weeks. Complete clinical recovery
59	½	E	−	+		+	+	1	+	+	29	5	Complete recovery
60	3	M	−	+	+	+	+	1	+	+	8		Died

* Cases developing meningitis while on treatment for miliary tuberculosis † The period is italicised where some abnormality remained. Cases 25 and 32 developed spinal caries after 80 and 9 weeks respectively in which their C S.F was normal, and in neither case has there been relapse of meningitis Case 38 developed tuberculous arthritis of the knee after 12 weeks with normal C.S F without meningeal relapse

TABLE II—HOMOGENICITY OF SERIES A AND B AS REGARDS AGE, SEVERITY OF ILLNESS, AND PRESENCE OF MILIARY TUBERCULOSIS

Series	Age (yr)		Miliary tuberculosis		Severity of illness on admission		
	Below 3	Above 3	Present	Absent	Early	Moderate	Severe
A (20 cases)	11 (55%)	9 (45%)	5 (25%)	15 (75%)	5 (25%)	9 (45%)	6 (30%)
B (40 cases)	18 (45%)	22 (55%)	13 (33%)	27 (67%)	11 (27%)	21 (53%)	8 (20%)

for at least six months and so, if they survived, received our standard six months' intramuscular treatment

BACTERIOLOGY

Of our 60 cases 1 was treated partly at another hospital, where *Myco tuberculosis* was seen but cultures were not made This leaves us with 59 cases In 58 (97%) of these the *Myco tuberculosis* was grown on culture, in the other it was grown from guineapig inoculation From the beginning the routine was to wait for a fortnight for cultures to become positive on Lowenstein Jensen's medium, if at the end of this time there was no apparent growth, guineapigs were inoculated with the pooled sediment remaining from routine lumbar punctures This was necessary three times, although in two of these cases the initial cultures became positive after it had been thought necessary to inoculate a guineapig With such a high rate of positive cultures there was no reason to alter this routine, which proved very economical of guineapigs

Of the 59 patients seen from the start of their illness *Myco tuberculosis* was found on direct examination of the C S F in 52 (88%) The determining factor in this high rate of positive films seems to have been their method of preparation after centrifugation the part of the sediment to be examined was deposited in pinhead drops on the slide By this means it was possible to examine the whole deposit rather than the small portion which is examined when such a drop is smeared.

From the 59 cases the initial culture was sensitive to streptomycin, the greatest concentration necessary to inhibit growth being 0 5 μg per ml. No organism was more than twice as resistant as the standard strain of *Myco tuberculosis*, H37Rv (cf Medical Research Council 1948)

Every specimen of C S F was cultured as a routine In addition, where possible, necropsy samples were cultured Five strains completely resistant to 2000 μg of streptomycin per ml were recovered from the 32 patients who died, giving an incidence of 8 3% in our 60 cases This does not agree with other workers' findings and may possibly be due to the routine culturing of all C S F samples

All our patients were Mantoux positive, and treatment was not instituted in the face of a negative reaction except in 1 child who proved to have a cerebellar tumour Where practicable we have proceeded straight to a strength of 1/100 We have seen no reaction, local or general, of such violence that we have regretted it, and it avoids the occasional loss of forty eight hours while waiting for a 1/1000 test to prove negative

CEREBROSPINAL FLUID

Normal—We regard normal C S F as having at least 45 mg of sugar per 100 ml 40 mg or less of protein per 100 ml, and 4 or fewer cells per c mm We have adhered rigidly to these criteria in calling a C S F normal

Abnormal—We have nothing to add to the findings of the Medical Research Council (1948) or those of Rubie and Mohun (1949), MacCarthy and Mann (1950), and others The C S F chloride level gave us little help The C S F-glucose level was the most consistent aid in diagnosis and prognosis, and indicator of recrudescence. The shortest time in which the C S F returned to normal was twelve weeks (case 25) On the other hand, case 11 has been off all treatment for two years and back at school for one and a half, yet, with a normal chemistry for a year, his C S F still has 14 cells per c mm, with no tendency for them to diminish. Although as the result of the treatment he may have established new normals for himself, we cannot by our criteria call him a complete recovery

METHODS

The first 14 cases of series A were treated with continuous intramuscular streptomycin for six months and periods of a month's daily intrathecal streptomycin by the lumbar route with intervening rests The dosage was that recommended by the Medical Research Council (1948) In the last 6 cases of series A the number of intrathecal injections was gradually reduced Series B was treated with the same dosage of intramuscular streptomycin for six months, and the intrathecal course aimed at was daily for a fortnight, every other day for a fortnight and every third day for a fortnight, making a total of twenty four intrathecal injections At the end of such a course intrathecal therapy was stopped to see what would happen in the C S F If the C.S.F showed signs of improvement, no further intrathecal treatment was given, but, if there was any sign of deterioration, a further six week course was given Particular attention was paid to the C S F glucose level

'Sulphetrone' and streptokinase were added to the streptomycin with each intrathecal injection in series B, except for 6 who received no sulphetrone The dose of sulphetrone was 0 05 g for children under the age of 3 years and 0 1 g for older children Streptokinase was given in doses of 0 5 and 1 ml respectively to these age groups, the titre of the preparation being about 1/600 (Cathie 1949a)

Ventricular drainage was used in series B whenever it was considered necessary

SULPHETRONE

After a visit to Prof C Cocchi's clinic in Florence in 1947, where we were impressed by his results with streptomycin and sulphone, we decided to incorporate a sulphone in our treatment At that time sulphetrone seemed to be the least toxic (Brownlee et al 1948a and b), so we chose that We soon found that to obtain C.S F levels of 1 5 mg per 100 ml with oral or intramuscular sulphetrone we had to give toxic doses Since such levels were roughly only a hundredth of the bacteriostatic level for *Myco tuberculosis*, we decided to give intrathecal sulphetrone in doses of 0 05 or 0 1 g This seemed to have little irritant effect on the meninges and mixed readily with streptomycin Unfortunately 50% of the sulphetrone so given was excreted within six hours, and at twenty four hours only 2–5 mg per 100 ml remained Since, however, sulphetrone was thought to have a synergistic action with streptomycin it was given in 34 cases

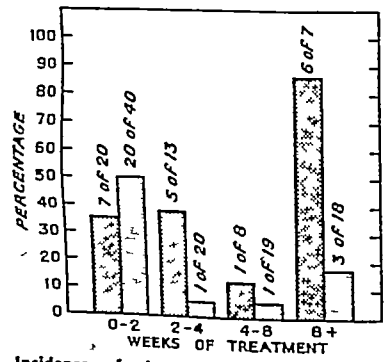
After 19 cases had been treated with streptomycin, streptokinase, and sulphetrone, and it had become clear that the results were improving considerably, sulphetrone was omitted from the next 6 cases so that the part played by it could be assessed We then felt it desirable to reintroduce the sulphetrone for the remaining 15 cases of series B while the 6 who did not receive it were being observed Of the 34 treated with sulphetrone 19 (56%) are alive Of the 6 who did not receive it 4 survived Although the numbers are too small to be of much value they confirm an impression that sulphetrone plays little part in recovery from tuberculous meningitis, and we are not using it any longer In this conclusion we are supported by that of the Veterans' Administration (1949), whose streptomycin results were not improved

in 43 cases in which 'Promizole' was used as the sulphone adjuvant Before a final opinion can be reached on the value of a sulphone the results of Professor Cocchi (see below) and those of Lincoln and Kirmse (1949) must be considered. Lincoln and Kirmse reported that 13 out of 18 cases appeared to be doing well 3–6 months after treatment had started with promizole as an adjuvant, and a follow up of these cases is awaited with interest

STREPTOKINASE

In the search for some adjuvant which would promote lysis of the fibrinous exudate in tuberculous meningitis we turned to streptococcal fibrinolysin, or streptokinase (Cathie 1949a), and a preliminary report of its apparent efficacy was published (Cathie 1949b) Briefly, it was found that streptokinase could in vitro lyse fibrinous exudate taken from the base of the brain post mortem Streptokinase has also unblocked an internal hydrocephalus in a *Hæmophilus influenzæ* meningitis and, when given alone, has caused tubercle bacilli to reappear in the C S.F in cases where treatment had been abandoned

Streptokinase was standardised on fibrin clots prepared from plasma which were comparable to the spider's web clots of C S F in cases of tuberculous meningitis Assuming that a hundredfold dilution occurred when 1 ml was injected intrathecally, a preparation was used whose potency was such that a dilution of 1/600 could lyse our standard clot in an hour By our method of preparation streptokinase was miscible without deposit only with the calcium free salts of streptomycin When given alone intrathecally it caused a pleocytosis similar to that seen with streptomycin, with some small increase in the amount of protein Occasionally it gave rise to pyrexia, but in no case in series B did it cause a reaction severe enough to lead to its omission



Incidence of signs of raised intracranial pressure hatched columns series A, stippled columns series B

In series A, when streptokinase was not available, signs of increased intracranial pressure were present at some time in 19 of the 20 cases, these signs came on in the first fortnight in 7 cases and later in 12 In series B, all of whom had streptokinase, similar signs were present in only 25 cases out of 40, coming on in the first fortnight of treatment in 20 cases and later in 5 It seems reasonable to suppose that streptokinase, if it can affect the exudate, would take some time for its effect to become manifest We have therefore considered indications for intraventricular catheterisation arising within the first fortnight and subsequently after the start of treatment In series A, without streptokinase, these indications were seen later in 12 out of 20 cases (60%) After the introduction of streptokinase, in only 5 cases out of 40 (12%) was catheterisation considered necessary after the first fortnight The accompanying figure shows the percentages of those patients at risk who developed signs of raised intracranial pressure in series A and B in the first fortnight and subsequently

Case 37 was atypical in that he presented with signs of a block in the dorsal region, confirmed by a myelogram Tubercle bacilli and a protein content of 3400 mg per 100 ml were found in the lumbar C.S.F, whereas C S.F obtained by cisternal puncture was almost normal 1 ml of 1% methylene blue injected into the ventricle did not stain the lumbar C.S F The patient was treated with streptokinase alone for a month, 1 ml on alternate days by the ventricular and lumbar routes Methylene blue was first detected in the lumbar C S F after ventricular injection at the end of three weeks The patient was next treated with intrathecal streptomycin, and made an excellent clinical recovery but the lumbar C S F still contains 200 mg of protein per 100 ml. after ninety eight weeks observation

VENTRICULAR DRAINAGE

In considering series A we were bound, like other workers, to be struck by the overwhelming incidence of hydrocephalus, both at necropsy and as demonstrated by air encephalography in the survivors So near was this incidence to 100% that it seemed reasonable to institute ventricular drainage at the start of treatment as a prophylactic measure Yet some patients recovering with hydrocephalus appeared entirely normal, hence catheterisation was reserved for those cases in which we felt that there was a clear indication that relief of intracranial pressure would alleviate the symptoms

The indications for ventricular drainage and their incidence were as follows

Indication	*No of cases*	*% of total*
Coma, or increasing drowsiness	27	62
Papilloedema or blurring of optic disc	29	66
Intractable vomiting	27	62
Fits	16	36
Changes in the lumbar flow of C.S.F	14	31
Generalised spasm	10	23

Though any single one of these indications would have warranted catheterisation, with the exception of blurred discs they seldom occurred singly In a few cases a rapid general deterioration in the patient's state without particular symptoms led us to insert catheters, and in every such case the intracranial pressure was found to be greatly increased.

At first intraventricular catheterisation was regarded as a major operation, and secondary sepsis was feared We are now less frightened of sepsis, catheterisation is usually done by the resident surgeon, and for ease of nursing and the comfort of the patient an anterior approach to the lateral ventricle is chosen In infants with the fontanelle still open direct needling of the lateral ventricle is easily done, and there is consequently no need for catheterisation

An advantage of catheters, apart from the relief of pressure, is that therapy can be given by the ventricular route, and thus rest can be given to the lumbar area as well as the patient, moreover, in those infrequent cases where the hydrocephalus is internal there might theoretically be an advantage in attacking the exudate from above Also, whereas release of excess C S.F via the lumbar route may predispose to coning of the cerebellum into the foramen magnum, ventricular drainage should tend to prevent this

RECRUDESCENCE AND RELAPSE IN RELATION TO 6 WEEKS' INTRATHECAL TREATMENT

In our early cases we had felt that perhaps we were overtreating by the intrathecal route, particularly in view of the known toxic effects of streptomycin Therefore in the last 6 cases of series A the number of intrathecal injections was progressively reduced, because it was thought that we were not likely to obtain worse results than 2 survivors out of 14 The clinical response in 3 of these 6 was sufficiently encouraging for us to decide to aim at a six week course in series B Actually these 3 survived

Only 1 of our patients (case 21) has shown a true relapse, which came on three months after the C.S.F. had become normal An attack of measles after the child had apparently recovered may have contributed to this, although the child was admitted and treated with intramuscular streptomycin during the illness In 5 other children, who showed excellent clinical improve

ment and a C S F returning to normal, there was a relatively sudden deterioration in the C S F followed by clinical relapse They all died, and in each case the tubercle bacillus was later shown to have become completely streptomycin resistant 2 of these cases were in series A one had had continuous intrathecal treatment until death, and the other had had an eleven week intrathecal course The 3 other cases, in series B, had had the six week intrathecal course

Three of series B (cases 31, 41, and 50) were given a second six week course because, although the clinical condition was good, the C S F sugar level was not considered satisfactory, they all survived 3 children (cases 36, 48, and 54) had a second intrathecal course because the C S F did not improve after the end of the first and the clinical condition had deteriorated concomitantly, they all died In case 24, after completion of intrathecal and 6 months' intramuscular streptomycin therapy the C S F remained abnormal After six weeks tubercle bacilli reappeared, and the patient was given another six months' intramuscular streptomycin and two six week intrathecal courses with apparent recovery The C S F in this child has now been normal for four months

With our rigid criteria of C S F normality, only case 21 can be called a true relapse, and the others, in some of whom the C S F was approaching normal, are regarded as recrudescences For this reason we are chary of mentioning cases "doing well," and little is yet known of the prognostic significance of a C S F that remains abnormal

In series B, besides the 3 cases with streptomycin resistant tubercle bacilli, the 3 who died in spite of further treatment, and the 1 who died in relapse, there were 10 who after six weeks were either dead or in such a hopeless state that treatment was abandoned These 10 would have had the same outcome whatever the intrathecal course of steptomycin Thus there were 23 cases out of 40 who recovered with the six week intrathecal schedule 19 after a single course, 3 after a second six week course, and 1 after six months' re treatment We are well aware that the adjuvant therapy played a part in the recovery rate, but the figures show clearly that as good survival rates may be obtained with 24 intrathecal injections as by treating with intrathecal streptomycin for much longer periods or until a normal C S F is attained

Of the 3 strains of streptomycin resistant tubercle bacilli 2 were grown in the twelfth, and 1 in the fifteenth, week of illness, in each case after many weeks of sterile cultures In no case was developing resistance seen, adjacent positive cultures being sensitive and totally resistant We do not know whether longer or shorter periods of intrathecal treatment than six weeks would avoid this catastrophe, nor have we sufficient cases to answer the question, but, following the Medical Research Council's (1949) report we have added *p* aminosalicylic acid (given by mouth) to the battery of drugs in the hope that the number of resistant strains will diminish

TABLE III—COMPARISON WITH RESULTS OF OTHER CENTRES

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Series B	40	40	Unsel	23 (58%)	17 (43%)

OTHER RESULTS

The results published from other treatment centres which have had large enough series of cases are summarised in table III Much of the information is obviously unsatisfactory In some instances the cases were selected because of their likely response to streptomycin therapy, in others meningitis with miliary spread was excluded, and in some there is doubt whether the cases were proved or not

There is little information about the final state of the C S F Since some of the patients were still under treatment, this is not surprising, but, since the persistence of abnormality in the C S F may be of prognostic significance, we have felt that it is essential for the C S F to be normal before a case can be regarded as a recovery

Table III shows that Professor Cocchi (reported by Pasquinucci 1949) divided his cases into three series all treated with sulphone and different schemes of streptomycin dosage We do not know how well the third series has done, because at the time of publication many patients were still under treatment, but the second series, with 47% survivors and 42% with normal C S F out of 66 unselected proved cases, bears favourable comparison with anything yet published Since the first series of 57 cases, with 23% survivors and 14% with normal C S F, was, like the second series, also treated with sulphone as an adjuvant, the variation being in streptomycin dosage, we feel that the greatly improved results point to the streptomycin dosage rather than to the sulphone as the responsible factor

Cocchi (1949) thinks combined treatment with streptomycin and sulphone makes for less frequent development of streptomycin resistance in the tubercle bacilli, as has been suggested for that with streptomycin and *p* aminosalicylic acid Our results with sulphetrone do not answer this question either way

In his third series it is noteworthy that Cocchi is using intraventricular catheterisation, and he is optimistic about the ultimate results The other treatment is as in the second series

DISCUSSION

The results we have obtained with the scheme of treatment outlined do not suffer by comparison with any others In attempting to evaluate the adjuvants which have increased the survival rate we are bound to be perplexed by their number and the difficulty in assigning a part to each We are not at present in a position to pass final judgment on sulphetrone, although our impression that it is not of great value finds support in the experience of other workers and possibly from Cocchi's results

We are convinced that ventricular drainage is a life saving measure in acute hydrocephalus and should be resorted to wherever there are indications of a raised intracranial pressure But this measure is entirely symptomatic, and can have no effect upon the tuberculous process

It is our view that streptokinase has been the most important single factor in the improvement in the second series of cases By its effect it may predispose to earlier healing, but its major effect has been in the reduction in the number of cases which developed signs of a raised intracranial pressure (19 out of 20 in series A, against 25 out of 40 in series B) The indications of its positive, rather than prophylactic, value have already been pointed out Judging by the requests we have received for streptokinase for cases of established hydrocephalus, there seems to be some misconception of the part it can play While in our experiments we have found streptokinase to be capable of lysing gelatinous exudate it has no effect on fibrous tissue at all, and to try and lyse the organising exudate usually present by the time hydrocephalus has appeared with a fibrin lysin is to attempt the impossible Thus streptokinase must be given from the commencement of treatment if its full effect is to be obtained, and we have found it is of no value late in the disease

The last point in favour of the scheme of treatment outlined is that our results have been achieved with, on the average 24 intrathecal injections This clearly holds advantages over the present tendency to treat intrathecally until a normal C.S.F is achieved, particularly if the time necessary to attain such a result is considered from the patient's point of view

Finally, we feel that no patient can be treated by a hard and fast scheme or rhythm of injections. Cases of tuberculous meningitis differ so widely from one another that every case should be treated with some régime that will permit of almost indefinite variation

SUMMARY

The results obtained in two comparable series of tuberculous meningitis are presented

In a series of 20 cases treated with streptomycin alone there were 5 (25%) survivors, 4 with normal C.S.F

In a series of 40 cases treated with streptomycin, streptokinase most of them with sulphetrone and intraventricular drainage where indicated, there were 23 (58%) survivors, 17 with normal C S.F

The part played by the adjuvants used in the series of 40 cases is discussed.

The results obtained by other treatment centres are summarised

We are greatly indebted to the physicians of The Hospital for Sick Children, under whose care the cases were and particularly to Prof A A. Moncrieff for his constant interest Thanks are also due to the nurses, on whose shoulders the burden of treatment has fallen, and to our surgical colleagues for help with the catheters

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TREATMENT OF ACUTE BARBITURATE POISONING

A COMPARISON OF NIKETHAMIDE AND AMPHETAMINE*

JOHN RIISHEDE

ASSISTANT PHYSICIAN, MUNICIPAL HOSPITAL, AARHUS, DENMARK

From the University Medical Clinic of the Hospital

EARLIER investigations of barbiturate poisoning have proved the importance of active therapy aimed partly at removal of the ingested poison from the body and partly at maintaining the fluid salt balance and the circulation It is only during recent years that these conditions have been fully understood, and the clinician has only lately appreciated the necessity for frequent assessment of the state of the circulatory and the fluid salt balance

The object of the present study was to compare the value of nikethamide and of amphetamine as cerebral and circulatory stimulants in the treatment of acute barbiturate poisoning A total of 193 patients with barbiturate poisoning were treated on exactly the same principles, except that in the first 61 cases nikethamide was used as a stimulant and in the subsequent 132 cases amphetamine The mortality in the amphetamine series was only a fifth of that in the nikethamide series, moreover, the cases in the amphetamine series had an obviously less eventful course, with fewer complications

MATERIAL

The material comprises the cases of acute barbiturate poisoning admitted to the University Medical Clinic in Aarhus from Nov 1, 1946, to June 1, 1949 Slight cases in which stimulation was not required, or in which only prophylactic stimulation was used, are not included

TREATMENT

In all the cases, without exception, the treatment was as follows

(1) Aspiration of the stomach and gastric lavage with 10 g of medicinal charcoal in 250 ml of water, followed by instillation of 30 g of medicinal charcoal and 15 g of magnesium sulphate in about 500 ml of water

In patients who on admission were comatose or later lost consciousness the following measures were taken

(2) Stimulation with nikethamide or with amphetamine

(3) Stimulation of peristalsis with neostigmine 1 mg four hourly till carbon had been evacuated per rectum or the patient was awake

(4) Prophylactic measures against pneumonia with sulphonamides or penicillin, or both.

(5) Parenteral administration of at least 2–3 litres of fluid per twenty four hours to maintain the fluid balance

Every comatose patient was placed in bed with his head low, and mucus was aspirated from the larynx as long as the comatose and semicomatose state lasted, this was done with an ordinary water suction pump If necessary, mucus was removed from the trachea and bronchi by bronchoscopy The pulse-rate and temperature were recorded every hour, and the blood-pressure and hæmoglobin percentage every second hour A catheter was passed twice every twenty-four hours, and serum protein, serum-chloride, serum bicarbonate, and blood urea levels were determined once every twenty-four hours If the hæmoglobin percentage increased more than 10% ("imminent shock"), or if signs of manifest shock were found a blood transfusion was given—generally 1 litre at a time Pulmonary œdema was treated by intravenous strophanthin (0 25 mg) and 50% solution of glucose (100 ml), in one case

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ment and a C S.F returning to normal, there was a relatively sudden deterioration in the C S F followed by clinical relapse They all died, and in each case the tubercle bacillus was later shown to have become completely streptomycin resistant 2 of these cases were in series A one had had continuous intrathecal treatment until death, and the other had had an eleven week intrathecal course The 3 other cases, in series B, had had the six week intrathecal course

Three of series B (cases 31, 41, and 50) were given a second six week course because, although the clinical condition was good, the C S F -sugar level was not considered satisfactory, they all survived 3 children (cases 36, 48, and 54) had a second intrathecal course because the C S F did not improve after the end of the first and the clinical condition had deteriorated concomitantly, they all died In case 24, after completion of intrathecal and 6 months' intramuscular streptomycin therapy the C S F remained abnormal After six weeks tubercle bacilli reappeared, and the patient was given another six months' intramuscular streptomycin and two six week intrathecal courses with apparent recovery The C S F in this child has now been normal for four months

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We are convinced that ventricular drainage is a life saving measure in acute hydrocephalus and should be resorted to wherever there are indications of a raised intracranial pressure But this measure is entirely symptomatic, and can have no effect upon the tuberculous process

TABLE III—FIFTY FOUR SEVERE CASES IN AMPHETAMINE SERIES DISTRIBUTED ACCORDING TO HIGHEST BLOOD PRESSURE COMPARED WITH AVERAGE DOSE OF AMPHETAMINE IN CORRESPONDING GROUPS FIGURES IN PARENTHESES SHOW SMALLEST AND LARGEST DOSES GIVEN IN RESPECTIVE GROUPS

Highest systolic blood pressure (mm Hg)	No of cases	Dose of amphetamine (mg) average min and max.
100–150	22	1026 (50–4000)
150–175	20	1906 (75–4850)
175–200	9	1343 (100–2825)
200–250	3	1762 (1350–2075)

Case 2 —A woman, aged 35, was admitted after having taken an unknown amount of some soporific at an unknown time She was deeply comatose and did not respond to pain She was cold and sweating with imperceptible pulse and unmeasurable blood pressure After treatment with amphetamine for twenty hours (total dose 1075 mg) she woke up and had no discomfort attributable to the therapy

As a curiosity it may be mentioned that a pregnant woman at full term, who was admitted with severe poisoning with allyl isopropyl barbituric acid, was delivered of a completely normal child during the treatment She did not wake up until four hours after the delivery. By that time she had been treated with amphetamine for thirty two hours (total dose 1525 mg) and owing to circulatory shock she had received a blood transfusion

Side effects (table II) were seen in 28% of the patients treated with amphetamine, but in all cases they were slight and only transitory Thus, vomiting occurred in only 7% of the severe cases as compared with 42% in the nikethamide series, and most of the patients vomited only once As is indicated in table II, side-effects were much less frequent than in the nikethamide series

In 13 patients electrocardiography was done after the treatment—in 9 within the first twenty-four hours after treatment had been discontinued. The electrocardiograms in 11 cases, including that of a patient who had received 4850 mg of amphetamine, were normal. One patient had low T_1 and T_2 and inverted T_3 waves, though the electrocardiogram had been normal two years previously This patient, aged 45, was a chronic addict to alcohol and had had delirium tremens twice during the past two years, and it is unlikely that the changes were due to the amphetamine The remaining patient was known to have heart disease with bundle-branch block, and the electrocardiogram was unchanged after the amphetamine treatment

The effect of amphetamine on the blood pressure is difficult to assess, because the blood pressure is also affected by several other factors in the treatment If, arbitrarily, it is assumed that rises of the systolic blood-pressure above 150 mm Hg are produced by amphetamine, more than half of the severe cases had a rise in the blood-pressure of this kind (table III) Table III also shows that there is no definite relation between the dose of amphetamine and the greatest height of blood-pressure reached

The blood-pressure remained high for one or two hours and then fell spontaneously to more moderate levels In no case was it thought necessary to withdraw amphetamine because of raised blood-pressure. In 2 cases amphetamine 100 mg per hour was given for three and twelve hours without any change in blood pressure In 1 of them extrasystoles and slight tremor were observed, but these symptoms subsided as soon as the dose was reduced to the usual 50 mg per hour, the other patient had no discomfort whatever from the treatment The patient with bundle branch block had for several years had a blood pressure of about 220/150 mm Hg He was aged 60, and in four hours he received 250 mg of amphetamine During the treatment the blood-pressure fell from 220/150 to 170/105

The figures for slight cases of poisoning do not allow any definite conclusions about changes of blood pressure, but they point in the same direction as those mentioned above

It thus seems that the effect of amphetamine on the blood pressure does not restrict its use in the treatment of acute barbiturate poisoning Pre existing hypertension is no contra indication

DISCUSSION

In the two series the age-distribution is uniform and the information obtained about the type and amounts of the hypnotics and the time of their ingestion does not differ materially In the amphetamine series only 44% of the intoxications were "severe" cases, compared with 70% in the nikethamide series, but, according to the definition, assessment of severity depends on the efficacy of the therapy, and it is highly probable that this difference between the two series is due to the pronounced "exciting" effect of amphetamine In the nikethamide series several patients who were awake became unconscious during the treatment, and according to the definition they were then placed under the heading "severe cases," whereas this happened in only 1 case among those treated with amphetamine

As previously stated, apart from the stimulant used the treatment was essentially the same in the two series The change from sulphonamides to penicillin cannot have altered the mortality, since none of the patients had massive or extensive pneumonia, and in only 1 case can bronchopneumonia (found at necropsy) be interpreted as the cause of death

Blood transfusion was given in 33% of the severe cases in the amphetamine series, compared with 16% in the nikethamide series The indications for transfusion were the same throughout the entire period The difference must therefore be taken as an expression of the greater efficacy of amphetamine therapy, because the frequency of the presence of these indications will increase with the time of survival of severely poisoned patients It has already been mentioned that the patients treated with nikethamide were more often in a more critical condition than those treated with amphetamine when the shock appeared In the nikethamide series all 7 patients who were given blood-transfusions died whereas in the amphetamine series 12 survived out of the 19 thus treated

In both series moderate deviations from normal of the serum chloride, serum bicarbonate, and blood-urea levels were seen in patients who were unconscious for long periods, but these deviations could be compensated by the daily administration of fluid without special measures being taken

The temperature was alike in the two series It was high in most severe cases and showed a tendency to increase with the duration of the coma Antipyretics were of no avail, whereas direct cooling was often of use in reducing the temperature

The neostigmine treatment cannot be said to have abolished the paralysing effect of the barbiturates on the intestines, but in several cases, even in deeply comatose patients, a rapid action of neostigmine was seen, as shown by rectal evacuation of carbon about an hour after the first injection of the drug The effect seems to have been best in the nikethamide series, presumably because amphetamine to some extent inhibits peristalsis

There seems to be no reason for questioning the uniformity and comparability of the two series, and the improved results obtained by the change from nikethamide to amphetamine—a decrease of the mortality figure from 44% to 9%—must therefore be considered significant

venesection was done If cyanosis was present, oxygen was given

During the first ten months, nikethamide was used as stimulant (Strömgren 1943) A 25% solution was used, 10 ml intravenously and 10–15 ml intramuscularly were given at once, and then 5–20 ml an hour was injected, according to the patient's response Sulphonamides were used prophylactically against pneumonia

During the following twenty-one months amphetamine was used as stimulant An intravenous injection of 20–50 mg (according to the estimated depth of the narcosis) was given at once, followed by 50 mg per hour, generally intramuscularly In a few very serious cases 100 mg per hour was given for short periods As a prophylactic measure against pneumonia penicillin, in a few cases combined with sulphonamide, was used

RESULTS

The material has been divided into slight and severe cases Severe cases comprise patients who were comatose on, or at some time after, admission The rest are grouped as slight The division into these two groups has been based exclusively on the objective condition of the patients, regardless of the sort and amount of hypnotic ingested and the time which had elapsed from the moment it had been taken and the time of the patient's admission

Nikethamide Series

For the first 61 patients (45 women and 16 men) nikethamide was used (table I) Of these 27 died, giving a mortality of 44% In "severe cases" the mortality was 63% All but 1 of the 27 died within forty nine hours of admission, 4 of them within the first six hours (Of these 4, 3 were moribund on admission) The remaining patient died seventy four hours after admission No patient survived who was unconscious for more than nine hours after admission

The *course* was highly variable One patient was awake on admission, but, in spite of vigorous stimulation, increasing somnolence and finally coma developed, and death followed thirty nine hours after admission In 9 cases the patient woke up after stimulation for some time and remained at least partially conscious for as long as thirty six hours, after which, despite continuous stimulation, became unconscious again and died In 7 cases circulatory shock developed, manifested by a weak, rapid pulse, pallor, cyanosis, decreasing blood-pressure, and increasing hæmoglobin percentage In most cases it did not develop until the patients were deeply comatose and their clinical condition very critical, in a few, however, it developed so rapidly that the patients succumbed before any anti shock treatment could be instituted All the patients who had shock died, even where blood transfusion was undertaken

Side effects of nikethamide were seen in 76% and were often very embarrassing (table II) Signs of irritation of motor nerve centres (tremor, quivering, muscular rigidity, and trismus), which occurred in 16 of the 43 severe cases, sometimes necessitated withdrawal or reduction of dosage, and this also proved necessary in 2 cases where convulsions developed Vomiting, which was found in 18 (42%) of the 43 unconscious patients, sometimes persisted for a long time and must be regarded as a very serious side effect, mainly because the danger of aspiration into the lungs is considerably increased, but also because carbon may be lost from the stomach, electrolytes and fluid are certainly lost Sneezing, which occurred in 24 of the severe cases, sometimes persisted incessantly for several days. Psychic excitation and motor unrest may be caused by the barbiturates alone and are not necessarily due to nikethamide

These poor results, which we were inclined to attribute, at least partially, to nikethamide, made us replace this drug by amphetamine

Amphetamine Series

For the subsequent 132 patients amphetamine was used instead of nikethamide (table I) Of these 12 died, giving a mortality of 9% In "severe" cases the mortality was 21% In 9 cases death took place within forty-nine hours of admission, of these patients, 2 were moribund on admission and died within six hours The remaining 3 deaths occurred sixty five, seventy, and a hundred and ten hours after admission

Of the surviving patients, 4 woke up after more than seventy two hours' unconsciousness, 1 of them after eighty-four hours 6 were unconscious for forty-eight to seventy two hours, 5 for twenty four to forty-eight hours, 15 for six to twenty four hours, and the remaining 28 for less than six hours

The *course* of the individual cases changed completely when we began to use amphetamine instead of nikethamide In contrast to what was seen with the nikethamide treatment, none of the patients who were conscious on admission became worse and died, and when coma subsided we could be confident that the patient was recovering Even the severe cases with protracted coma did not present so many threatening symptoms as did the cases in which nikethamide was used, and when serious complications, such as shock, supervened these could be successfully treated Fewer and less dangerous side effects occurred, and in no case was it necessary to interrupt the treatment because of side effects

TABLE I—DISTRIBUTION OF INTOXICATIONS ACCORDING TO POISONS INGESTED AND SEVERITY OF CASES (SEE TEXT ABOUT THE DIFFERENCE OF "SEVERE CASES IN THE TWO SERIES)

Poison	Nikethamide			Amphetamine		
	No of cases	Type of case		No of cases	Type of Case	
		Slight	Severe		Slight	Severe
Allyl isopropyl barbiturate	24 (40%)	4	20 (83%)	58 (44%)	29	29 (50%)
Phenyl-ethyl barbiturate	6 (10%)	3	3 (50%)	26 (20%)	17	9 (33%)
Other barbiturates	19 (30%)	6	13 (68%)	33 (25%)	17	16 (48%)
Unknown hypnotics	12 (20%)	5	7 (58%)	15 (11%)	11	4 (27%)
Total	61	18	43 (70%)	132	74	58 (44%)

TABLE II—SIDE EFFECTS

Side-effect	No of cases	
	Nikethamide	Amphetamine
Sneezing	26 (43%)	0
Vomiting	21 (34%)	15 (11%)
Cough	12 (20%)	0
Tremor rigidity	16 (26%)	3 (2%)
Convulsions	2 (3%)	0
Unrest, excitation	8 (13%)	6 (5%)
Headache	7 (11%)	10 (8%)
Dizziness	2 (3%)	4 (3%)
Confusion euphoria	0	6 (5%)
Hallucinations	0	2 (2%)
Extrasystoles	0	1 (1%)
Diplopia	0	2 (2%)
Total	41 (67%)	37 (28%)

Case 1 —A woman aged 34, was admitted four hours after having taken allyl isopropyl barbituric acid 5 g and diethyl barbituric acid 5 g in solution She was deeply comatose cyanotic and without reaction to pain tendon and corneal reflexes were absent After eighty four hours treatment with amphetamine (total dose 4850 mg) she woke up and had no discomfort attributable to the therapy Her highest blood pressure during treatment was 155/115 mm Hg

TABLE III—FIFTY FOUR SEVERE CASES IN AMPHETAMINE SERIES DISTRIBUTED ACCORDING TO HIGHEST BLOOD-PRESSURE, COMPARED WITH AVERAGE DOSE OF AMPHETAMINE IN CORRESPONDING GROUPS FIGURES IN PARENTHESES SHOW SMALLEST AND LARGEST DOSES GIVEN IN RESPECTIVE GROUPS

Highest systolic blood pressure (mm Hg)	No of cases	Dose of amphetamine (mg) average min and max.
100–150	22	1026 (50–4000)
150–175	20	1906 (75–4850)
175–200	9	1343 (100–2825)
200–250	3	1762 (1340–2075)

Case 2 —A woman, aged 35, was admitted after having taken an unknown amount of some soporific at an unknown time She was deeply comatose and did not respond to pain She was cold and sweating, with imperceptible pulse and unmeasurable blood pressure After treatment with amphetamine for twenty hours (total dose 1075 mg) she woke up and had no discomfort attributable to the therapy

As a curiosity it may be mentioned that a pregnant woman at full term, who was admitted with severe poisoning with allyl isopropyl barbituric acid, was delivered of a completely normal child during the treatment She did not wake up until four hours after the delivery By that time she had been treated with amphetamine for thirty two hours (total dose 1525 mg) and owing to circulatory shock she had received a blood transfusion

Side-effects (table II) were seen in 28% of the patients treated with amphetamine, but in all cases they were slight and only transitory Thus, vomiting occurred in only 7% of the severe cases as compared with 42% in the nikethamide series, and most of the patients vomited only once As is indicated in table II, side effects were much less frequent than in the nikethamide series

In 13 patients electrocardiography was done after the treatment—in 9 within the first twenty-four hours after treatment had been discontinued. The electrocardiograms in 11 cases, including that of a patient who had received 4850 mg of amphetamine, were normal One patient had low T_1 and T_2 and inverted T_3 waves, though the electrocardiogram had been normal two years previously This patient, aged 45, was a chronic addict to alcohol and had had delirium tremens twice during the past two years, and it is unlikely that the changes were due to the amphetamine The remaining patient was known to have heart disease with bundle branch block, and the electrocardiogram was unchanged after the amphetamine treatment

The effect of amphetamine on the blood pressure is difficult to assess, because the blood pressure is also affected by several other factors in the treatment If, arbitrarily, it is assumed that rises of the systolic blood-pressure above 150 mm Hg are produced by amphetamine, more than half of the severe cases had a rise in the blood pressure of this kind (table III) Table III also shows that there is no definite relation between the dose of amphetamine and the greatest height of blood pressure reached

The blood-pressure remained high for one or two hours and then fell spontaneously to more moderate levels In no case was it thought necessary to withdraw amphetamine because of raised blood pressure. In 2 cases amphetamine 100 mg per hour was given for three and twelve hours without any change in blood pressure In 1 of them extrasystoles and slight tremor were observed, but these symptoms subsided as soon as the dose was reduced to the usual 50 mg per hour, the other patient had no discomfort whatever from the treatment The patient with bundle branch block had for several years had a blood pressure of about 220/150 mm Hg He was aged 60, and in four hours he received 250 mg of amphetamine During the treatment the blood-pressure fell from 220/150 to 170/105

The figures for slight cases of poisoning do not allow any definite conclusions about changes of blood pressure, but they point in the same direction as those mentioned above

It thus seems that the effect of amphetamine on the blood pressure does not restrict its use in the treatment of acute barbiturate poisoning Pre existing hypertension is no contra indication

DISCUSSION

In the two series the age distribution is uniform and the information obtained about the type and amounts of the hypnotics and the time of their ingestion does not differ materially In the amphetamine series only 44% of the intoxications were "severe" cases, compared with 70% in the nikethamide series, but, according to the definition, assessment of severity depends on the efficacy of the therapy, and it is highly probable that this difference between the two series is due to the pronounced "exciting" effect of amphetamine In the nikethamide series several patients who were awake became unconscious during the treatment, and according to the definition they were then placed under the heading "severe cases," whereas this happened in only 1 case among those treated with amphetamine

As previously stated, apart from the stimulant used the treatment was essentially the same in the two series The change from sulphonamides to penicillin cannot have altered the mortality, since none of the patients had massive or extensive pneumonia, and in only 1 case can bronchopneumonia (found at necropsy) be interpreted as the cause of death

Blood transfusion was given in 33% of the severe cases in the amphetamine series, compared with 16% in the nikethamide series The indications for transfusion were the same throughout the entire period The difference must therefore be taken as an expression of the greater efficacy of amphetamine therapy, because the frequency of the presence of these indications will increase with the time of survival of severely poisoned patients It has already been mentioned that the patients treated with nikethamide were more often in a more critical condition than those treated with amphetamine when the shock appeared In the nikethamide series all 7 patients who were given blood-transfusions died, whereas in the amphetamine series 12 survived out of the 19 thus treated

In both series moderate deviations from normal of the serum chloride, serum bicarbonate, and blood urea levels were seen in patients who were unconscious for long periods, but these deviations could be compensated by the daily administration of fluid without special measures being taken

The temperature was alike in the two series It was high in most severe cases and showed a tendency to increase with the duration of the coma Antipyretics were of no avail, whereas direct cooling was often of use in reducing the temperature

The neostigmine treatment cannot be said to have abolished the paralysing effect of the barbiturates on the intestines, but in several cases, even in deeply comatose patients, a rapid action of neostigmine was seen, as shown by rectal evacuation of carbon about an hour after the first injection of the drug The effect seems to have been best in the nikethamide series, presumably because amphetamine to some extent inhibits peristalsis

There seems to be no reason for questioning the uniformity and comparability of the two series, and the improved results obtained by the change from nikethamide to amphetamine—a decrease of the mortality figure from 44% to 9%—must therefore be considered significant

The antagonism of amphetamine to the barbiturates has previously been described Alles (1933) showed that amphetamine sulphate had a considerable stimulating effect on animals in barbiturate anæsthesia Reifenstein and Davidoff (1938) showed that the depth and duration of 'Sodium amytal' narcosis in schizophrenics decreased considerably after the intravenous injection of amphetamine While the patients were under the influence of amphetamine the blood pressure was raised, and the pulse rate either remained unchanged or decreased a little On awakening, such patients might be somewhat euphoric or depressed and restless, might quiver a little, or complain of headache All these side effects were, however, only of short duration Myerson et al (1939) also used schizophrenics as experimental subjects With sodium amytal a deep reactionless sleep was induced, from this they could be awakened with amphetamine in ten to twenty minutes If amphetamine was given with the sodium amytal, or before it, the soporific action of the latter was abolished The patients invariably showed a slower pulse rate and a raised blood pressure while they were under the influence of amphetamine, but no relation could be demonstrated between the rise of blood pressure and the stimulating effect In experiments on animals Lumière and Meyer (1938) found that the stimulating effect of amphetamine was greater than that of strychnine, and Chakravarti (1939), who investigated the stimulating effect of amphetamine, leptazol, nikethamide, ephedrine, picrotoxin, and strychnine on animals, found that, in proportion to their toxicity, amphetamine had the most powerful effect, nikethamide the weakest, and leptazol one between these two extremes

The pharmacology of amphetamine was described in some detail by Myerson (1940)

Sympathomimetic Effects

(1) It dilates the pupils, widens the palpebral apertures, increases the intra ocular tension, and diminishes the power of accommodation

(2) It relaxes the non striated muscles of the gastro intestinal tract, weakens peristalsis, dilates the renal calyces and pelves and the bladder, and enlarges the kidneys

(3) It causes a rise of the blood pressure for one or two hours and tends to slow the pulse rate, but no cardiac changes can be demonstrated

(4) It reduces the secretion of saliva and sweat

Stimulation of Central Nervous System

Subcutaneous or intravenous amphetamine 20–30 mg counteracts the hypnotic action of the barbiturates

The only clinical study on amphetamine treatment of barbiturate poisoning was published by Freireich and Landsberg (1946) They treated 14 cases of moderate and severe barbiturate poisoning with amphetamine, and only 1 died

In the few patients of our amphetamine series who died in spite of the treatment, necropsy did not reveal any damage to organs which could be attributed to amphetamine, and in a careful study of the literature I have been unable to find any description of such damage On the other hand numerous reports have been published of cerebral damage following the administration of nikethamide and leptazol, the actions of which are similar because they may cause convulsions The cerebral changes are ganglion cell degeneration, small hemorrhages, and lymphocytic infiltrations Such changes have been described in man by Hassin (1939), Roback and Miller (1940), and Weil and Liebert (1940) Similar changes have been demonstrated in animals which had been given large doses of leptazol (Cleckley et al 1940, Finley and Brenner 1941, Liebert and Weil 1939, Nyberg 1938, Strecker et al 1939) even if the convulsions were prevented by other anæsthesia In barbiturate poisoning in man Smith and Wanscher (1942) found the same cerebral changes both after treatment with leptazol and with nikethamide, but the assessment of these findings is made difficult by the fact that barbiturates alone may produce similar changes (Hassin 1939)

On the whole the clinical results of the present study agree well with those of previous experiments

SUMMARY

61 patients with acute barbiturate poisoning were treated with nikethamide 2–5 g per hour, and 13 patients were treated with amphetamine, generally 50 mg per hour

Apart from this, the two series were treated similarly—i e, by aspiration of the stomach and instillation of medical carbon, stimulation of peristalsis with neostigmine, prophylactic treatment against pneumonia, the administration of parenteral fluid and anti shock treatment The two last mentioned therapeutic measures were taken when judged necessary according to certain examinations mentioned which were carried out at brief intervals

Of the 61 patients in the nikethamide series 27 (44%) died, the mortality for the 43 "severe" cases was 63% Of the 132 patients in the amphetamine series 12 (9%) died, the mortality for the 58 "severe" cases was 21% In the cases treated with amphetamine the course was less eventful, and the condition of the patients far better, than in those treated with nikethamide Untoward effects were fewer and of little practical importance This applies also to the rather common rise of blood pressure

Hence it must be said that in the treatment of acute barbiturate poisoning amphetamine is far more effective than nikethamide

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THE RATE OF RED-CELL EXCHANGE IN REPLACEMENT TRANSFUSIONS

N VEALL B Sc Lond, A Inst P
P L MOLLISON M D Camb, M R C P

From the M R C Radiotherapeutic Research Unit and Blood Transfusion Research Unit, Postgraduate Medical School of London

REPLACEMENT transfusion, as a form of treatment for hæmolytic disease of the newborn, has been widely practised during the past two or three years Broadly speaking, the object of this form of treatment is to remove as much as possible of the infant's blood and to replace it by Rh negative blood However, if this objective is analysed, it will be found that it make a great deal of difference whether it is whole blood or red cells only that are to be exchanged If it is whole blood an equally large exchange transfusion will have to be carried out whether or not the infant is anæmic, but if the object is to remove as great a proportion as possible of the infant's red cells it is evident that the more anæmic the infant is the smaller will the exchange transfusion need to be Similarly if another object of exchange transfusion is to supply the infant with a

certain bulk of Rh negative cells rather than with a certain volume of Rh negative-blood this objective will be more easily attained by transfusing a concentrated suspension of erythrocytes rather than whole blood

Mollison and Cutbush (1948) demonstrated that these considerations were of practical importance They published details of one case in which they had measured the rate of red cell exchange using a differential agglutination method After the exchange of some 240 ml of blood almost 90% of the red cells in the infant's circulation were Rh negative They pointed out that according to some published formulæ for exchange transfusion—e g, of Wiener and Wexler (1946)—this degree of "exchange" should have been achieved only after replacing some 500 ml of blood They also pointed out that the result was due to two separate factors the initial anæmia of the infant and the high red-cell count of the donor blood In another case they observed that, although at the end of an exchange transfusion some 90% of the cells were Rh negative the total red cell count was only about 3 000 000 per c mm Thus although a satisfactory exchange of red cells had been made, the infant soon had to be given another transfusion The last case illustrates well the shortcomings of describing the results of replacement transfusion in terms of "percentage exchange" It seems desirable to analyse more precisely the effects of replacement transfusion and to provide data from which the results in a given case can be predicted

THEORETICAL CONSIDERATIONS

Wallerstein (1946) cited the results of calculations on the efficiency of exchange transfusions for two individual cases Wiener and Wexler (1946) presented a more general formula, applicable in cases where the method of continuous transfusion and withdrawal was used Subsequently Wallerstein and Brodie (1948) made a detailed theoretical study of various methods of making exchange transfusions in which they considered both the continuous and intermittent techniques and, in addition, some variations of these methods

Experiments in vitro such as those reported by Wallerstein (1946) and Farquhar and Lewis (1949) are of little value, in that they only illustrate results already obtainable by mathematical calculations Such calculations as those of Wallerstein and Brodie (1948) have proved useful in assessing the comparative value of different techniques but do not provide a very good basis for quantitative predictions, if the object of the exchange transfusion is to exchange red cells rather than blood

The mathematical analyses and experiments in vitro of previous workers are only valid on the assumption that one homogeneous fluid is being replaced by a similar homogeneous fluid in a vessel of constant volume Even in the apparently simple case where the hæmatocrit of the donor s blood is the same as that of the infant's blood it is impossible to apply these simple formulæ to red-cell exchange without appreciable errors because the red cells are not uniformly distributed throughout the vascular system

To derive an expression applicable to the exchange of red cells it is necessary to introduce a quantity k, which is the value of the ratio of the "whole body hæmatocrit" of the infant to the venous-hæmatocrit This constant has a value of about 0 87 and does not depend on the level of venous hæmatocrit (Mollison et al 1950)

Only the method of "intermittent substitution with equal volume replacement" is considered here—i e withdrawal of v ml of blood from the infant, followed by injection of v ml. of blood into the infant &c Now in such a case, if the blood volume of the infant (assumed to be constant during the exchange transfusion) is V ml, v ml is removed and replaced at each operation, H_o is the initial venous hæmatocrit of the infant's blood D is the hæmatocrit of the donor's blood, and l is the constant referred to above, it can be shown that after n operations the fraction of the infant's original cells remaining is given by the formula

$$\frac{H_n^+}{H_o} = \left(l - \frac{v}{kV}\right)^n \qquad (1)$$

where H_n^+ is the venous hæmatocrit of Rh positive cells after n operations

The total venous hæmatocrit after n operations is given by

$$H_n = H_o\left(l - \frac{v}{kV}\right)^n - D\left(l - \left(l - \frac{v}{kV}\right)^n\right) \qquad (2)$$

The first term in equation 2 represents the residual Rh positive red cells and the second term the Rh-negative donor cells Consequently the ratio of infant's original red cells to total red cells is given by

$$F = \frac{H_o\,\alpha^n}{H_o\,\alpha^n + D(l - \alpha^n)} \quad \text{where } \alpha = \left(l - \frac{v}{kV}\right) \qquad (3)$$

It is a simple matter to modify equation 1 to make it applicable to various other techniques, but the case of "intermittent substitution with equal volume replacements" has been selected as being the most suitable for checking experimentally Moreover, this technique is widely used

METHODS

To test the assumptions made in deriving the above formula, studies were made of the efficiency of red cell exchange by studying the changes in concentration of red cells labelled with radioactive phosphorus (P^{32}) The donor blood used was freshly drawn and heparinised In one case the hæmatocrit of the donor blood was raised artificially by centrifuging the blood and then removing some of the supernatant plasma A small sample was taken from the donor bottle for the preparation of a radioactive cell suspension, and this was used for the determination of the infant's circulating red cell volume immediately before the beginning of the replacement transfusion At the same time the plasma volume was determined by Evans blue (T–1824) dye method A full description of these methods has been published elsewhere (Mollison et al 1950)

Throughout this paper, unless otherwise stated, "hæmatocrit" means the true proportion of red cells in unit volume of blood Following Barnes et al (1948) we take the true venous red cell hæmatocrit to be the

TABLE I—COMPARISON BETWEEN THE OBSERVED AND CALCULATED VALUES OF THE FINAL HÆMATOCRIT (H_n) IN THREE CASES

Case no	Original venous hæmatocrit* (H_o)	Red cell volume (ml)	Plasma volume (ml)	Blood volume (ml) (V)	Whole body hæmatocrit (H_c)	Hæmatocrit ratio (k)	α $\left(l - \frac{v}{kV}\right)$	No of operations (n)	α^n	Donor hæmatocrit* (D)	Final hæmatocrit calculated (H_n)	Final hæmatocrit observed (H_n)	Final blood volume (ml) (V_n)	Increase in blood volume (%)
1	43 3	87	138	250	34 9	0 805	0 900	15	0 206	56 1	53 3	49 6	286	14·0
2	41 0	65	110	185	35 2	0 859	0 874	13	0 160	65 3	60 [illegible]	59 5	218	12 [illegible]
3	37·0	71	129	204	34 8	0 941	0 896	18	0 139	42 8	41 9	38 7	238	16 5

* All hæmatocrit values have been corrected for trapped plasma [illegible]

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REPLACEMENT transfusion, as a form of treatment for hæmolytic disease of the newborn, has been widely practised during the past two or three years Broadly speaking, the object of this form of treatment is to remove as much as possible of the infant's blood and to replace it by Rh negative blood However, if this objective is analysed, it will be found that it makes a great deal of difference whether it is whole blood or red cells only that are to be exchanged If it is whole blood an equally large exchange transfusion will have to be carried out whether or not the infant is anæmic, but if the object is to remove as great a proportion as possible of the infant's red cells it is evident that the more anæmic the infant is the smaller will the exchange transfusion need to be Similarly if another object of exchange transfusion is to supply the infant with a

the observed figures, and it seems that the most likely cause of the discrepancy is the change in blood volume during exchange transfusion On the other hand, if the observed figures for total hematocrit and hæmatocrit of residual blood are corrected to allow for the observed increase in blood volume they exceed the expected values

Although the observed increases in blood volume were similar in the three cases, these estimates are subject to considerable error Each blood volume estimate entails the separate estimate of red cell volume and plasma volume, and the observed difference between two such estimates may carry an accumulated error On theoretical grounds blood volume is expected to increase to a small extent as venous hæmatocrit increases (Mollison et al 1950) This change in blood volume may be regarded as "permanent" The present estimates suggest that there may be in addition a temporary increase in blood volume after replacement transfusion Possibly, if the estimates of blood volume had been repeated at a longer interval after replacement transfusion, better agreement between the estimates would have been found However, even if the observed increase in blood volume is both significant and permanent, the theoretical predictions, based on the assumption that the blood volume remains constant, still agree with experimental observations to within a small percentage and are certainly adequate for practical applications

The fact that the blood flowing in the larger vessels contains a higher proportion of red cells than the average has an appreciable effect, as is shown by the difference between the solid and the interrupted lines in fig 1 This leads to a more rapid removal of the infant's red cells than would otherwise be the case, but, on the other hand, it also means that the removal of plasma is correspondingly less efficient Thus by similar reasoning to that used for the formulæ for red cells, the proportion of the infant's original plasma to total plasma (F_i) after n operations can be shown to be

$$F_i\,(\text{plasma}) = \frac{\left(l - H_o\right)\left(l - \frac{v}{xV}\right)^n}{\left(l - H_o\right)\left(l - \frac{v}{xV}\right)^n + \left(l - D\right)l - \left(l - \frac{v}{xV}\right)^n}$$

where the constant $x = \frac{l - W_o}{l - H_o}$, W_o being the initial whole body hæmatocrit This constant, unlike l, is greater than unity, hence the lower efficiency of plasma exchange compared with that of red cells

PRACTICAL APPLICATIONS

Before we consider the practical application of the formulæ given above, it is necessary to define the objective of the exchange transfusion in quantitative terms After a consideration of the therapeutic requirements and the practical limitations, Wallerstein and Brodie (1948) concluded that it was desirable to proceed with an exchange transfusion until 90% of the infant's blood had been exchanged However, they were considering the exchange only in terms of whole blood and, as we have shown, this is a different matter from considering the exchange of red cells alone Now it is generally accepted that the object of the exchange is to reduce the hematocrit of Rh positive cells to a low level while providing sufficient Rh negative cells to prevent anæmia Consequently it is suggested that for practical purposes the objectives of the exchange transfusion should be twofold

(1) the reduction of Rh positive cells to a level corresponding to a venous hæmatocrit of 5%,
(2) the addition of sufficient Rh negative cells to bring the total venous hæmatocrit up to not less than 50%

Stating Wallerstein and Brodie's criterion in this form makes it possible to take into account two important variable factors which would otherwise be neglected the hæmatocrit of the infant's original blood, and that of the donor blood

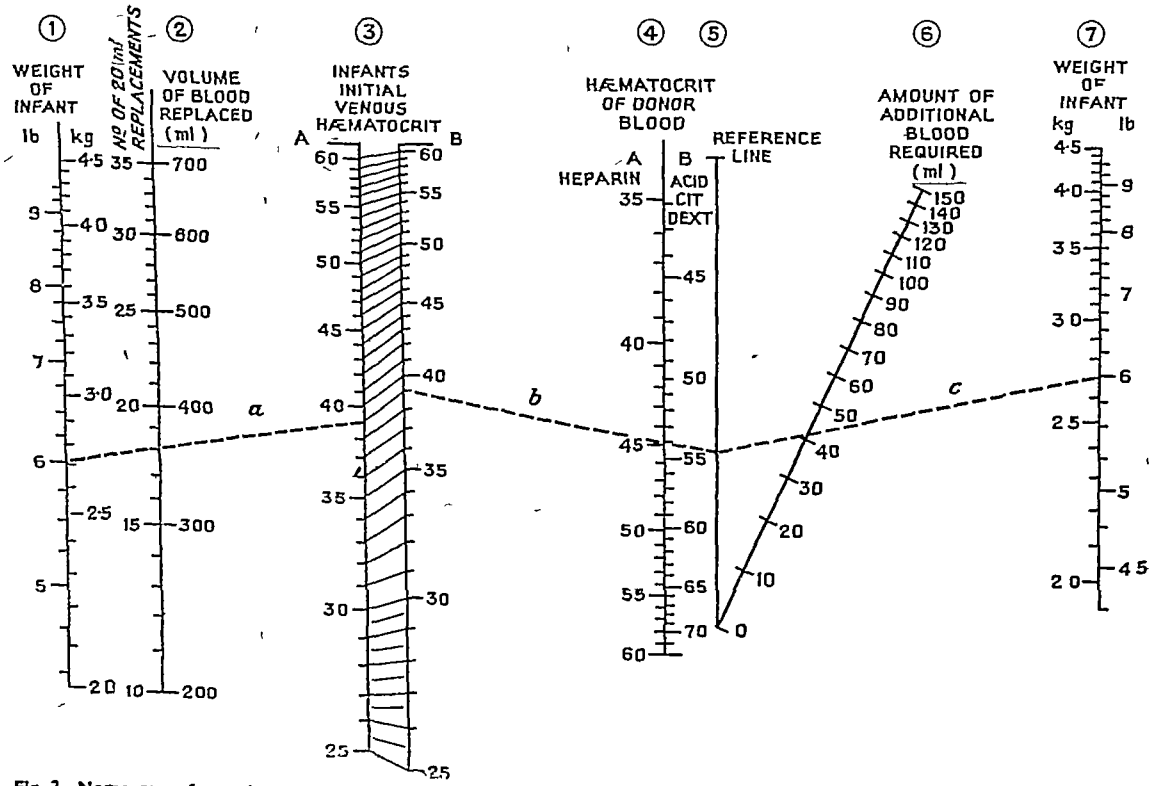

Fig 2—Nomograms for replacement transfusions to reduce the hæmatocrit of the infant's own red cells to 5% and to leave the infant with a final hæmatocrit of 50% Note that by using a concentrated red-cell suspension the injection of additional blood at the end of the exchange procedure is rendered unnecessary

observed venous red cell hæmatocrit \ 0 95, on the assumption that 5% of the column consists of trapped plasma The conditions of centrifugation are given in the paper referred to above

The replacement transfusion was made in accordance with the technique described by Mollison and Cutbush (1948), a 20 ml syringe being used Care was taken to prevent sedimentation in the bottle of donor blood and to measure as accurately as possible the volumes withdrawn and replaced Samples of the discarded blood were taken at known intervals and measured for radioactivity After an arbitrary number of operations the circulating red cell and plasma volumes were redetermined with further injections of radioactive red cells and Evans blue, the samples obtained being corrected for any residual radioactivity and dye left from the previous determinations

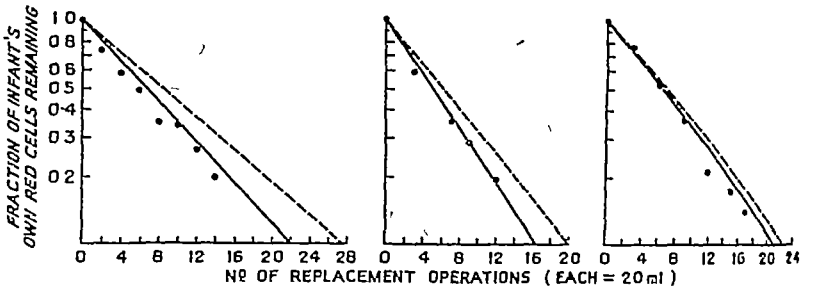

Fig 1—Relationship of number of replacement operations, each of 20 ml to fraction of infant s own red cells remaining in three cases solid lines show theoretical values calculated from equation 1 (see text) interrupted lines show theoretical values calculated from equation of Wallerstein and Brodie (1948) in which k is not taken into account and observed values based on radioactivity measurements are shown as plotting points

In two cases the proportion of infant's red cells remaining in the circulation was also deduced from estimations made by the technique of differential agglutination, as follows

The red cell count of the donor blood was estimated by counting about 2000 cells, mean corpuscular volume (M C V) was determined in the conventional manner from red cell count and venous hæmatocrit The infant's initial red cell count and M C V were determined in the same way from a venous blood sample The proportion of infant's red cells remaining in the blood after n operations was determined by subtracting estimates of donor red cell count from estimates of total red cell count, the number of donor cells being determined by the technique of differential agglutination. The proportion of infant's red cells in the blood after a given number of operations may be expressed either in terms of relative number of red cells or in terms of relative volume of red cells Since the red cells of a newborn infant are much larger than those of an adult, it makes a considerable difference whether one speaks of number or of volume To obtain figures which could be compared with the P^{32} measurements the counts of donor's red cells and of infant's red cells (obtained by subtracting the count of donor's red cells from the total red cell count) were multiplied by observed M C V to obtain their approximate proportion by volume

RESULTS

The results obtained in three cases studied are shown in table I The blood volume V is obtained by taking the sum of the measured red cell and plasma volumes and adding 2% to allow for the white cells The whole body hæmatocrit, W_o, is obtained by dividing the observed red cell volume by the blood volume V The factor k is derived from the whole body hæmatocrit and the initial venous hæmatocrit The number of complete operations—i e, 20 ml withdrawal followed by equal volume replacement—and the hæmatocrit of the donor blood are given in the table

It is thus possible to substitute numerical values for all the constants in equation 2, and to calculate the venous hæmatocrit after a given number of operations. Calculated values are given in the table and can be compared with the observed values given It will be seen that the observed values are all lower than expected. However, it will also be noted from the figures for the final blood volume and for the increase in blood volume that, although the theoretical expression was derived on the assumption that the total blood volume would remain constant, there was, in each case, an increase in blood volume, although no extra blood had been added.

By substituting numerical values in equation 1 it is possible to calculate the fraction of the infant's own red cells remaining at any stage *The solid line in fig 1* shows the theoretical values calculated from equation 1 The interrupted line is derived from the equivalent equation given by Wallerstein and Brodie (1948), which differs in that the constant k is not taken into account The experimental points are based on the radioactivity measurements Strictly speaking, the experimental points refer to the hæmatocrit of the infant's cells H_n^+ after n operations, and any change in blood volume necessitates a corresponding correction in these values if they are to reflect accurately the changes in the volume of Rh positive cells remaining

In table II some of the experimental readings shown in fig 1 have been used to calculate the hæmatocrit of Rh positive cells remaining after a given number of operations From this figure and the observed hæmatocrit, one obtains the ratio of the infant's cells to total red cells The corresponding calculated figure obtained by substituting numerical values in equation 3 is also shown It will be noted that there is very good agreement between the observed and the theoretical figures As an additional experimental check the values obtained by differential agglutination measurements (see above) are also given These values are obtained by difference —i e, total red cell volume *minus* total volume of donor cells—and are consequently subject to considerably greater error than the P^{32} measurements, which estimate the infant's red cell volume directly Moreover, estimates of red cell count have had to be converted into estimates of red cell volume for comparison with P^{32} measurements

TABLE II—COMPARISON BETWEEN THE OBSERVED AND CALCULATED VALUES OF THE FRACTION OF INFANT S RED CELLS REMAINING AFTER EXCHANGE TRANSFUSION THE VALUES ARE EXPRESSED FIRSTLY AS A FRACTION OF THE INITIAL RED CELL VOLUME AND SECONDLY AS A FRACTION OF THE FINAL RED CELL VOLUME

Case no	No of operations (n)	Proportion of infant s cells remaining		Observed hæmatocrit of infant s cells only (H_n^+)	Total hæmatocrit observed (H_n)	Ratio Infant s red cells / Total red cells		
		Theoretical	Observed			Observed (P^{32})	Observed (Ashby)	Calculated (equation 2)
1	14	0 227	0 195	8 4	48 1	0 17	0 22	0 162
2	12	0 187	0 193	7 9	57 6	0 14	—	0 130
3	3	0 157	0 137	27 0	38 5	0 70	0 61	0 693
3	9	0 375	0 354	13 3	38 3	0 35	0 33	0 332
3	17	0 720	0 731	5 8	38 7	0 15	0 09	0 136

DISCUSSION OF EXPERIMENTAL RESULTS

It has been shown that equation 3 predicts with a fair degree of accuracy the ratio of the infant's residual cells to total red cell volume at any stage of the exchange This figure, being a ratio, is not directly affected by changes in the total blood volume The calculated figures for the fraction of the infant's cells remaining and for the final hæmatocrit do not agree so well with

emoval of plasma, it would be necessary o leave 460 ml. to carry out a sufficiently arge exchange It would still be necessary o inject extra blood at the end of the xchange transfusion, since the hematocrit of the donor blood would have been ncreased to only about 40%

If it is necessary to use more than one bottle of stored blood, it will usually be ound most convenient to proceed as follows remove 200 ml or more of supernatant plasma from each of two bottles of stored blood, mix the remaining cell suspensions by pouring from one bottle to the other, and put about 500 ml of the mixture into one bottle and leave about 150 ml in the other The cell suspension should have a hæmatocrit of about 55%

For example, take the case of an infant weighing 9 lb (4 08 kg) with a hæmatocrit of 48% The nomo grams show that an exchange transfusion of 600 ml is required and that the use of donor blood with a hema tocrit of 53% (64% in acid citrate dextrose) would make unnecessary any "topping up" at the end of the exchange transfusion

RECOMMENDED PROCEDURE

In practice it usually is inconvenient to have to determine the hæmatocrit of the donor blood and of the infant before beginning the exchange transfusion The following routine is therefore suggested

It is assumed that the hæmoglobin-concentration of the cord blood sample will have been determined as a guide to treatment (Mollison and Cutbush 1949) Now, provided that the cord has been clamped as soon after birth as possible, it can be assumed that the hæmoglobin concentration of venous blood will be only slightly greater in samples taken from the infant after birth Thus if the infant s weight is known, a preliminary guess can be made of the size of exchange transfusion likely to be necessary The decision is next made whether to prepare a concentrated suspension of erythrocytes from one bottle of stored blood or from two In either case a mixed sample of the donor cell suspension is obtained a sample of blood is taken from the infant at the beginning of exchange transfusion and while the trans fusion is being given hæmatocrits of the donor s and infant s blood samples are determined Then after 30 minutes, and before the transfusion is completed the necessary information will be available and it will be possible by reference to the nomograms to decide how large the exchange transfusion must be and whether any topping up will be necessary at the end

If there are no facilities for determining the hæmatocrit, the scales provided in fig 3 can be used for the conversion of hæmoglobin values into their equivalent hæmatocrit values

It will be observed that, for a given hæmoglobin concentration, infants have slightly higher hæmatocrit values than have adults—i.e, the mean corpuscular hæmo globin concentration (M C H C) of infants is lower Although little emphasis has been laid on this difference in published reports, our own results, in normal and diseased newborn infants, show that the M C H C of newborn infants is about 32% compared with about 34% in adults This difference is taken into account in fig 3 On both hæmatocrit scales the values refer to observed red cell hæmatocrit The hæmoglobin scale is marked in g per 100 ml, but is also marked in percen tages for the convenience of those who use the "M R C Photometer," an instrument on which 100% is equivalent to 14 8 g per 100 ml

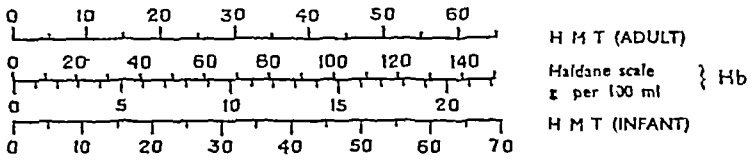

Fig 3—Conversion of hæmoglobin values into hæmatocrit values.

SUMMARY

Previously published formulæ for the efficiency of replacement transfusion have considered the exchange of whole blood The present paper is by contrast con cerned with the exchange of red cells It is shown that, to derive a reliable formula for this purpose it is necessary to take into account (1) the infant's initial hematocrit, (2) the hematocrit of the donor blood and (3) the unequal distribution of red cells and plasma in the vascular system

Relevant formulæ are presented whose validity has been established experimentally by the use of red cells labelled with P^{32}

The objectives of exchange transfusion in hæmolytic disease of the newborn have been redefined in the following terms (1) to reduce the hæmatocrit of Rh positive cells to 5%, and (2) to add sufficient Rh negative cells to bring the total venous hematocrit to 50%

Nomograms have been prepared from which the size of replacement transfusion required to achieve the above objectives in any given case can be rapidly deduced

We are grateful to Prof James Young for facilities for carrying out this work in the department of Obstetrics, Hammersmith Hospital and Prof A A Moncrieff (depart ment of Child Health) for permission to treat and to make observations on infants under his care

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A REVIEW OF 175 CONSECUTIVE PERSONAL CASES FROM ST PAUL S HOSPITAL, LONDON, AND ST JOHN S HOSPITAL LEWISHAM

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DURING the period in which these 175 cases of simple papilloma were under observation, 85 cases of carcinoma of the bladder were recognised de novo, and 31 of the 175 thought to be simple ultimately proved to be malig nant Thus we see in what a high proportion bladder growths are or become malignant—about 45% in this series Of the total of 260 cases only 55% continued to be simple The danger that a growth may become malignant should always occupy the surgeon's mind and impress him with the need for regular cystoscopy, particularly where the growth is solitary (tables I and II)

AGE, SEX, AND SITUATION

For practical purposes papilloma of the bladder does not occur at all before the age of about 30, the incidence increases as the years advance, to reach a maximum in the 6th and 7th decades (table III) This higher incidence among the elderly is not due to a continuation of the

With the aid of the formulæ given in equations 1 and 2 it is possible to decide in advance the steps required to achieve a satisfactory exchange of red cells as defined above, provided that the necessary numerical values can be substituted in the formulæ

It is certainly impracticable to determine the blood volume (V) for each case before starting the transfusion However, provided that the infant is not in cardiac failure, it seems to be sufficiently accurate for this purpose to assume a blood volume equivalent to 80 ml per kg of body weight (see Mollison et al 1950)

The volume of blood (v) replaced at each operation is assumed to be 20 ml in all cases

The value of k is taken as 0 87 for all cases, again on the basis of observations on normal and diseased infants made by Mollison et al (1950)

Thus for each individual case it is necessary to measure only the infant's hæmatocrit and body weight and the hæmatocrit of the donor blood In practice it would be inconvenient to have to make the necessary calculations arithmetically before starting the exchange, and to avoid this inconvenience nomograms (fig 2) have been prepared

Before describing the use of the nomograms, some of the principles which emerge from their use may be outlined When the infant is anæmic and small, the exchange of a relatively small amount of blood will reduce the hæmatocrit of Rh positive cells to 5% However, if only a small exchange transfusion is given, the concentration of Rh-negative cells in the infant's circulation will not have increased sufficiently by the end of transfusion, unless a very concentrated suspension of Rh negative cells has been used In such a case the concentration of Rh negative cells can be further increased by two methods—either by continuing the exchange transfusion, or by injecting Rh negative blood into the infant without further withdrawal, an operation conveniently described as "topping up"

USE OF NOMOGRAMS

The use of the nomograms is best illustrated by a concrete example

The infant's weight, in the present case 6 lb (2 72 kg), is marked on scale 1 in fig 2, and its hæmatocrit, in the present case 39%, on scale 3A For convenience the scales are marked for observed red cell hæmatocrit—i e, they are not corrected by the factor 0 95 The two marks are joined by a straight line (a in fig 2) whose point of intersection with scale 2 gives the number of exchange operations and volume of donor blood required to reduce the hæmatocrit of Rh positive cells to 5% Thus in the present case, 18 operations, involving the use of 360 ml of donor blood, are required

The uncorrected value of the infant's original hæmatocrit is next marked on scale 3B, and the uncorrected donor hæmatocrit on scale 4 Two scales for the hæmatocrit of the donor blood are marked on scale 4 scale A to be used when freshly drawn heparinised blood is used, and scale B to be used when the donor blood has been drawn into an acid citrate dextrose preservative solution Under the latter conditions the cells undergo immediate swelling but revert to their original size within 24 hours of transfusion The extent of this swelling varies considerably in different solutions and even between different blood samples taken into the same preservative solution The solution which is in general use in Britain at present has the following composition

2% disodium citrate (monohydric)	100 ml
15% dextrose	20 ml
to be mixed with 420 ml of blood	

For convenience, we refer to this solution as "acid citrate dextrose" We have found that, when blood is taken into this particular solution, the cells swell by 15% to 25% It has been considered sufficient for the present purpose to assume an average value of 20% This swelling is maximal within an hour of mixing the blood with the preservative solution and does not change appreciably during normal periods of storage To avoid the need for calculating the true hæmatocrit value of donor blood taken into acid citrate dextrose, the observed value is to be marked on scale 4B In the present example it is assumed that the donor's blood has been freshly drawn into a small amount of heparin saline, and the observed hæmatocrit, 45%, is therefore marked on scale 4A A straight line (b in fig 2) joining these two points is continued till it intersects the reference line (5) The point of intersection is next joined to the point on scale 7 corresponding to the infant's weight by a line (c in fig 2) which cuts the slanting scale 6 to give the volume of additional blood (about 40 ml in the present case) to be given at the end of the replacement transfusion to bring the hæmatocrit of Rh negative cells to 45%

If line b cuts the reference line 5 below the point 6 no extra blood will have to be injected into the infant at the end of the replacement transfusion Evidently, if donor blood with a hæmatocrit of, say, 60%—i e 72% in acid-citrate dextrose—were used as a routine it would very rarely be necessary to inject any additional blood On the other hand, if ordinary citrated blood, as supplied by blood supply depots, is used, it will always be necessary to inject additional blood at the end of the transfusion if the infant's hæmatocrit is to be raised to 50%, since citrated blood usually has a hæmatocrit of 32–36% (true) or 38–43% (observed)

From one point of view there is much to be said for using, as a routine, blood whose hæmatocrit has been raised to 60% (72% in acid citrate dextrose) by the removal of supernatant plasma This makes it unnecessary to inject additional blood at the end of the transfusion However, the preparation of a suspension of packed cells with a hæmatocrit of 60% is not always possible, for instance, the bottle of stored blood may not have settled adequately Moreover, even if it is possible to prepare a bottle with such a high hæmatocrit, it will reduce the volume of cell suspension available from a single bottle of blood to, say, 320 ml The exchange of such a small volume will often be insufficient to reduce the hæmatocrit of the infant's own cells to 5% In such cases it becomes of interest to know whether the use of, say, 400 ml of a cell suspension with a hæmatocrit of 45% could achieve the defined objects of replacement transfusion such a suspension could often be prepared from a single bottle of stored blood

In the present example it was shown that for an infant weighing 6 lb (2 72 kg) with an initial venous hæmatocrit of 39% the exchange of 360 ml of blood would suffice for the attainment of the first objective—i e, the reduction of the hæmatocrit of Rh positive cells to 5% The present example also shows that if the heparinised donor blood had a hæmatocrit of 45%, about 40 ml would have to be injected at the end of the exchange transfusion without withdrawing any further blood from the infant, if the infant's hæmatocrit was to be raised to 50% In this example therefore, the intelligent use of a single bottle of stored blood would suffice to achieve the objects of exchange transfusion

When the infant is of average size (7 lb, 3 18 kg) and has a hæmatocrit of about 47%, the use of a single bottle of stored blood will not achieve these two objectives The nomograms show that an exchange of 460 ml would be required to reduce the hæmatocrit of Rh positive cells to 5% Now, if the bottle of stored blood were used without being "concentrated," its hæmatocrit would be about 35% and the nomograms show that an extra 120 ml of blood would have to be injected after the completion of the exchange transfusion Alternatively, if the bottle of stored blood were concentrated by

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If there are no facilities for determining the hæmatocrit, the scales provided in fig 3 can be used for the conversion of hemoglobin values into their equivalent hematocrit values

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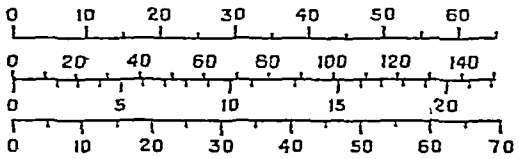

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The volume of blood (v) replaced at each operation is assumed to be 20 ml in all cases

The value of k is taken as 0 87 for all cases, again on the basis of observations on normal and diseased infants made by Mollison et al (1950)

Thus for each individual case it is necessary to measure only the infant's hæmatocrit and body weight and the hæmatocrit of the donor blood In practice it would be inconvenient to have to make the necessary calculations arithmetically before starting the exchange, and to avoid this inconvenience nomograms (fig 2) have been prepared

Before describing the use of the nomograms, some of the principles which emerge from their use may be outlined When the infant is anæmic and small, the exchange of a relatively small amount of blood will reduce the hæmatocrit of Rh positive cells to 5% However, if only a small exchange transfusion is given, the concentration of Rh negative cells in the infant's circulation will not have increased sufficiently by the end of transfusion, unless a very concentrated suspension of Rh negative cells has been used In such a case the concentration of Rh negative cells can be further increased by two methods—either by continuing the exchange transfusion, or by injecting Rh negative blood into the infant without further withdrawal, an operation conveniently described as "topping up"

USE OF NOMOGRAMS

The use of the nomograms is best illustrated by a concrete example

The infant's weight, in the present case 6 lb (2 72 kg), is marked on scale 1 in fig 2, and its hæmatocrit, in the present case 39%, on scale 3A For convenience the scales are marked for observed red cell hæmatocrit—i e, they are not corrected by the factor 0 95 The two marks are joined by a straight line (a in fig 2) whose point of intersection with scale 2 gives the number of exchange operations and volume of donor blood required to reduce the hæmatocrit of Rh positive cells to 5% Thus, in the present case, 18 operations, involving the use of 360 ml of donor blood, are required

The uncorrected value of the infant's original hæmatocrit is next marked on scale 3B, and the uncorrected donor hæmatocrit on scale 4 Two scales for the hæmatocrit of the donor blood are marked on scale 4 scale A to be used when freshly drawn heparinised blood is used, and scale B to be used when the donor blood has been drawn into an acid citrate dextrose preservative solution Under the latter conditions the cells undergo immediate swelling but revert to their original size within 24 hours of transfusion The extent of this swelling varies considerably in different solutions and even between different blood samples taken into the same preservative solution The solution which is in general use in Britain at present has the following composition

2% disodium citrate (monohydric)	100 ml
15% dextrose	20 ml
to be mixed with 420 ml of blood	

For convenience, we refer to this solution as "acid citrate dextrose" We have found that, when blood is taken into this particular solution, the cells swell by 15% to 25% It has been considered sufficient for the present purpose to assume an average value of 20% This swelling is maximal within an hour of mixing the blood with the preservative solution and does not change appreciably during normal periods of storage To avoid the need for calculating the true hæmatocrit value of donor blood taken into acid citrate dextrose, the observed value can be marked on scale 4B In the present example it is assumed that the donor's blood has been freshly drawn into a small amount of heparin saline, and the observed hæmatocrit, 45%, is therefore marked on scale 4A A straight line (b in fig 2) joining these two points is continued till it intersects the reference line (5) This point of intersection is next joined to the point on scale 7 corresponding to the infant's weight by a line (c in fig 2) which cuts the slanting scale 6 to give the volume of additional blood (about 40 ml in the present case) to be given at the end of the replacement transfusion to bring the hæmatocrit of Rh negative cells to 45%

If line b cuts the reference line 5 below the point 0 no extra blood will have to be injected into the infant at the end of the replacement transfusion Evidently, if donor blood with a hæmatocrit of, say, 60%—i e 72% in acid citrate dextrose—were used as a routine it would very rarely be necessary to inject any additional blood On the other hand, if ordinary citrated blood, as supplied by blood supply depots, is used, it will always be necessary to inject additional blood at the end of the transfusion if the infant's hæmatocrit is to be raised to 50%, since citrated blood usually has a hæmatocrit of 32–36% (true) or 38–43% (observed)

From one point of view there is much to be said for using, as a routine, blood whose hæmatocrit has been raised to 60% (72% in acid citrate dextrose) by the removal of supernatant plasma This makes it unnecessary to inject additional blood at the end of the transfusion However, the preparation of a suspension of packed cells with a hæmatocrit of 60% is not always possible, for instance, the bottle of stored blood may not have settled adequately Moreover, even if it is possible to prepare a bottle with such a high hæmatocrit, it will reduce the volume of cell suspension available from a single bottle of blood to, say, 320 ml The exchange of such a small volume will often be insufficient to reduce the hæmatocrit of the infant's own cells to 5% In such cases it becomes of interest to know whether the use of, say, 400 ml of a cell suspension with a hæmatocrit of 45% could achieve the defined objects of replacement transfusion, such a suspension could often be prepared from a single bottle of stored blood

In the present example it was shown that for an infant weighing 6 lb (2 72 kg) with an initial venous hæmatocrit of 39% the exchange of 360 ml of blood would suffice for the attainment of the first objective—i e, the reduction of the hæmatocrit of Rh positive cells to 5% The present example also shows that if the heparinised donor blood had a hæmatocrit of 45%, about 40 ml would have to be injected at the end of the exchange transfusion without withdrawing any further blood from the infant, if the infant's hæmatocrit was to be raised to 50% In this example, therefore, the intelligent use of a single bottle of stored blood would suffice to achieve the objects of exchange transfusion

When the infant is of average size (7 lb, 3 18 kg) and has a hæmatocrit of about 47%, the use of a single bottle of stored blood will not achieve these two objectives The nomograms show that an exchange of 460 ml would be required to reduce the hæmatocrit of Rh positive cells to 5% Now, if the bottle of stored blood were used without being "concentrated," its hæmatocrit would be about 35%, and the nomograms show that an extra 120 ml of blood would have to be injected after the completion of the exchange transfusion Alternatively, if the bottle of stored blood were concentrated by

Cystoscopy done too soon after treatment can cause misgivings as to the real state of affairs One should wait until all œdema resulting from the fulguration has fully settled An interval of four weeks, or sometimes more, is ordinarily required

TREATMENT

Fulguration through a cystoscope is the treatment of election for papillomata of the bladder It is inapplicable

1 When malignancy can be recognised
2 When malignancy is still in doubt after preliminary fulguration.
3 When for one reason or another it is impracticable

For routine destruction of papilloma per urethram an irrigating cystoscope is needed, and the more efficient the irrigating system the more quickly can the fulguration be carried out (One of us has his own instrument which has been specially constructed for the purpose) For the smaller growths up to a diameter of about $^3/_4$ in one treatment should suffice Much bigger growths can be completely destroyed by one treatment, but when the bladder is inspected again, a month or so later, a remnant of growth is often found, requiring further treatment Multiple moderate sized growths certainly require several applications As already stated, at least a month should elapse before the patient is cystoscoped again, to allow œdema and separating slough to disappear, and, where there is no tendency to quick reappearance of growth, three months is a more satisfactory interval between treatments

It can be very discouraging to find repeated crops of small sessile papilloma, but regular treatments seem in time often to reduce the rapidity of the appearance of further growths

Technique of Fulguration per Urethram —It is far more satisfactory to perform fulguration in hospital as a rule the patient need not be detained for more than two days A general anæsthetic is to be preferred, where the number of subsequent treatments is uncertain, spinal anæsthetics are not advisable

Using the coagulating current on the Genito Urinary Company's diathermy machine, 3 units is about the right strength, if one has it too strong the insulating material on the electrode will be damaged About every three minutes the electrode is changed and the instrument nurse cleans the metal tip with the edge of a discarded scalpel. A treatment should go on until the whole surface of the growth has been whitened by coagulation Occasionally poor vision from bleeding will terminate the proceedings

Postoperative Supervision —Every now and again, one observes a patient with pericystitis following cystoscopic fulguration This means that the bladder wall has been involved in the burning more than was anticipated Such a patient must be kept in bed under observation until all symptoms have subsided On the other hand tenderness may increase, redness or œdema may appear, and there may be constitutional signs of toxæmia This means that extravasation of urine has occurred, and a suprapubic incision is called for to drain the extravesical tissues Although it is not essential, it is generally wise to drain the bladder as well, by a small tube suprapubically An indwelling urethral catheter is not a good alternative, for the drainage may have to continue for a long time

Clot retention from continual bleeding has been known to occur after fulguration, necessitating evacuation of the clot either per urethram or—if the means of urethral evacuation are not available—by suprapubic incision

Open fulguration not only has a mortality not met with in fulguration per urethram, but obliges the patient to stay in hospital till the suprapubic wound heals

Total cystectomy is justifiable where small sessile papillomata reappear so often after treatment that they get out of control

Radium Implantation —Where cystoscopic appearances are those of malignant disease radium needles should be implanted through a suprapubic incision, or radon seeds used after which the bladder may be completely closed Operation mortality is negligible, the immediate prognosis is good, and the long term results with both techniques are very much better than those of total cystectomy

PROGNOSIS

One can never assure the patient with any certainty that vesical papillomata will not return The frequency with which they reappear in another part of the bladder shows that there is some factor in the bladder wall itself which encourages their recurrence

The growth with the best prognosis is the single villous tumour, which often does not reappear for years On the other hand it may return after a long period For example, one of us has seen a small villous papilloma in the bladder of a man aged 56 who had had a papilloma destroyed by cystoscopic diathermy by another surgeon twenty eight years before

The growth most likely to recur is the non villous papilloma which is multiple and sessile

THE FOLLOW UP

The above statements show how necessary it is to follow up all cases indefinitely, even though cystoscopy has shown them to be free of growth, particularly as we know that a quite large growth may be present in the bladder without causing symptoms The course of events taken by 17 cases in this series, all of whom missed cystoscopy for four years or more, is striking evidence of the need for the regularity of this examination, for in 11 (64%) of them the growth had reappeared In 10 of these there had been no symptoms at all

An excellent rule is that, having found a bladder quite free of growth three months after treatment, one should perform cystoscopy again six months later, nine months after that, and then every twelve months

As already mentioned, with repeated fulguration the tendency of papillomata to reappear may slow down in the course of years

One of us has a patient who has been under treatment for about eighteen years, and only once has her bladder been seen free of growth She refused—we think quite rightly—to have a total cystectomy At her present age of 66, there are still papillomata but she enjoys good health and there is no sign of malignancy in the true sense although the laboratory report on a section of the growth removed at the first operation eighteen years ago pronounced it to be malignant

A proliferative growth associated with ulceration, whether the latter be raised or excavated, means malignancy, and the patient is unlikely to live more than a year or two from the onset of the ulceration unless radium or radical treatment is carried out

SUMMARY

This paper reviews 175 cases of simple papilloma of the bladder, 31 of which proved to be malignant, or became so They form part of a series of 260 cases, in 45% of which malignancy was found

Cystoscopic fulguration is recommended for all cases of papilloma of the bladder which appear to be simple, and at first, in all doubtful cases as a diagnostic measure Implantation of radium or radon by the suprapubic route is successful in many malignant cases

After successful treatment by fulguration, papilloma of the bladder may return even after many years Regular cystoscopy is essential, so that reappearing growths may have prompt treatment

TABLE I—TIME OF ONSET OF MALIGNANT CHANGE

Malignancy found	Solitary tumours	Multiple tumours	Total
At first examination	73	12	85
Within ½ year	3	4	7
After ½–1 year	2	3	5
,, 1–2 years	1	3	4
,, 2–3 ,,	2	2	4
,, 3–4 ,,	1	1	2
After over 4 ,,	3	6	9
Total	85	31	116

These figures demonstrate that cases originally presenting as a frank carcinoma are commonly solitary

disease from early life, it commences with greater frequency as the years go by

Like stone in the urinary tract and renal neoplasms, papilloma is much commoner in the male than in the female, three to one according to table III

Although no part of the bladder is immune from the growth, it tends to appear at the base, in the early stages it is found an inch or so above the ureteric orifices on either the outer or the inner side The next common situation is at any point of the circumference round the internal urinary meatus And, as the advance of a long standing papilloma goes on, the intervening areas between these localities become the seat of further spread Hence it is not unusual to see vegetations involving any part of the area comprising the lower parts of the posterior and lateral walls, the trigone, and the internal urinary meatus The small multiple rapidly reappearing growths which are seen so soon after existing ones have been destroyed by diathermy are widespread in their distribution

CLINICOPATHOLOGICAL CLASSIFICATION

Because in most of these cases the growth is treated through a cystoscope, and it is almost impossible with this instrument to remove a mass of the growth which will include a portion of the adjacent bladder wall, biopsy specimens are unreliable and the cystoscopist must make his own diagnosis by inspection The following are the features which should guide him

Villous Papilloma
Pedunculated and long fronds
Single or multiple
No quick further new growth after fulguration

Sessile Papilloma
Invariably multiple
Quick small further growths after fulguration
It has short fronds and sometimes occurs with a villous papilloma

Doubtfully Malignant
Sessile papilloma with area of necrosis

Undoubtedly Malignant
A sessile papilloma associated with a bald tumour or with bald nodules in the vicinity
Ulceration of a sessile papilloma
Sessile papilloma with a firm base (as indicated by probing with diathermy electrode)

Though the majority of bladder growths are not malignant, and do not become so, malignant disease is all too often found after treatment, and a careful watch by cystoscopy must therefore be kept Of the 205 cases in which no malignancy could be recognised at the first examination, 61 (21%) ultimately showed definite signs of a malignant change

TABLE II—INCIDENCE OF MALIGNANCY RELATED TO MULTIPLICITY OF TUMOURS

Tumours	Total no of cases in group	No showing malignant change
Remaining solitary	129	72
Solitary becoming multiple	38	14
Apparently multiple from onset	83	30
Total	250	116

SYMPTOMS

All papillomata tend to bleed as they get large, because necrosis takes place as a result of a diminishing blood supply Hæmaturia is the almost constant sign with the outstanding feature that it is generally painless Of the 260 cases under review, there were only 10 (3 8%) without hæmaturia, and 5 of these were malignant, moreover, the hæmaturia of vesical carcinoma is not usually painless

When the urine is bloodstained and examined in two glasses, blood of vesical origin tends to be more concentrated in the second glass than the first This is in contrast with blood of renal origin which is equal in both glasses With blood of urethral or prostatic origin the first glass is darker than the second.

The higher concentration of blood in the second glass should not be confused with the terminal hæmaturia of cystitis, in which a few drops of blood are expressed at the end of micturition, and there is also increased frequency of micturition But markedly terminal hæmaturia is sometimes seen with a papilloma when the growth is situated near the internal meatus Persisting increased frequency of micturition usually means that malignancy has supervened, in which case dysuria is generally present as well

TABLE III—AGE INCIDENCE

Age	Male	Female
29	1	1
30–40	13	6
41–50	24	24
51–60	61	24
61–70	69	10
Over 70	27	
Total	195	65

The onset of hæmaturia has no fixed relation to the size of the growth Some growths attain a considerable size before the first bleeding, others are still quite small The determining factor is probably necrosis due to poor vascularity, and this may be expected sooner in a villous growth with long fronds than in a more compact vegetation Bleeding because of malignancy puts the case into another category

Some patients have increased frequency of micturition, and, as they often have residual urine too, there is the obvious suggestion that the papilloma is only part of the local pathology which has also led to bladder neck obstruction

DIAGNOSIS

Cystoscopy makes diagnosis a simple matter Difficulties arising from persistent bleeding can generally be overcome by irrigation throughout the examination If at the first examination, because of bleeding, the view is too poor for a definite opinion to be formed, a short period of indwelling catheter drainage (24–48 hours), with bladder irrigation several times daily if necessary, will usually make it easier to see the growth Where successful treatment per urethram can be hoped for, one should avoid opening the bladder to make a diagnosis.

After a good view has been obtained, the question of malignancy may still be undecided As a rule it can be answered, at a subsequent examination, carried out two weeks or more after vigorous treatment by fulguration

It is a mistake to assume that a growth is malignant because it is very large A papilloma may fill the whole bladder, and prevent a cystoscopic view, and on the suprapubic approach it may be so avascular that it can literally be raked out with the fingers without causing any troublesome bleeding

by sending identical twins with whooping cough to the hospital One of these children was used as a control and the other was given the 60 mg per kg dosage Fig 2 shows that the treated child's cough counts closely followed the curve of the children on 50 mg per kg until the last of the five days' observation, when it fell to 1–4 daily, though the cough was still hard and dry

Chloramphenicol

Chloramphenicol was also given in two forms (1) an emulsion in lemon syrup containing 250 mg of chloramphenicol per drachm was used for infants up to 1 year of age, and (2) capsules, each containing 250 mg, were given to children over the age of 4 years The treatment of children between the ages of 1 and 4 years is still a difficult problem, because of the extremely bitter taste of chloramphenicol and the objection of these children to swallowing capsules

Whichever preparation was chosen, the dosage was 100 mg per kg of body-weight once daily, at bedtime, for five days This routine was based on the observation that a single large dose of chloramphenicol almost completely sterilises the upper respiratory tract Since *H pertussis* is sensitive to chloramphenicol at relatively low concentrations, it seemed possible that such widely spaced doses would effectively control the disease, and the treatment would then be much simplified

The results in the 21 treated cases are compared with the controls in fig 3 It will be seen that the cough counts were greatly reduced by the chloramphenicol By the twenty third day of the disease the average count in the treated patients had reached the level that the controls attained on the forty second day In contrast with the children treated with aureomycin, those receiving chloramphenicol lost their whooping and vomiting and their cough became loose and productive

Comments

Two unconnected points are worth noting The first is the remarkable effect of aureomycin in the spersoid form on the children's appetite Whooping cough is notorious for producing vomiting and a disinclination to eat Yet by the fourth or fifth day of spersoid treatment, in spite of the persistence of vomiting after a paroxysm these children developed an almost pathological craving for food. So many mothers volunteered this information that notice had to be taken of it None of the controls and none of the patients treated with aureomycin capsules or with chloramphenicol gave a similar story

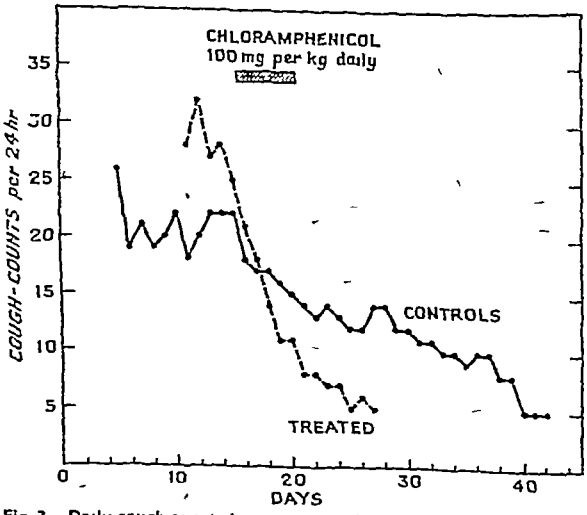

Fig 3—Daily cough-counts in same controls as in fig 1 compared with those of 21 patients treated with chloramphenicol 100 mg per kg of body weight for five days

The second point is the poor randomisation of cases which will be seen in the graphs Despite the attempt to balance the numbers of cases of about similar severity in the treated and untreated groups, there was in fact a preponderance of the most severe cases in the treated groups This maldistribution, which was not recognised until the data were analysed after completion of the tests, weighted the chances against the antibiotics and so added to the significance of any effects that they were shown to exert on the course of the disease

DISCUSSION

It may be objected that this trial was wholly dependent on the mothers' estimates of progress, that they are unreliable witnesses, and that a satisfactory assessment of antibiotic treatment in whooping cough can only be made on cases treated in hospital

Personal experience with information obtained from hospital sources has shown it to be of little value. The nurses, short handed and with a large number of ill children to look after, cannot be expected to produce accurate measurements of daily changes in so ephemeral a thing as a cough In the end, the information is usually based on impressions gained from the physicians, house officers, and nurses, whose observations vary widely in reliability and regularity In contrast, we have found the mothers conscientious and painfully accurate, because they have a vested interest in the children being treated and have but one patient to nurse

It has been suggested that a better index would be the effect of the antibiotic on complications such as atelectasis, eclampsia, &c Unfortunately, in whooping cough many of these tragedies are due to mechanical factors—plugging of bronchioles with mucus or of cerebral capillaries with lymphocytes—and an antibacterial substance cannot be expected to exert kinetic energy for the dislodgment of these blocks However, an effective treatment, if given in time, must be able to prevent such complications In the long run its efficacy in this respect can best be established by showing that it has produced a significant drop in the pertussis death rate in the Registrar General's returns The method used in this trial seems to be the most satisfactory one for rapidly assessing the value of aureomycin and chloramphenicol in pertussis

The results suggest that both aureomycin and chloramphenicol are effective in whooping cough The findings with chloramphenicol confirm the apparent cures obtained at the same hospital in the pilot trial (Gray 1950) during last year's epidemic In the U S A Bell et al (1949) treated 20 cases of pertussis with aureomycin and thought it shortened the disease, but striking results were only obtained when the drug was given in the early stages of the infection Before the results with the two antibiotics are compared, it should be pointed out that the correct dosage of either has not yet been found The impression gained from the present trial is that the amount of aureomycin given was too small, and that the clinical results might have been better with a dosage of 100 mg per kg daily in divided doses The dosage of chloramphenicol used last year now seems unnecessarily high whereas this year's seems not quite high enough A suitable intermediate dosage would be 100 mg per kg once a day (as in the trial) followed at eight hour intervals by two maintenance doses of 60 mg for infants of under a year, 125 mg for children of 1–3 years and 250 mg for those over 3 years

The difficulty of administration to children of 1–3 years is said to have been overcome in the case of aureomycin by giving it in a palatable chocolate powder

AUREOMYCIN AND CHLORAMPHENICOL IN WHOOPING-COUGH

J D GRAY
M D McGill
PATHOLOGIST, BELGRAVE HOSPITAL FOR CHILDREN, AND ROYAL EYE HOSPITAL, LONDON (KING'S COLLEGE HOSPITAL GROUP)

THE preliminary survey of the effects of chloramphenicol in whooping cough described in a previous paper (Gray 1950), did not lead to any definite conclusions because the cases were too few and an untried method was used for assessing results When this year's epidemic began the investigation was reopened and was extended to include a trial of 'Aureomycin' The same method as before was adopted for gauging the progress of the "treated" and controlled children The mother kept a written record of the number of paroxysms of all types that her child had in each 24 hours The children were treated as hospital outpatients but were seen daily except at weekends

No child was accepted for the trial unless three of the following four conditions were present (1) an absolute lymphocytosis, (2) a normal erythrocyte sedimentation rate, (3) a paroxysm observed during a visit to the hospital, and (4) isolation of *Hæmophilus pertussis* from a postnasal swab For the bacteriological test a new selective medium (Lacey 1951) was tried This returned 35% of the swabs as positive in the first month, 75% in the third month, and 84% in the final month, whereas parallel cultures on ordinary Bordet Gengou medium gave 50–55% positive plates The poor early results with the new medium were due to inexperience

On the day after the patients were first seen they were all started on four hourly doses of a chocolate milk sugar powder which was almost indistinguishable from one of the forms of aureomycin used Between the third and fifth days, when the diagnosis was fully established, the cases chosen for antibiotic treatment were changed to either aureomycin or chloramphenicol which was continued for five days, after which they returned to the placebo powder and continued with this until then discharge No child with a history of more than 20 days' illness was given antibiotic treatment The average daily cough counts in the control and treated groups were plotted on graphs, which also showed the average day of disease on which the patients were first seen and the average time elapsing between onset and the start of treatment

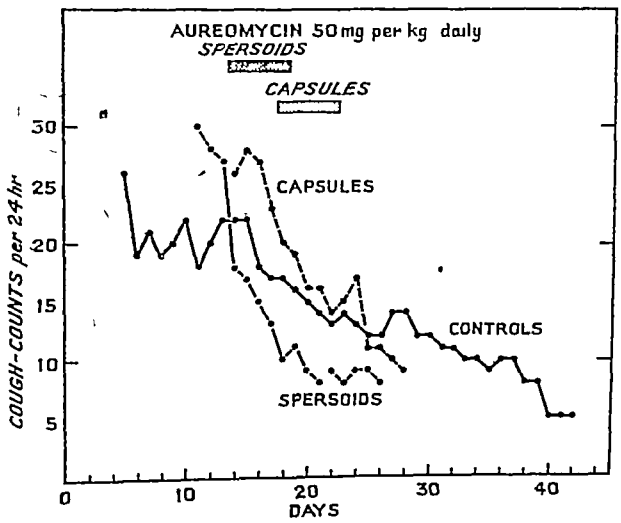

Fig 1.—Daily cough-counts in 82 untreated control cases compared with those in cases treated with aureomycin 50 mg per kg of body-weight daily for five days 28 receiving the drug in the form of spersoids and 10 in that of capsules

RESULTS

Controls

The control curve in fig 1 illustrates the normal course of the disease, without any specific treatment, in the 1950 epidemic The average cough count on the day before the placebo was started was 26, with the institution of what the mothers looked upon as treatment it dropped to 18–22 per twenty four hours, it stayed at this level for eleven days and then steadily declined to reach 5 coughs daily by the fortieth day of the disease In general the trend followed that of the 1949 epidemic

The graph suggests that giving the placebo powders had a slight psychological effect on the mothers, but this in no way invalidates the use of their cough-count as a yardstick for measuring the results of treatment

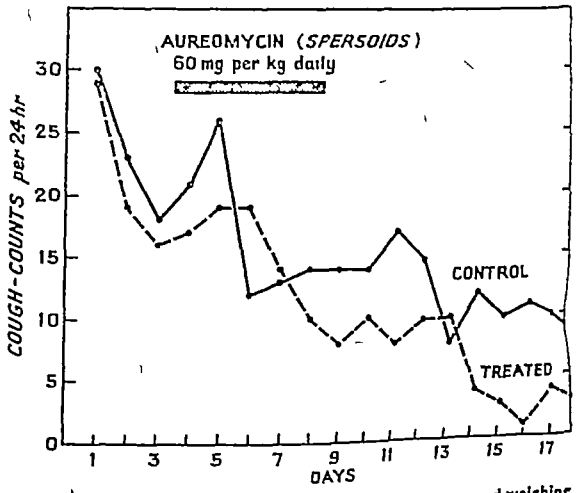

Fig 2.—Daily cough-counts in identical twins aged 3 years and weighing 16 kg each One twin was given aureomycin 60 mg per kg of body weight daily for five days while the other was an untreated control

Aureomycin

Two preparations of aureomycin were given (1) 'Spersoid,' in which the aureomycin was dispersed evenly in a chocolate sugar powder, so that 3 g (1 level teaspoonful) of the powder contained 50 mg of active aureomycin, and (2) the usual capsules, each containing either 50 or 250 mg Children up to 4 years were given spersoid Over that age they received either 50 or 250 mg capsules, depending on the child's ability to swallow The daily dosage for the 38 cases was 50 mg per kg of body weight divided into four hourly doses Treatment was continued for five days

Fig 1 shows the results with spersoid in 28 cases and with capsules in 10 cases It seems clear that aureomycin in the spersoid form definitely reduced the cough count thus by the twenty second day of disease the average count of the patients treated in this way had reached the level attained by the untreated cases on the thirty eighth day On the qualitative side, however, the cough remained hard, and vomiting and whooping still continued When the aureomycin was given in capsules the average cough counts were the same as in the controls until the final day of treatment when there was a fall suggesting that the treatment had some effect As in the children given spersoid the cough in this group remained hard and the vomiting and whooping were not checked

In a few cases the dosage of aureomycin in spersoid form was raised to 60 mg per kg daily for five days There were not enough patients in this group to be comparable with the series given 50 mg per kg daily However, fortune favoured this part of the inquiry

by sending identical twins with whooping cough to the hospital One of these children was used as a control and the other was given the 60 mg per kg dosage Fig 2 shows that the treated child's cough counts closely followed the curve of the children on 50 mg per kg until the last of the five days' observation, when it fell to 1–4 daily, though the cough was still hard and dry

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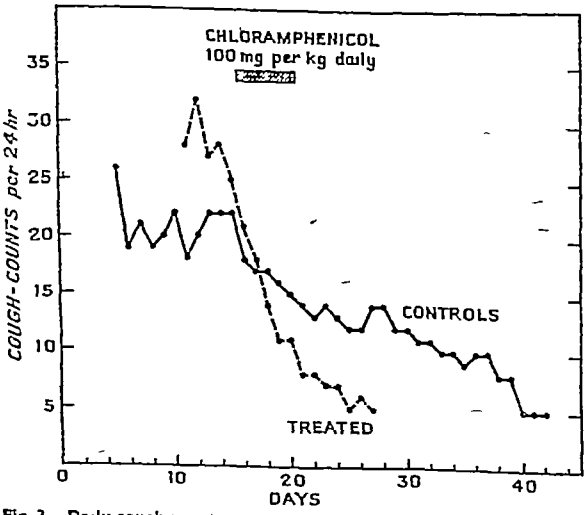

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AUREOMYCIN AND CHLORAMPHENICOL IN WHOOPING-COUGH

J D GRAY
M.D McGill
PATHOLOGIST, BELGRAVE HOSPITAL FOR CHILDREN, AND ROYAL EYE HOSPITAL, LONDON (KING'S COLLEGE HOSPITAL GROUP)

THE preliminary survey of the effects of chloramphenicol in whooping cough, described in a previous paper (Gray 1950), did not lead to any definite conclusions because the cases were too few and an untried method was used for assessing results When this year's epidemic began, the investigation was reopened and was extended to include a trial of 'Aureomycin' The same method as before was adopted for gauging the progress of the "treated" and controlled children The mother kept a written record of the number of paroxysms of all types that her child had in each 24 hours The children were treated as hospital outpatients but were seen daily except at weekends

No child was accepted for the trial unless three of the following four conditions were present (1) an absolute lymphocytosis, (2) a normal erythrocyte sedimentation rate, (3) a paroxysm observed during a visit to the hospital, and (4) isolation of *Hæmophilus pertussis* from a postnasal swab For the bacteriological test a new selective medium (Lacey 1951) was tried This returned 35% of the swabs as positive in the first month, 75% in the third month, and 84% in the final month, whereas parallel cultures on ordinary Bordet Gengou medium gave 50–55% positive plates The poor early results with the new medium were due to inexperience

On the day after the patients were first seen they were all started on four hourly doses of a chocolate milk sugar powder which was almost indistinguishable from one of the forms of aureomycin used Between the third and fifth days, when the diagnosis was fully established, the cases chosen for antibiotic treatment were changed to either aureomycin or chloramphenicol which was continued for five days, after which they returned to the placebo powder and continued with this until their discharge No child with a history of more than 20 days' illness was given antibiotic treatment The average daily cough counts in the control and treated groups were plotted on graphs, which also showed the average day of disease on which the patients were first seen and the average time elapsing between onset and the start of treatment

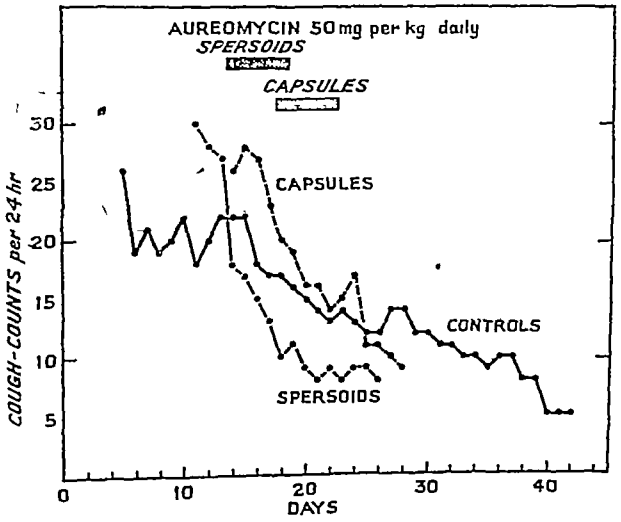

Fig 1.—Daily cough-counts in 82 untreated control cases compared with those in cases treated with aureomycin 50 mg per kg of body-weight daily for five days 28 receiving the drug in the form of spersoids and 10 in that of capsules

RESULTS

Controls

The control curve in fig 1 illustrates the normal course of the disease, without any specific treatment, in the 1950 epidemic The average cough-count on the day before the placebo was started was 26, with the institution of what the mothers looked upon as treatment it dropped to 18–22 per twenty four hours, it stayed at this level for eleven days and then steadily declined to reach 5 coughs daily by the fortieth day of the disease In general the trend followed that of the 1949 epidemic

The graph suggests that giving the placebo powders had a slight psychological effect on the mothers, but this in no way invalidates the use of their cough-counts as a yardstick for measuring the results of treatment

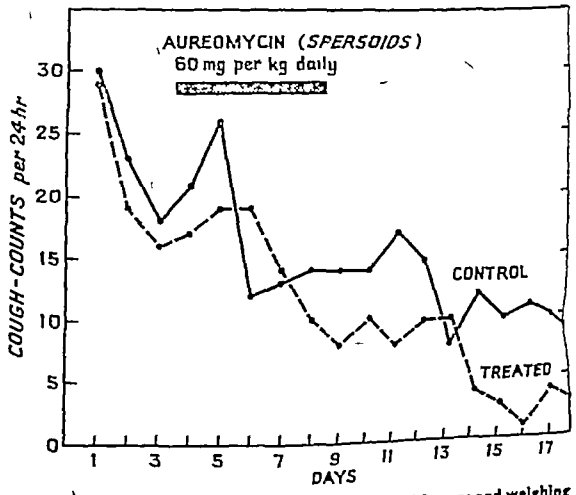

Fig 2.—Daily cough counts in identical twins aged 3 years and weighing 16 kg each One twin was given aureomycin 60 mg per kg of body-weight daily for five days while the other was an untreated control

Aureomycin

Two preparations of aureomycin were given (1) 'Spersoid,' in which the aureomycin was dispersed evenly in a chocolate sugar powder, so that 3 g (1 level teaspoonful) of the powder contained 50 mg of active aureomycin, and (2) the usual capsules, each containing either 50 or 250 mg Children up to 4 years were given spersoid Over that age they received either 50 or 250 mg capsules, depending on the child's ability to swallow The daily dosage for the 38 cases was 50 mg per kg of body weight divided into four hourly doses Treatment was continued for five days

Fig 1 shows the results with spersoid in 28 cases and with capsules in 10 cases It seems clear that aureomycin in the spersoid form definitely reduced the cough count thus by the twenty second day of disease the average count of the patients treated in this way had reached the level attained by the untreated cases on the thirty eighth day On the qualitative side, however, the cough remained hard, and vomiting and whooping still continued When the aureomycin was given in capsules the average cough counts were the same as in the controls until the final day of treatment when there was a fall, suggesting that the treatment had some effect As in the children given spersoid, the cough in this group remained hard and the vomiting and whooping were not checked

In a few cases the dosage of aureomycin in spersoid form was raised to 60 mg per kg daily for five days There were not enough patients in this group to be comparable with the series given 50 mg per kg daily However, fortune favoured this part of the inquiry

by sending identical twins with whooping cough to the hospital One of these children was used as a control and the other was given the 60 mg per kg dosage Fig 2 shows that the treated child's cough counts closely followed the curve of the children on 50 mg per kg until the last of the five days' observation, when it fell to 1–4 daily, though the cough was still hard and dry

Chloramphenicol

Chloramphenicol was also given in two forms (1) an emulsion in lemon syrup containing 250 mg of chloramphenicol per drachm was used for infants up to 1 year of age, and (2) capsules, each containing 250 mg, were given to children over the age of 4 years The treatment of children between the ages of 1 and 4 years is still a difficult problem because of the extremely bitter taste of chloramphenicol and the objection of these children to swallowing capsules

Whichever preparation was chosen, the dosage was 100 mg per kg of body weight once daily, at bedtime, for five days This routine was based on the observation that a single large dose of chloramphenicol almost completely sterilises the upper respiratory tract Since *H pertussis* is sensitive to chloramphenicol at relatively low concentrations, it seemed possible that such widely spaced doses would effectively control the disease, and the treatment would then be much simplified

The results in the 21 treated cases are compared with the controls in fig 3 It will be seen that the cough counts were greatly reduced by the chloramphenicol By the twenty-third day of the disease the average count in the treated patients had reached the level that the controls attained on the forty second day In contrast with the children treated with aureomycin, those receiving chloramphenicol lost their whooping and vomiting and their cough became loose and productive

Comments

Two unconnected points are worth noting The first is the remarkable effect of aureomycin in the spersoid form on the children's appetite Whooping cough is notorious for producing vomiting and a disinclination to eat Yet by the fourth or fifth day of spersoid treatment, in spite of the persistence of vomiting after a paroxysm these children developed an almost pathological craving for food So many mothers volunteered this information that notice had to be taken of it None of the controls and none of the patients treated with aureomycin capsules or with chloramphenicol gave a similar story

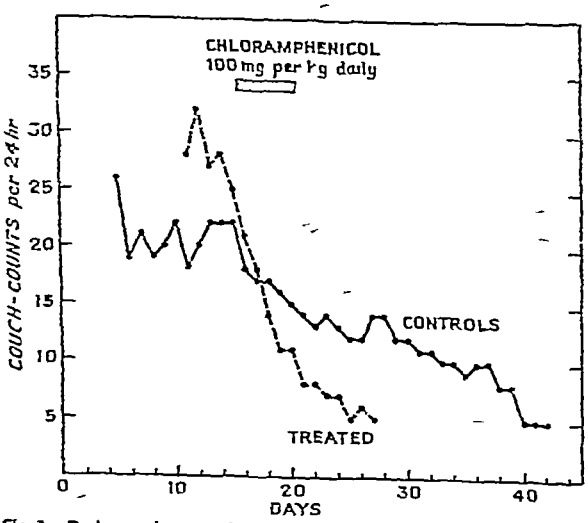

Fig 3.—Daily cough-counts in same controls as in fig 1 compared with those of 21 patients treated with chloramphenicol 100 mg per kg of body weight for five days

The second point is the poor randomisation of cases which will be seen in the graphs Despite the attempt to balance the numbers of cases of about similar severity in the treated and untreated groups, there was in fact a preponderance of the most severe cases in the treated groups This maldistribution, which was not recognised until the data were analysed after completion of the tests, weighted the chances against the antibiotics and so added to the significance of any effects that they were shown to exert on the course of the disease

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vehicle But in my view this powder's content of aureomycin—50 mg in each teaspoonful—is too small Thus, a child weighing 15 kg, who is ordered a daily dosage of 50 mg of aureomycin per kg of body weight, will have to take fifteen teaspoonfuls of the chocolate powder every day—enough to lead most children to rebel after three or four days If the present aureomycin content was doubled, or better still trebled, the powder should be satisfactory The taste of chloramphenicol is harder to disguise, and so far no vehicle has been discovered which will wholly cover it up But the experienced nurse or mother can usually get the doses taken without much trouble

The association of a voracious appetite with aureomycin dosage is only seen when the antibiotic is given in a dispersed form, it was not reported in any case receiving aureomycin in gelatin capsules, which may be digested in the duodenum Aureomycin in spersoid, however, comes in close contact with the gastric mucosa, and the effect on appetite may depend on this fact The observation recalls the so called growth factor described as intimately related to aureomycin Is it possible that the increased growth noted in animals when this factor is added to their feeds is simply the result of a greatly enhanced appetite ?

SUMMARY

A controlled trial of aureomycin and chloramphenicol in the outpatient treatment of children with whooping cough has shown that both antibiotics are effective in reducing the cough count, but chloramphenicol also lessens the whooping and vomiting and loosens the cough

Children receiving aureomycin in powder form develop a voracious appetite

I am indebted to Dr W H Bradley for his continued interest, to Mr J A. Rouse for much help, and to the Lederle Laboratories Division, Cyanamid Products Ltd, for the supply of aureomycin used in this trial

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TREATMENT OF TYPHOID FEVER WITH CHLORAMPHENICOL

C F L HILL
M R C S, D P H
PHYSICIAN

J V ARMSTRONG
M.D Lond, D P H
PHYSICIAN SUPERINTENDENT

BROOK GENERAL HOSPITAL, LONDON

C KNIGHT MCDONALD
M D Edin D P H
PATHOLOGIST

E N ALLOTT
M.A., B.M Oxfd, F R C P
GROUP PATHOLOGIST

GROUP LABORATORY, LEWISHAM HOSPITAL, LONDON

WHEN the s s *Moolian* docked in London on Dec 15, 1949, with a total complement of 1012 crew and passengers, 3 members of the crew were removed to hospital with typhoid fever Ultimately 67 typhoid excretors, 10 of whom seemed to be carriers, were found, and 21 of these were admitted to the Brook Hospital The first was admitted on Dec 16, the twelfth day of his illness, his symptoms having appeared between Port Said and Marseilles Later, patients were admitted at various periods, some of them as early as the third day of illness Of the 21 patients, 8 were British and 13 Asiatic

CONDITION ON ADMISSION

The cases were of typical typhoid fever with toxæmia, the majority experiencing headache, cough, and abdominal discomfort In most of the second week cases there was tenderness under the left costal margin though the spleen was not palpable Some diarrhœa was experienced by most of the patients Of these cases 6 were graded as mild, 7 as moderately severe, and 8 as severe

DETAILS OF CASES

Case no	Age (yr)	Nationality*	Clinical severity	Day of disease on which treatment was started	Total duration of treatment (days)	Total dosage (g)	Day of disease on which relapse occurred	Days between end of 1st treatment and onset of relapse
			Cases which relapsed					
1	28	B	Severe	15	10	26 5	37	19
2	25	I	Severe	10	26†	62 5	55	15
3	55	I	Mild	12	9	23	34	13
4	19	B	Mild	10	9	22 75	29	10
6	22	B	Severe	12	10	26 5	38	16
7	28	B	Moderate	11	14	44 5	36	11
8	25	B	Moderate	8	2	22	41	30
12	43	G	Severe	7	13	35	37	19
15	34	I	Moderate	6	2	20	19	11
16	21	B	Mild	5	2	20	21	14
18	50	G	Severe	13	17	49 5	48	14
20	17	B	Mild	6	2	20	34	26
Mean	—	—	—	9 6	9 7	31 2	35 3	15 3
			Cases without Relapse					
5	22	B	Moderate	12	9	23 25	—	—
9	46	G	Mild	6	2	20	—	—
10	40	G	Severe	11	10 5	42	—	—
11	50	G	Moderate	16	12 5	43 5	—	—
13	43	G	Moderate	9	9	20	—	—
14	33	I	Mild	4	2	20	—	—
17	55	G	Moderate	8	15	33 5	—	—
19	53	I	Severe	8	14	32	—	—
21	42	I	Severe	6	18	32	—	—
Mean	—	—	—	8 9	10 2	29 6	—	—

* B British, I Indian G Goanese
† Case of cystitis two courses of ten and sixteen days

PROGRESS

There were no deaths, and complications were very few Convalescence was generally rapid and uneventful There was no evidence of any vascular thrombosis there were no cases of hæmorrhage or perforation One patient developed deeply eroded lingual and scrotal ulcers, which persisted for three or four weeks before healing, serological tests for syphilis were negative Another patient developed cystitis due to *Salmonella typhi* shortly after the first course of treatment, which led to two relapses and needed altogether three courses of chloramphenicol, the last course apparently finally cured the illness, and the urine and fæces became free from typhoid bacilli

TREATMENT

Treatment with chloramphenicol was started as soon as possible after admission, at times varying between the fourth and sixteenth day of disease Two types of therapy were used The first 6 patients were treated by a standard Woodward Smadel régime—i e, 4 g as a loading dose followed by 3 g daily until twenty four hours after disappearance of fever, and 1 5 g daily for five days afterwards The duration of treatment in each case is shown in the accompanying table After the first 6 patients had been admitted and treatment started, it was thought possible, after discussion with Dr W H Bradley, that a more intensive course for a shorter time might be effective, and it was decided that short intensive treatment, consisting of 4 g as a loading dose followed by 2 g six hourly up to a total of 20 g in forty eight hours, should be given to what were considered the less severely ill patients, and the more orthodox régime given to the more severely ill The selection of cases for the two series was therefore not purely random Of the 10 patients who were intended to have only the short course of treatment 4 showed well marked symptomatic improvement at the end of the

first forty eight hours, but seemed not to be maintaining their improvement in the next forty eight hours, so treatment was continued on the general lines of the Woodward Smadel régime

The material therefore consists of 6 patients who had an intensive course for forty-eight hours only and 15 patients who had varying periods of treatment, from nine days upwards The total dosage of chloramphenicol was 20–35 g

RESPONSE TO TREATMENT

Our results were similar to those already recorded by Smadel et al (1949), Woodward et al (1950), and others There was a conspicuous general improvement both subjective and objective, in forty eight hours, and defervescence usually took place within four days One patient, who required a heavy dose of 35 g in thirteen days, was not completely afebrile until the seventh day of treatment, and another patient developed a cystitis and recrudescence of pyrexia while still receiving chloramphenicol

TOXIC EFFECTS

No toxic effects were observed except internal ophthalmoplegia, which led to difficulty in vision and was reported in 4 of 10 patients who received the heavy dose of 20 g in forty eight hours This incidence may be lower than the true figure, since many of the patients did not read and did not report minor symptoms owing to linguistic difficulties The ophthalmoplegia was purely temporary and only lasted during the period of heavy dosage Gray (1950) noted visual effects of chloramphenicol in the clinical treatment of pertussis and in normal volunteers, symptoms appeared to occur at a blood-chloramphenicol level of about 50 µg per ml Ralston and Payne (1950) also noted eye symptoms during the treatment of brucellosis with chloramphenicol Nausea and vomiting were conspicuously absent

RELAPSES

As in all previous series treated with chloramphenicol, the relapse rate was very much higher than in any earlier typhoid series, it amounted to 12 out of our 21 (57%) A second relapse was noted only in 1 case—the patient with cystitis Most of the relapses were severe, being characterised by a rapidly attained pyrexia up to 103°–104°F and by recrudescence of the toxæmia, malaise, &c, of the main attack The recurrence of a bacteræmia was confirmed by blood culture in all relapses except one The one exception was clinically typical and at the time when relapse might have been expected, but repeated

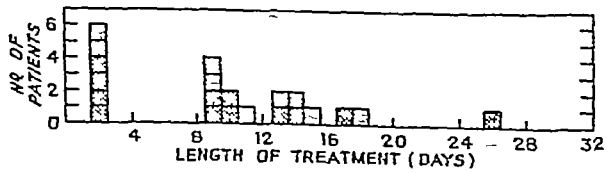

Fig. 1—Lack of correlation between relapse and length of treatment with chloramphenicol: hatched columns patients who did not relapse.

blood cultures were negative This relapse and one other, which was not severe, did not receive specific treatment, and recovery took place in five and six days respectively All the other relapses were severe and were treated with relatively long courses of chloramphenicol, to which they responded as the initial-attack had done All the cases of this series are summarised in the table, those which relapsed being separated from those which did not

Relation of Relapse to Length of Treatment—Of the 6 cases treated for only forty eight hours 4 relapsed, whereas of the 15 treated for nine days or more, 8 relapsed The difference in relapse rates of these two groups is not

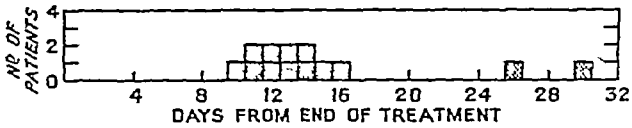

Fig 2—Time relation of relapses to end of treatment stippled columns patients treated for nine days or more hatched columns patients treated for only forty eight hours

statistically significant Fig 1 shows the distribution of relapses against the length of initial treatment The suggestion of Smadel et al (1949) that relapse is inversely related to the length of treatment, and their report that no relapse occurred among patients treated for longer than eight days, is not confirmed by our findings In our series there seemed to be no correlation whatsoever

Time of Relapse in Relation to Previous Treatment—Fig 2 shows the date of onset of the relapses in relation to the cessation of previous treatment Except for 2 cases, the relapses all occurred between ten and sixteen days after the cessation of therapy—which is approximately the normal incubation period of typhoid fever The day of relapse seemed to have no relation to the period which had elapsed from the beginning of the illness

BACTERIOLOGY

The organism concerned in this outbreak was grouped by Dr A. Felix, F R S, as belonging to phage type A It was inactivated in vitro by a concentration of chloramphenicol 3 µg per ml In accordance with previous experience of Woodward et al (1950) this sensitivity was maintained in organisms isolated from the blood urine, and fæces, whether from the original illness, convalescence, or relapse There was no evidence of development resistance to chloramphenicol

Blood culture was used to isolate typhoid bacilli from all the patients, but serial cultures following diagnosis were not carried out except to confirm relapses suspected clinically Fæcal and urinary cultures were carried out regularly

Although the organisms disappeared from the blood very rapidly after the administration of chloramphenicol, the effect on fæcal cultures and urinary cultures was far from consistent On the whole, the organism tended to disappear from the fæces during the periods of high dosage but this was by no means constant and some patients continued to excrete typhoid bacilli even in the presence of very high blood levels of the drug The onset of clinical relapse and positive blood culture was not always associated with a return of bacilli to the fæces if these had been absent previously Woodward et al (1950) found relapses in 4 out of 5 patients who continued to excrete typhoid bacilli under treatment

BLOOD LEVELS

Blood chloramphenicol levels were consistently estimated in the present series The method used was inactivation of *Bact pneumoniæ* K3 as test organism The strain used had a sensitivity of about 3 µg per ml. and was found suitable for the period when patients were having fairly large doses of chloramphenicol When doses of 1 5 g a day or less were given this organism was not sensitive enough, and another strain (K41) with a sensitivity of about 0 5 µg per ml would probably have been better

We had considerable difficulty at the beginning in not appreciating that both these organisms are much inhibited non specifically by the sera of many ill patients, and this intrinsic bacteriostatic action, plus the effect of chloramphenicol, prevented the growth of ordinary inocula in serum dilutions up to 1/250 in some cases This intrinsic bacteriostatic action is readily destroyed by inactivation for thirty minutes at 56°C and this should

always be done if any antibiotic is being tested against this type of organism

Chemical assays by the method of Glazko (1949) were also made in parallel with the biological methods On the whole, the results were similar in the lower ranges In the higher ranges the chemical estimation sometimes gave rather higher values than did the bacteriological This may have been because the chemical method does not distinguish chloramphenicol from some of its inactive metabolic products

The levels found in the patients on the orthodox Woodward Smadel treatment were similar to those already recorded by previous observers with the massive dosage of 20 g in forty eight hours the highest level reached was 150 µg per 100 ml by the bacteriological and 185 µg per 100 ml by the chemical method This was in a small man, who weighed only 7 st , in most of the patients on this dosage, however, only about 75 µg per 100 ml was reached

A rough correlation between the dose of chloramphenicol per kg of body weight and the blood chloramphenicol level was found, but there was a good deal of individual variation In all the patients on either the massive dosage or the orthodox régime the levels attained indicated satisfactory absorption of chloramphenicol, but there was no obvious association between those levels and the clinical results The levels we found in the blood while patients were having 1 5 g a day were, however, so low that we doubt whether the continuation of the ordinary course with this dosage had any therapeutic value

SUGGESTIONS FOR FUTURE TREATMENT

Our results have shown no significant difference in the relapse rate between those treated for forty eight hours only and those treated for longer periods Knight et al (1950) found that, though 3 patients treated for only sixty hours did not relapse 4 out of 10 treated for longer periods did They therefore suggest that, to avoid relapse, treatment should continue very much longer Smadel, at the Royal Society of Tropical Medicine on Feb 16, 1950, suggested tentatively that five days' treatment should be followed by five days' rest and then a further five days' treatment

From our experience the rest period seems too short, and we therefore suggest that treatment should be considered on the following lines initial treatment with chloramphenicol 3 g daily should be given until the patient is apyrexial, then there should be ten days' rest, and this should be followed by a further course of 3 g daily for three days

SUMMARY

21 cases of typhoid fever among passengers and crew of s s *Moolian* were treated with chloramphenicol In all of them the early result was satisfactory, but 12 of 21 cases relapsed, usually ten to sixteen days after cessation of therapy There was no correlation between relapses and previous dosage or duration of treatment

A modified scheme of dosage is suggested

Our thanks are due to Dr M T Morgan medical officer of health Port of London, for the information he has so freely placed at our disposal, Dr J C Thompson, who made the biochemical estimations of chloramphenicol in the blood and Mr B S Mansell and Mr J E S Greenstreet who did the greater part of the technical work

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CHLORAMPHENICOL IN SUBACUTE BACTERIAL ENDOCARDITIS

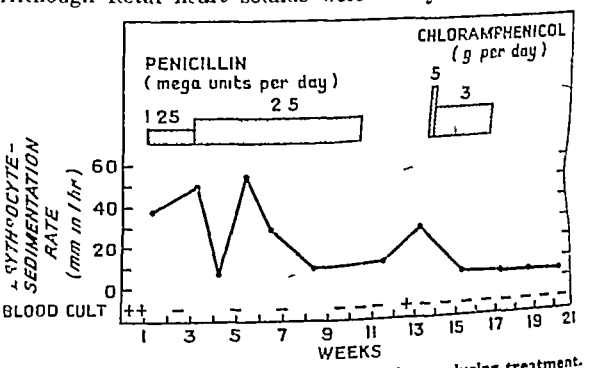
MICHAEL CURTIN
M D., B Sc N U I., M R C P I, D P H, D C H.
REGISTRAR, SHERIFF HILL INFECTIOUS DISEASES HOSPITAL, GATESHEAD ON TYNE

THE comprehensive antibacterial effect of chloramphenicol is demonstrated in the experiments of Gray (1950), who found that the upper respiratory tract becomes completely sterile during treatment with this antibiotic Evidence of its wide therapeutic range is provided in the reports of its successful use in viral rickettsial, spirochætal, and many bacterial infections The following case suggests that chloramphenicol may also have a place in the treatment of subacute bacterial endocarditis, when *Strep viridans* is the causal organism

CASE RECORD

On Oct 18, 1949, a woman aged 23, in the eighth month of pregnancy was admitted for investigation to Sheriff Hill Infectious Diseases Hospital She had noted the insidious onset some seven weeks previously, of generalised joint pains lassitude, anorexia, and malaise During the week before admission transient œdema of her ankles had developed

On examination the patient was apathetic, looked ill and was poorly nourished Her lips and conjunctivæ were pallid, and her skin had a light brownish yellow tint The finger showed early clubbing The pulse was of poor volume and tension Her apex beat was diffuse, and a palpable thrill was present Clinically the heart was enlarged The first sound in the mitral area was obscured by a loud harsh murmur, which continued throughout systole and was widely conducted The second sound in the pulmonary area was reduplicated Although fœtal heart sounds were clearly audible, uterine



Erythrocyte-sedimentation rates and blood-cultures during treatment.

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: S.R was 10 mm in one hour and 22 mm in two hours, ıér general condition had improved considerably Accord , on that date, penicillin was discontinued, after sixty five ' continuous treatment

bsequent Progress—On Jan 7, 1950, eight days after ıillin therapy had ended, the patient had a transient rise nperature to 99 4°F A blood culture taken on Jan 14 again *Strep viridans* On Jan 18 the E S.R had deteriorated to ın in one hour, and 66 mm in two hours

eatment with Chloramphenicol—It was decided to have infecting organisms tested for sensitivity to chloram ıcol, and it was found that chloramphenicol inhibited th in a dilution of at least 1 in 40,000 On Jan 23, after her blood culture had grown *Strep viridans*, a course of ramphenicol was begun, she was given 8 capsules (2 g) ıe first hour and then 2 capsules (0 5 g) four hourly for ıty two days (total 68 g) During treatment with chlor hemicol blood cultures were done every three days and grew *Strep viridans* By the tenth day of this treatment E S.R. had slowed to 5 mm in one hour and 8 mm in two s, and it did not again rise above this level

a March 15 it was noted that during the four weeks since end of the course of chloramphenicol the patient had ained apyrexial, her E S R. had been constantly well ın normal limits, and twice weekly blood cultures had been reported negative for *Strep viridans* Her general lition had greatly improved She said she felt perfectly , and asked to be discharged from hospital to continue ralescence at home

ollow up—On April 19 the patient was readmitted for mination Her general condition was good, her skin had a healthy colour, her appetite had returned, and she was gaining weight She was apyrexial and her E S R was 3 mm in one hour and 7 mm in two hours There was no anæmia (red cells 5,070,000 per c.mm, Hb 103% white cells 5100 per c.mm) There was clinical evidence of residual damage to the mitral valve, and the cardiac shadow showed considerable enlargement of the left auricle and ventricle, but there were no signs of congestive failure

COMMENT

The in vitro sensitivity of the infecting organisms, the rapid disappearance of *Strep viridans* from the bloodstream during treatment, and the corresponding rapid improvement in the E S R suggest that this patient was benefited by the chloramphenicol

It is fallacious to generalise on the response of a single case to a particular form of treatment, but it seems that chloramphenicol is worthy of further trial in subacute bacterial endocarditis, at least in *Strep viridans* cases which prove resistant to penicillin therapy

My thanks are due to Dr J Grant, medical superintendent who obtained permission from the Ministry of Health for the use of chloramphenicol in this case for his help and criticism, and to Dr R Norton, director of the Public Health Laboratory, Blakelaw, Newcastle upon Tyne, who carried out all the bacteriological investigations, including the chloramphenicol sensitivity tests

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Reviews of Books

ıtgraduate Obstetrics and Gynæcology

F J BROWNE, M D, D SC F R C S.E, F R C O G, emeritus professor of obstetrics and gynæcology, University of London, consulting obstetric surgeon University College Hospital London Butterworth 1950 Pp 501 50*s*

'rofessor Browne's book consists of material selected n talks given to doctors specialising in obstetrics and ıæcology If this fact is appreciated the arrangement l seem less surprising, and it will be understood that is not offering a complete textbook The reputation his lectures has reached many and distant parts of the rld He has written, as he has spoken, from a life s rk, and because he has always been a conscientious d accurate observer, the value of his statements is ıat The text is profusely illustrated with excellent otographs and pen and ink drawings, each chapter ds with a comprehensive bibliography to enable further ırch and research to be made, and a carefully compiled lex concludes the book

ssu nerveux et pathologie rénale

CHARLES DE MUYLDER, agrégé de l'enseignement supérieur Université Catholique de Louvain Paris Masson 1950 Pp 148 Fr 600

WE are already indebted to Dr De Muylder for luable studies of the renal innervation In this book aling with the normal and the pathological kidney, discusses our incomplete knowledge of renal histology, hich he has himself supplemented by embryological, mparative anatomical, experimental, and pathological udies

The special relations of nervous tissue with the kidney are finds, more than an innervation in the ordinary sense that term During development there is a mesectodermic ontribution with latent nervous possibilities to the kidney om the lumbar ganglionic crest This contribution appears be most precise at the level of the macular segment of the stal convoluted tubule and the epithelioid cells of the xtaglomerular apparatus are probably mesectodermal in rigin The nervous system provides the kidney with a ch though essentially vascular innervation with numerous rminal formations Nerve cells are few unmyelinated bres plentiful, myelinated fibres present but relatively rare n his view, the juxtaglomerular apparatus with its particu rly precise nervous contribution is probably the centre for the regulation of the nephron circulation He believes that renal ischæmia in man must in most cases be nervous in origin producing hypertension, when prolonged through an endocrine mechanism but he finds it impossible to decide with certainty, at present, which particular cells are responsible for the secretion

The work must interest all nephrologists It clears up many hitherto contentious points, summarises certain aspects of the literature, and stimulates thought However, those keeping track of investigations being made in many places on the renal innervation will realise that even this fine contribution cannot solve all the problems an international conference, at which all the evidence can be presented and fully discussed, is surely indicated Meanwhile, Dr De Muylder's new publication is welcome

Clinical Applications of Suggestion and Hypnosis

WILLIAM T HERON, PH D, professor of psychology, University of Minnesota Springfield Charles C Thomas London Blackwell Scientific Publications 1950 Pp 116 22*s* 6*d*

SINCE the heyday of hypnosis, at the turn of the century, little has been added to our knowledge of its indications and limitations Thus the monographs of Moll and of Forel, both published in 1889, give practically the same information as the numerous recent works In either case the theories advanced to explain its effects are far from plausible, and hypnosis remains a mystery which has resisted persistent and intelligent attempts to discover its true nature While its place in psychotherapy is now regarded as rather limited, the experience gained in learning to hypnotise is of great value in the training of psychotherapists, whatever methods they may later employ It is reasonable to suggest, too, that a background knowledge of the technique can assist the anæsthetist in his approach to some kinds of patient, however mechanised his art has now become

In hypnotising the first few cases everything depends on a sound technique and a suitable attitude to the task. Professor Heron s lucid manual is full of really practical help The book is addressed to the professional reader, with a proper respect for the dangers of the method in uninformed hands The author s proposals for the use of hypnosis and suggestion in dentistry will be of interest to any dental surgeons not influenced by the time factor, and the instructions given are easy to follow The idea of getting the edentulous patient under hypnosis to imagine himself at the age when he had sound teeth and to shut his mouth and hold it as he did then,

always be done if any antibiotic is being tested against this type of organism

Chemical assays by the method of Glazko (1949) were also made in parallel with the biological methods On the whole, the results were similar in the lower ranges In the higher ranges the chemical estimation sometimes gave rather higher values than did the bacteriological This may have been because the chemical method does not distinguish chloramphenicol from some of its inactive metabolic products

The levels found in the patients on the orthodox Woodward Smadel treatment were similar to those already recorded by previous observers with the massive dosage of 20 g in forty eight hours the highest level reached was 150 μg per 100 ml by the bacteriological and 185 μg per 100 ml by the chemical method This was in a small man, who weighed only 7 st , in most of the patients on this dosage, however, only about 75 μg per 100 ml was reached

A rough correlation between the dose of chloramphenicol per kg of body weight and the blood chloramphenicol level was found, but there was a good deal of individual variation In all the patients on either the massive dosage or the orthodox régime the levels attained indicated satisfactory absorption of chloramphenicol, but there was no obvious association between those levels and the clinical results The levels we found in the blood while patients were having 1 5 g a day were, however, so low that we doubt whether the continuation of the ordinary course with this dosage had any therapeutic value

SUGGESTIONS FOR FUTURE TREATMENT

Our results have shown no significant difference in the relapse rate between those treated for forty eight hours only and those treated for longer periods Knight et al (1950) found that, though 3 patients treated for only sixty hours did not relapse, 4 out of 10 treated for longer periods did They therefore suggest that, to avoid relapse, treatment should continue very much longer Smadel, at the Royal Society of Tropical Medicine on Feb 16, 1950, suggested tentatively that five days' treatment should be followed by five days' rest and then a further five days' treatment

From our experience the rest period seems too short, and we therefore suggest that treatment should be considered on the following lines initial treatment with chloramphenicol 3 g daily should be given until the patient is apyrexial, then there should be ten days' rest, and this should be followed by a further course of 3 g daily for three days

SUMMARY

21 cases of typhoid fever among passengers and crew of s s *Moolian* were treated with chloramphenicol In all of them the early result was satisfactory, but 12 of 21 cases relapsed, usually ten to sixteen days after cessation of therapy There was no correlation between relapses and previous dosage or duration of treatment

A modified scheme of dosage is suggested

Our thanks are due to Dr M T Morgan, medical officer of health, Port of London, for the information he has so freely placed at our disposal, Dr J C Thompson, who made the biochemical estimations of chloramphenicol in the blood and Mr B S Mansell and Mr J E S Greenstreet who did the greater part of the technical work

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CHLORAMPHENICOL IN SUBACUTE BACTERIAL ENDOCARDITIS

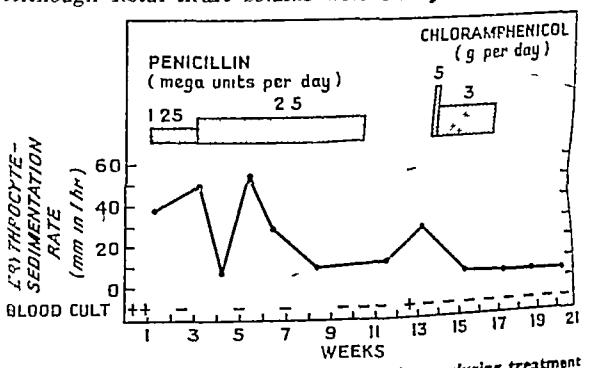
MICHAEL CURTIN
M.D , B Sc N U I , M R C P I D.P H , D C.H.
REGISTRAR, SHERIFF HILL INFECTIOUS DISEASES HOSPITAL, GATESHEAD ON TYNE

THE comprehensive antibacterial effect of chloramphenicol is demonstrated in the experiments of Gray (1950), who found that the upper respiratory tract becomes completely sterile during treatment with this antibiotic Evidence of its wide therapeutic range is provided in the reports of its successful use in viral rickettsial, spirochætal, and many bacterial infections The following case suggests that chloramphenicol may also have a place in the treatment of subacute bacterial endocarditis, when *Strep viridans* is the causal organism

CASE RECORD

On Oct 18, 1949, a woman aged 23 in the eighth month of pregnancy, was admitted for investigation to Sheriff Hill Infectious Diseases Hospital She had noted the insidious onset some seven weeks previously, of generalised joint pains lassitude, anorexia, and malaise During the week before admission transient œdema of her ankles had developed

On examination the patient was apathetic, looked ill and was poorly nourished Her lips and conjunctivæ were pallid and her skin had a light brownish yellow tint The fingers showed early clubbing The pulse was of poor volume and tension Her apex beat was diffuse, and a palpable thrill was present Clinically the heart was enlarged The first sound in the mitral area was obscured by a loud harsh murmur which continued throughout systole and was widely conducted The second sound in the pulmonary area was reduplicated Although fœtal heart sounds were clearly audible, uterine



Erythrocyte-sedimentation rates and blood-cultures during treatment

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THE LANCET

LONDON SATURDAY, DEC 16, 1950

Liquefaction of Exudates

In the old pre-antibiotic days the clinician treating empyema had to depend on the formation of fibrinous and later fibrous adhesions between visceral and parietal pleura to obliterate the abscess cavity and extirpate the infection This was achieved only at the cost of some permanent fibrosis with impairment of lung movement The advent of effective anti bacterial agents has profoundly changed the outlook Now that the infection can readily be controlled with penicillin or some other agent the deposition of fibrin is an actual disadvantage, not only because of the late effects of fibrosis but because the drug cannot make contact with bacteria enmeshed in a fibrinous network That is why various methods are being tried to combat the formerly essential process

One method, already reviewed in these columns,[1] is that of TILLETT and colleagues,[2] using two enzymes produced by hæmolytic streptococci of group A and some other groups These are streptokinase, or SK, which reacts with globulin in plasma or exudate to become actively fibrinolytic, and streptodornase, or SD, a deoxyribonuclease able to liquefy the stringy fibrils of nucleoprotein, derived from dead leucocytes, that are largely responsible for the viscosity of pus The effects of injecting these enzymes into the pleural cavity have been studied by JOHNSON,[3] who has demonstrated that they can cause the disappearance of extracellular deoxyribonucleic acid and degenerating cell nuclei from purulent exudates without interfering with the activities of living leuco cytes He ascribes the clumping of leucocytes in pus to their being caught in a matrix of nucleoprotein, since the clumps disintegrate on the addition of deoxyribonuclease SK has proved its value in major thoracic surgery by making large hæmatomas liquid enough to be aspirated, and SD's assistance in the sterilisation and aspiration of abscesses has also been borne out in practice The two substances have been separated and purified by CHRISTENSEN's[4] method, and their clinical uses are reviewed by BLATTNER[5] Their toxicity will depend on the purity of the prepara tions used and the type of lesion treated, in America, the intrapleural injections were followed by transient febrile reactions and only moderate degrees of malaise At Great Ormond Street, CATHIE has used a somewhat cruder preparation of SK (presumably containing SD),[6] mixed with streptomycin, for intrathecal injec tion in children with tuberculous meningitis His preliminary results were encouraging, and in this issue (p 784) he and Dr MACFARLANE bring their experience up to date Altogether, since February, 1947, they have treated 60 cases The 20 who formed their first series received streptomycin only, intramuscularly and intrathecally, and 5 (25%) of these are still alive, 4 with normal cerebrospinal fluid (C S F) The remaining 40 cases were treated with intramus cular streptomycin and intrathecal injections of streptomycin plus SK, 34 of them also receiving intra thecal 'Sulphetrone', 23 (58%) of this second series of 40 have survived, 17 with normal C S F Credit for the improved results is mainly given to the SK, and CATHIE and MACFARLANE are doubtful whether the addition of sulphetrone had any effect In their routine course the intrathecal injections were limited to 24 spread over six weeks, but there were individual variations, depending on the response to treatment They emphasise the importance of giving SK from the beginning, before the fibrin clot becomes organised In Melbourne, WILLIAMS and BAZELEY[8] have used a highly purified preparation of SK in much the same way Their material has been given over long periods and in repeated courses without causing any obvious reaction in the theca The clinical results are not dramatic—of the 9 cases treated, 3 seem likely to survive, compared with 5 of the 27 treated before the addition of enzyme was started—but nevertheless the method is thought to deserve further trial.

Last week (p 739) ARMSTRONG and WHITE reported their work on deoxyribonuclease obtained from ox pancreas They explained the tendency for the deoxyribonucleic acid (or the nucleoprotein) to undergo polymerisation and to take the form of fibrils or rods, and they showed that the viscosity of thick purulent sputum is due to these fibrils, which stain by the Feulgen method like cell nuclei They described the isolation of the enzyme, D N-ase, from ox pancreas 10 kg of which yielded 2 5 g of dry enzyme Large intravenous and intratracheal injections of D N-ase into rabbits caused no toxic symptoms, but later the rabbits' serum developed precipitins capable of inhibi ting much of the enzymic activity In vitro, the D N-ase activity was very high, and the fibrils in smears of sputum were liquefied leaving living leucocytes unchanged The preparation was given as an inhala tion spray to patients with purulent sputum, and it produced the expected liquefaction, the volume of sputum increasing at first and then lessening Injections of the solution into an empyema cavity success fully liquefied the exudate In its potency and freedom from toxicity this seems to be a preparation of great promise, and its cost should not be prohibitive

With the same objects of liquefying purulent material and securing better contact between antibiotic and bacterium, GRACE and BRYSON[9] in New York have for some years been advocating the addition of a detergent to solutions of penicillin in the local treatment of chronic osteomyelitis Systemic penicillin is given at the same time They insist that in such cases surgery should be limited at most to excision of the sinus track and drilling of the bone to permit the insertion of a T-tube into the marrow cavity There after a solution containing 10,000–20,000 units of penicillin per ml and 0 1% of a detergent is instilled down the tube four hourly for ten days or so There

1 Leading article *Lancet*, 1950, 1 629
2 Tillett, W S., Sherry S Christensen L R Johnson A J Hazlehurst G *Ann Surg* 1950, 131, 12
3 Johnson A J *J clin Invest* 1950 29 1376
4 Christensen L R *Ibid* 1949 28, 103
5 Blattner R J *J Pediat* 1950 36 827
6 Cathie I A B *J clin. Path* 1949 2 73
7 Cathie I A B *Lancet* 1949 1 441
8 Williams S. Bazeley P L *Med. J Aust* 1950 11 690
9 Grace E. J Bryson V *Surg Gynec. Obstet* 1950 91 332

while the bite is adjusted, must be original, and Professor Heron is careful to point out that the success of the method is attested only by the reports of a number of dentists rather than by any scientific evidence

This book is a sound guide for anyone who wishes to learn to hypnotise or to improve his technique The hypnotist is presented as the tutor of his patient rather than as a dramatic figure imposing his will on another, and the book is notably free from doubtful claims and speculations

Injuries to the Ankle

J GRANT BONNIN, M B Melb, F R C S, orthopædic surgeon, Central Middlesex Hospital, London London Heinemann Medical Books 1950 Pp 405 63s

BECAUSE Mr Bonnin evidently has a passionate interest in fractures and other injuries around the ankle-joint, and can communicate his enthusiasm, his book will interest every practising orthopædic surgeon—though it may not appeal to less senior students Enthusiasm has its drawbacks, however, and the lengthy expositions of the historical and experimental aspects of the subject and a somewhat over-zealous classification of injuries by their mechanism of production may tire the reader searching for practical advice This is a pity, for sound surgical guidance in treatment is there in abundance, though embedded in other material Mr Bonnin is an advocate of open operation, evoking the spirit of Lane but though it is clear that, in his hands, operative fixation of ankle fractures gives excellent results, the experience of others less skilful may prove less happy

Despite the strains which in places it imposes on the reader, this book is likely to prove a success

A Clinical Pathology Application and Interpretation

BENJAMIN B WELLS, M D, PH D, professor of medicine, University of Arkansas Philadelphia and London W B Saunders 1950 Pp 397 30s

THIS comparatively small book differs in approach from the standard works on the subject "Beginning with a clinical situation, the applicable laboratory procedures are selected and their contributions to the problem are discussed with just enough theory and methodology to convey proper meaning and purpose" There are few illustrations and very few references are given, though it is apparent that many have been consulted The scope is limited, but the book may help the clinician to choose and understand simple tests

An Introduction to Personality Study

RAYMOND B CATTELL, research professor in psychology, University of Illinois London Hutchinson's University Library 1950 Pp 235 7s 6d

IN the more descriptive parts of this handbook Professor Cattell has drawn effectively on the writings of Freud and McDougall He is less fortunate in his attempt to apply the statistical techniques of "factorial analysis" to his concepts of human personality The book will be of value to undergraduate students of psychology, for it contains much material in summary and schematic form, and a number of useful comparisons are made between writers of different schools It cannot be recommended as an introduction to the subject for those whose primary interests lie in other fields

A Pocket Obstetrics

(2nd ed) ARTHUR C H BELL, F R C S, F R C O G, obstetric surgeon, Westminster Hospital, London London J & A Churchill 1950 Pp 156 7s 6d

If time is short and knowledge weak
Synopsis series you may seek
This little work by Arthur Bell
May do the job and suit you well
(A book condensed but still complete,
May yet examiners defeat)
The text is brief and quickly told,
Advice is sound and dogma bold,
But do not, reader, be misled
For all our praise, it can't be said
That Bell's synopsis, be it good,
Replaces textbooks, never could!

British Encyclopædia of Medical Practice (2nd ed London Butterworth Medical Publications 1950 Vol 3 Pp 669 £3)—The new edition of this important work, edited by Lord Horder, is coming out at a spanking pace, the first three volumes have appeared in four months The publishers can fairly claim that, with the annual cumulative supplement, the articles never fall greatly behind the times Moreover, the supplement can readily be correlated with the main volumes, whose pages contain key numbers for cross-reference

Operations of General Surgery (2nd ed Philadelphia and London W B Saunders 1949 Pp 890 67s 6d)—The second edition of this textbook by Prof Thomas G Orr, of Kansas, has had so many additions that it is almost a new book Certainly it is much more useful to the general surgeon It now contains descriptions of modern operations upon the lungs, œsophagus, and blood vessels, and everywhere are signs of extensive revision Even greater help would have been given to the reader if more had been said about the difficulties and risks met in carrying out the instructions laid down But as a bibliography is attached to each section, those interested can refer to original sources

Orthopædic Surgery (4th ed London Edward Arnold 1950 Pp 1016 50s)—This is the first new edition of Prof Walter Mercer's textbook since the war, and marks almost two decades of continuous success with generations of students The well revised volume now runs to over 1000 pages, but its comfortable personal style makes it easy reading The thoughtful essays on cervical and lumbar intervertebral disc prolapse are notably sound, and it is gratifying to see the management of peripheral vascular disease retained in an orthopædic textbook The sections on osteomyelitis and infections of the hand perhaps have an over surgical approach to treatment, nowadays somewhat outmoded, and the importance of deciding between primary or delayed suture in osteomyelitis is not perhaps sufficiently stressed But these are minor criticisms of an old favourite

Fortschritte der Tuberkuloseforschung (Basle Karger 1950 Pp 307 Sw fr 38)—To write a critical analysis of recent work, and review the subject lucidly and comprehensively in the light of such work, is never easy Two articles in this volume are outstanding that by G Canetti on tuberculous allergy, and a second by Canetti and G Rocher on streptomycin resistance They will be a valuable guide to workers who approach these subjects afresh, but also to those lost in the morass of accumulated literature Each article in the volume is by an acknowledged authority in the particular field reviewed Florence Seibert summarises progress in the chemistry of tuberculin G Middlebrook writes on recent advances in bacteriologic research, K Diehl on congenital factors in tuberculosis, and H Good on the surgery of pulmonary tuberculosis The editors, H Birkhäuser of Basle and H Bloch of New York, have performed a useful service Two of the articles are in English, two in French and three in German

Metabolism and Function (Amsterdam Elsevier London Cleaver Hume Press 1950 Pp 348 57s 6d)—This book, edited by Dr D Nachmansohn and described as a collection of papers dedicated to Otto Meyerhof on his 65th birthday, is an attractively bound reissue of the first 348 pages of *Biochimica et Biophysica Acta* (1950, vol 4) Such unity as it has derives from the fact that the contributors are past or present co workers of Meyerhof's, or have been stimulated by the work of this versatile man However, Meyerhof's own interests are so wide that there is as much variety in this volume as might be expected in a normal issue of the journal The first section on Muscle, includes 7 papers, then follow 6 on Nerve and 3 on Drug Action, and the fourth section headed Intermediate Metabolism, contains 22 contributions on various aspects of animal, plant and microbiological chemistry The more general articles include A V Hill's Challenge to Biochemists, with which the section on muscle opens and von Muralt's interpretation of the development of muscle chemistry as a lesson in neurophysiology Nachmansohn has contributed an interesting paper on the relation of permeability to axonal conduction and synaptic transmission arguing that acetylcholine is concerned primarily in the former Wald writes of the interconversion of retinenes and vitamins A Krebs has sought to correlate tissue metabolism with body size in a range of animals from mouse to horse and incidentally includes a useful table of what is known of the composition of human plasma

for Reconstruction and Development, or governments outside the area Indeed it is proper to describe the report as a prospectus advertising for subscribers to this £839 million loan But the prospectus is peculiar in that there is no promise of financial dividends In fact, the word dividend does not appear in the report, and obviously the returns will not be measure able only in rupees, pounds, or dollars, but mostly in more abstract assets The final sentence in the report is "In a world racked by schism and confusion it is doubtful whether free men can long afford to leave undeveloped and imprisoned in poverty the human resources of the countries of South and South East Asia, which could help so greatly, not only to restore the world's prosperity, but also to redress its confusion and enrich the lives of all men everywhere" In all the great problems of South East Asia, economic factors, moral values, and the state of the public health are intimately interwoven The Colombo plan calls on men and women throughout the British Commonwealth and in Europe and the Americas for financial sacrifices in order to "enrich the lives of all men everywhere" This is a noble aim the evidence submitted suggests that it can be attained by full application of new scientific knowledge, provided this is not hampered by too much old fashioned human wickedness

The Tuberculosis Service

"The inadequacy of the present provision for the diagnosis, treatment and aftercare of tuberculosis is a national scandal "

WITH this round shot the Tuberculosis and Diseases of the Chest Group Committee of the British Medical Association open a report, recently approved by the B M A council, on tuberculosis and the National Health Service At the end of last year there were 11,000 patients awaiting admission to the 23,000 beds provided for treatment, and there is no reason to suppose that the situation has since changed spec tacularly for the better, though the Minister of Health recently stated that the general hospitals have now been responsible for "a very large increase in the number of beds" Though mortality from the disease continues to fall, contacts multiply, and notifications are rising The Ministry of Health, the committee believe, clearly intend that the existing tuberculosis arrangements should be expanded into a branch of medicine dealing with all diseases of the chest, but this plan has been handicapped so far by the segregation of the tuberculosis service from other medical services The chest clinic, the committee rightly insist, must be linked with the hospital Again, prevention, social welfare, and aftercare of tuberculous families, though they are the responsibility of the local authorities, are duties which the committee find inseparable from the work of the chest physician he should undertake them on behalf of the local authority, working as a consultant in close collaboration with the medical officer of health

The chest clinics will have to be built up from the present dispensary service, and "many tuberculosis dispensaries, especially those which are part-time, have no X ray equipment, no access to the basic services of a general hospital, and are inadequately housed in converted dwelling houses, local government offices, and the like" Unequipped visiting stations of this kind, the committee think, should be retained only for special purposes—e g, for inter viewing in rural areas Chest clinics proper should be associated with general hospitals, and established in some sanatoria Large full time chest clinics, with a permanent specially trained auxiliary staff, already exist in some hospitals The committee suggest that the establishment of part time chest clinics in smaller hospitals may upgrade such hospitals and enable them to offer specialist services previously available only at distant larger hospitals They do not mention the cost of such upgrading of hospitals, but it must be borne in mind that all expenses incurred to improve care of the tuberculous must be saved from the cost of other activities in the health service It is right and necessary that such concessions should be made to a body of patients whose need is so great, but it is unlikely that those working in other branches of medicine will hurry forward with proposals for reducing their own outlay The responsibility for redistributing funds so as to allow of the expansion of the tuberculosis service lies fairly and squarely on the regional hospital boards

The committee judge that in an urban area the optimum size of population to be served by a chest clinic is 200,000, in country districts the number would be less This estimate agrees with that made by the Scottish Joint Subcommittee[1] last July. Both bodies thought that in compact urban areas with good public transport it is better to have one central fully equipped clinic than a number of minor ones Such a clinic, the B M A. committee find, will need to take at least 5000 radiographs a year, and this means there must be an X-ray department in the clinic itself Consulting and treatment rooms should be equipped for fluoroscopy Small part-time clinics should use the X ray department of the hospital to which the clinic is attached, but the committee suggest that the radiologist should be willing to leave routine reporting on these films to the chest physician A chest clinic serving a population of 200,000, they say, would need a consultant and two assistant chest physicians, with an appropriate staff of registrars, an almoner, 5 health visitors and clinic nurses, and 5 clerks Apart from any wards for the treatment of tuberculosis in general hospitals, there should also be some beds for diagnosis and assessment, and where possible these should be associated with a thoracic surgery unit Each chest physician should control some of these beds in a general hospital The development of chest clinics in general hospitals should make it easier for chest physicians to collaborate with their other specialist colleagues, and particularly the thoracic surgeon Such arrangements, though they would give the chest physician a much firmer footing in the hospital than he has at present, are hardly the equiva lent of the chest units envisaged by the Scottish sub committee as "designed to include both the hospital and dispensary aspects of the service, and served by a single integrated staff"

The B M A committee put the bed requirements for pulmonary tuberculosis at 1 per 1000 population,

1 Tuberculosis Service in Scotland. Report of a Subcommittee appointed jointly by the Central Consultants and Specialists Committee in Scotland, and the Tuberculosis Society of Scotland. *Brit med J* 1950 II 61

can be little doubt that the detergent assists in the disintegration of pus, blood-clot, and other debris, and its action may be like that of D N ase The suggestion that it also assists the drug to penetrate deeper into infected bone and thus sterilise it is harder to support The irritant action of the detergents is said sometimes to impede treatment, but further information on this point is needed It would also be valuable to have a control series, operated on by the same hands and treated by the same technique but with streptomycin (to control resistant bacteria) instead of the detergent Without some such controls the part played by the detergent must remain uncertain, which is unfortunate since it would presumably be the cheapest of the liquefying agents

Finally, there is a summarised report[10] from New York on the use of highly purified crystalline trypsin, prepared in the Armour Laboratories Dr REISER and his colleagues told the recent congress of the American College of Surgeons, according to the report, that they have washed out the cavity in tuberculous empyema with a solution of trypsin daily for seven to ten days, and that all pus, debris, and caseous material can then be aspirated, leaving the walls of the cavity clean and sterile How many cases have been treated is not stated An announcement from Armour Laboratories shows that the preparation is expected to be of value, like D N ase, in cleansing infected areas such as lacerated wounds, bronchi, and sinuses In view of the well-known sequelæ of pancreatic fistula it seems remarkable that normal tissue escaped damage, but further reports will be awaited with interest

These investigations, though still in their infancy, offer real hope of improvement in the methods for dealing with hæmatoma and local infection Not only may they bring susceptible organisms and antibiotics better into contact, but the outpouring of fresh serum and leucocytes which follows the removal of stale exudate can be a valuable aid against some of the gram negative bacilli which are often resistant to antibiotics But clinicians should remember that the enzymes mentioned are antigenic and may give rise to sensitisation Moreover, as PARISH[11] points out, fibrin has its uses, and its removal in the immediate postoperative period might lead to hæmorrhage or to leakage from a sutured viscus

The Colombo Plan

"The Colombo Plan for Cooperative Economic Development in South and South East Asia,"[12] prepared by a Commonwealth consultative committee including representatives of the governments of Australia, Canada, Ceylon, India, New Zealand, Pakistan, and the United Kingdom, was presented to Parliament by the Chancellor of the Exchequer last month It begins by summarising the present economic position of all the countries in the region, whether they belong to the Commonwealth or not In general the great havoc wrought by the war has been made good, but no more Thus in 1949 the production of rice, wheat, and sugar was approximately the same as before the war, for fats and oils, recovery is also nearly complete Rubber, petroleum, and tea production are well beyond what they were in 1939, but jute and cotton supplies show no signs of rising from low war-time levels Pre war rates of production, however, cannot even maintain the low pre war standards of living and poor health records, for the population of this region grows at the rate of 20,000 persons a day At this rate of increase, the present 570 million inhabitants of the area will have become 720 million by 1970, and if these new citizens of the world are to have a life worth living, the supplies both of foods and of other raw materials must be greatly raised This demands the application of new scientific techniques, on a grand scale, to the age old problems

The Colombo plan describes development schemes already drawn up in India, Pakistan, Ceylon, Malaya, and North Borneo, and discusses their finances A capital investment of £1868 million is needed between 1951 and 1957 Of this sum, 32% is wanted for agricultural purposes, 34% for transport and communications, 16% for industry, fuel, and power, and 18% for social and health services The schemes cover a wide variety of purposes, but the most important are some ten huge new river dams by means of which it is hoped to irrigate 13 million acres of land and increase electric generating capacity by 1 1 million kilowatts (67% of the total present capacity) These two figures give some conception of the potential wealth in these countries For realising the schemes, not only capital but also expert knowledge is required, and a table lists the categories of 1300 technical experts who will have to be brought from overseas The greatest shortage is of mechanical and water engineers, and the report lays stress on the importance of these experts for the future of our civilisation Among a variety of specialists, the list includes 80 doctors Most of these are needed to fill temporary appointments for one or two years, and clearly they will have to be men and women of established professional reputation It is to be hoped that medical schools and hospitals in this country will enable members of their staffs to take up such temporary appointments without loss of prospects on return home The scheme also involves sending many doctors, nurses, and social workers abroad for postgraduate training Thus the Indian government's plan includes overseas training for more than 1100 medical workers, Pakistan hopes to be able to send 50 nurses abroad for two or three years each, and Ceylon plans to send out 30 doctors a year for post graduate training If Great Britain is to maintain her present position as a centre for such training at least a proportion of our teachers must be familiar with the social and economic background against which such students will be working when they go back to their homes

Throughout the report there is emphasis on the necessity of the new ventures in order to promote health and combat disease But the overwhelming practical consideration is, of course, finance Of the £1868 million of capital, it is estimated that the countries themselves can subscribe no more than £783 million, sterling balances will provide a further £246 million, but the remaining £839 million must come from other sources it is suggested that these may be either private investors, the International Bank

10 *New York Times* Oct 25, 1950
11 Parish H J *Lancet* 1950 I 736
12 Cmd 8080 H M Stationery Office Pp 101 3s Also a popular illustrated summary (New Horizons in the East) Pp 40 1s

velve years' experience has shown that the bulwarks the law need strengthening here and there and that iere are open loopholes not seen by those who framed it erhaps the most daring proposal, at a time when ich north wind brings us fierce and Doric complaints of Whitehall government," is that these sections of the ct shall be extended to Scotland We hope that this dvice will be followed and that medical officers of health orth of Hadrian's wall will find them as useful as do heir colleagues here But it is the suggested code of ractice that is likely to have most effect in improving he hygiene of a trade in which bacterial contamination s only too easy

Of 66,830 manufacturers, only just over 1% can be lassified as large scale enterprises, and it is the general xperience that these show a laudable ambition to pro duce goods of the best possible hygienic standard The smaller firms—bakers, pie makers, and butchers—may equal the best of their larger competitors but often, in fact, they fall behind They lack staff with specialised skill, the equipment which obviates the handling of food, space to work, and above all, know ledge of what can and should be done to avoid infection of these vulnerable foods We suspect too that the fear of a civil prosecution for damages following food borne infection lies less heavily upon them than upon those firms whose names are on every hoarding The principal problem of the working party was therefore to suggest means of persuading and helping the smaller man to raise his hygienic standards

Some unsatisfactory features of the trade lend them selves to legal control premises must be licensed and reach standards of construction which can be defined, domestic animals must be excluded, employees must wear clean overalls But these rules alone are unlikely to effect much, and it is evident that the risks of contamination of food arise mostly from poor super vision, slovenly habits, and sheer ignorance of what constitutes dirty practices The problems are those of applied bacteriology, and no honest hygienist would care to draft regulations for universal application with the promise that their enforcement would end the contamination of meat products But expert knowledge can suggest many improvements in existing custom, and we hope that persuasion and advice to a trade that is eager for self improvement may lessen what has been a serious risk to the public health Mr Badman will always be with us, but the law as it stands can be used to check the more grossly insanitary practices, and, since good hygiene is likely to go with good flavour and attractive appearance, we can expect support from a public which is becoming increasingly particular in its choice For years legal penalties have been employed in the attempt to enforce cleanliness in the production of milk, but many observers would agree that greater improvement has resulted from the parochial visiting of the National Agricultural Advisory Service and the refusal of the wholesalers to accept sour milk

Some details in the report deserve further notice The dangers of gelatin are rightly emphasised Few things that we eat are better culture media for bacteria, patho genic and otherwise, and at least one outbreak of staphylo coccal food poisoning extending into several counties has been traced to this source It can be sterilised by heat, but repeated boiling will spoil its "gelling" properties Slow cooling of cooked food is recognised as dangerous, since a temperature likely to encourage bacterial multiplication may persist for many hours and the trade might well promote the design of cheap and effective chilling plant for the small manufacturer and the communal kitchen Perhaps the part of the report most interesting to doctors is an appendix detailing suggestions by the staff of the Birmingham Accident Hospital for the dressing of small wounds of the hands of those engaged in this and similar trades where soiling and wetting of the hands is unavoidable It seems worthy of trial among nurses and our own profession [13]

And lastly we would direct the attention of the socio logist to the extraordinary variety of made up meat foods which tickle the national palate Now, gentlemen, what do you choose? Aislet, faggots, haslet, haggis, hog's pudding, or polony?

RADIOSODIUM TREATMENT OF BLADDER TUMOURS

PAPILLARY carcinomas of the bladder have been treated by many methods since Beer introduced dia thermy treatment in 1911 Any one method may be effective in a particular type of lesion, for the bladder is pleomorphic in the tumours it produces and no single treatment is likely to suit them all

A new form of radiation therapy by means of isotopes seems to be remarkably successful in patients with multiple small papillary carcinomas, sometimes called papillomatosis, provided the lesions are still confined to the mucosa and have not yet infiltrated the muscle layers It is now believed that in this condition the mucosa is in a premalignant state and the multiple tumours are evidence of a multicentric origin Any treatment, such as diathermy, that is directed against only the obvious manifestations of the disease will therefore be incomplete, and new tumours may be expected to follow Intracavitary irradiation with an isotope entails the insertion of a thin walled rubber balloon into the bladder—in men through a perineal urethrostomy, in women per urethram—and subsequent filling of the balloon with a solution of the radioactive isotope (150–200 ml) With this degree of distension the bladder mucosa is stretched over the surface of the balloon, and a tumour will be pressed firmly against the source of irradiation The most effective isotope has been radiosodium (Na^{24}) made by irradiating common salt or sodium iodide for a week in the atomic pile Na^{24} has a relatively short half life, so that apparatus contami nated with it will be safe after a few days During its disintegration this isotope emits gamma and beta rays, and the quantities used in treatment administer to the tumours a dose of gamma radiation comparable to that from 0 5 g of radium used in the same way The mucosa of the bladder receives a high intensity homogeneous dose, but the intensity rapidly falls as the rays pass through the tissues, and the bladder muscle therefore receives a considerably smaller dose, while the extra vesical tissues are scarcely irradiated at all The duration of treatment is only about three to four hours, during which the bladder mucosa receives about 3000 r in the form of gamma rays and a similar amount as beta rays At the end of treatment the balloon is removed, and the patient is usually fit to return home within a week Because of the minimal surgical interference this is a suitable treatment for the elderly and the frail The rapid falling off in the strength of irradiation prevents undesirable reactions in the skin or rectum

The late results of radiosodium treatment will not be known until a sufficient number of cases have been fol lowed up, but of the 30 patients treated at the Royal Cancer Hospital [14] in the last eighteen months there are already 17 who are tumour free, judging by cystoscopy and mucosal biopsy Complications may arise from underdosage or overdosage If the dose is too small tumour regression is incomplete or absent and a second insertion of isotope is necessary Where the dose has been too large the patients develop severe frequency of micturi tion some four weeks later, and this may persist for several months even when the urine is sterile In 2

13 Schilling, R S F Roberts M Goodman N *Lancet* 1950 1 293
14 Wallace, D M Walton R J, Sinclair W K *Brit J Urol* 1949 21 357

which is somewhat lower than the Scottish estimate The Scottish subcommittee thought that many of the beds required could be provided in hospitals for infectious diseases, but the B M A committee hope rather for the provision of more beds in general hospitals, and for the reopening of more sanatorium beds This last depends on better nursing recruitment Well planned propaganda, they believe, would present tuberculosis as an urgent national problem, and the interest of nurses could be aroused by teaching them something of modern achievements in treatment Student nurses should have the opportunity of working in approved sanatoria or chest hospitals as part of their training Even more important are proposals that trained or untrained nurses suffering from tuberculosis should be thoroughly reabled, that living quarters and amenities for resident staff should be of the highest order, and that there should be some form of effective representation of sanatorium nurses on the General Nursing Council

Prevention, care, and aftercare, which are the responsibility of the local authorities, are inseparably linked with treatment, and though clearer division of duties by regulation is necessary, the chief need is collaboration between people The things to be done, regardless of who is to do them, are close supervision of notifications health education of the public, the development of assisted housing schemes, mass radiography, control of milk supplies, B C G vaccination, examination of contacts, aftercare and help for the family, the provision of home helps, and reablement There is plenty here to keep both the clinical and the public health teams fully occupied, and to get through it they must work well together

Annotations

VAGARIES OF HERPES ZOSTER

HERPES ZOSTER characteristically affects the posterior root ganglia, but commonly the nervous system is more widely involved [1] There may be mild localised leptomeningitis with lymphocytic infiltration, inflammatory changes in the posterior and anterior horns of grey matter at the level where the spinal ganglia are affected, or peripheral mononeuritis both in the sensory nerves distal to the ganglion and also in the corresponding anterior root These changes may be reflected in mild meningeal irritation with an excess of lymphocytes in the cerebrospinal fluid and occasionally by a lower motor neurone palsy involving muscles supplied by the anterior roots corresponding to the affected posterior root ganglia [2] This palsy is found most often with zoster in the 5th and 6th cervical segments, when weakness of the shoulder girdle muscles appears with, or a few days after, the herpetic eruption, but with a lower dorsal zoster the anterior abdominal muscles may be paralysed, while with zoster at the level of the 2nd and 3rd lumbar segments the quadriceps femoris is paralysed As to the cranial nerves, herpes zoster otiticus, or the Ramsay Hunt syndrome,[3] is relatively common, here the vesicles are often in the external auditory meatus, sometimes spreading on to the pinna, and are accompanied by a peripheral facial palsy and possibly by labyrinthine disturbance Ramsay Hunt ascribed the facial palsy to involvement of the geniculate ganglion by zoster, but he had no supporting pathological evidence, and Denny Brown,[1] in a detailed pathological study of a case, found no changes in the geniculate ganglion but patchy infiltration with lymphocytes throughout the course of the facial nerve—a motor mononeuritis such as may occur in spinal anterior roots With ophthalmic zoster also, spread of the infection to neighbouring nerves is occasionally evident, there may be partial oculomotor palsy, while rarely unilateral optic atrophy is a complication Unilateral paralysis of the palate, pharynx, and larynx [4] may be an accompaniment of zoster vesicles on the posterior wall of the pharynx and larynx Much less commonly, the central nervous system is extensively involved encephalitis [5] has been reported, the herpetic rash preceding the onset of cerebral symptoms by some days or even weeks, and diffuse myelitis apparently due to zoster has been described

The evidence that the viscera may be involved is not so clear The best authenticated cases are those with urinary symptoms Oppenheim [6] described transient paralysis of the bladder associated with sacral zoster, while Dubois [7] reported a case with herpetic lesions on the left buttock associated with urinary frequency and dysuria and finally retention of urine, in which cystoscopy revealed typical vesicles on the left side of the base and on the left lateral wall of the bladder Furthermore, cases in which the bladder was very probably involved have been recorded by Durget [8] and by Chesterman [9] Zoster of the pleura seems the probable explanation of the clinical picture in Russell Brain's [10] patient, in whom zoster affecting the 5th and 6th dorsal segments on the left side was accompanied by severe pain on breathing and a harsh pleural rub exactly under the area of the cutaneous eruption That zoster may attack the abdominal viscera is less certain, but Ryle [11] suggested this possibility in a case of duodenal syndrome accompanying zoster in the distribution of the 3rd and 4th dorsal segments, and in the case described by a correspondent on p 822 the colon may well have been involved though abdominal symptoms did not start until a month after the herpetic vesicles appeared The probable explanation of visceral involvement is that the virus travels down the autonomic nerves supplying the viscera, as it is thought to travel down sensory nerves to the skin

These accounts suggest that with obscure neurological disease, and particularly with unexplained localised lower motor neurone lesions, the possibility of zoster should be considered, the mode of onset investigated and search made for herpetic vesicles or their scars

SAVELOYS ET AL.

Of 191 outbreaks of food poisoning in the years 1945–48 whose origin could be traced with some certainty almost half were due to made up or processed meat, the number due to fresh meat was negligible The recently published report [12] of a working party set up by the Minister of Food to consider present practices in the manufactured meat trade and advise on possible improvements in hygiene is therefore timely, and it includes some suggestions of interest to the profession as a whole

The proposals are divided into suggested amendments to the law and regulations and a 'code of practice' to be adopted voluntarily by the trade Manufactures of this kind are regulated by sections 13 and 14 of the Food and Drugs Act, 1938, and it is not surprising that

1 Denny Brown D Adams R D Fitzgerald P J *Arch Neurol Psychiat* 1944 51 216
2 Parkinson T *Brit med J* 1948 1 8
3 Hunt J R *J nerv ment Dis* 1907 34 73
4 Engstrom H Wohlfart, G *Arch Neurol Psychiat* 1941 62 638
5 Krumholz S Lukan J *Ibid* 1945 53 59,
6 Oppenheim H Text book of Nervous Diseases Edinburgh, 1911
7 Dubois F E *J Urol* 1926, 15 583
8 Durget R *J Urol méd chir* 1929 8 62
9 Chesterman C C *Brit med J* 1932 1 563
10 Brain W R *Ibid* p 632
11 Ryle J A *Ibid* p 726
12 Ministry of Food Report of the Manufactured Meat Products Working Party H M Stationery Office 1950 Pp 48 1s 3d

Special Articles

PROVISION OF SPECIALIST SERVICES IN REMOTE AREAS

ROBERT F MACDONALD
M.D Aberd , D.P H.
ASSISTANT SENIOR ADMINISTRATIVE MEDICAL OFFICER, WESTERN REGIONAL HOSPITAL BOARD, SCOTLAND

IN Scotland, particularly in the West and in the North, there are many areas which, because of their remoteness or inaccessibility, present special problems in the provision of specialist services Obviously, if the patient cannot go to the specialist, the specialist must go to the patient, and over the past decade this has been accepted as a guiding principle

For some years before the introduction of the National Health Service, these areas—especially the North-West of the Scottish mainland, and the Western and Northern Islands—had specialist services provided by their local authorities and by the Highlands and Islands Medical Service In some areas the service was already substantial, and in 1948 the over all picture was one of continuous development Fresh ground was being broken, and existing specialist care was being augmented

BACKGROUND AND BEGINNINGS

In these remote districts the local population has only within comparatively recent years become accustomed to turn to the general practitioner for the treatment of minor ailments In the past, a boy might grow to manhood without having seen a doctor within the boundaries of his native parish, unless there had been some disaster such as an outbreak of cholera or of enteric fever To this day much discretion is used before summoning medical aid

The inter war years saw the gradual development, under the ægis of the Highlands and Islands Medical Service, of comprehensive general practitioner arrangements, and by 1939 no area was without regular medical help, though its provision might tax the endurance and resources of the general practitioner to the utmost A visit to a patient was often an expedition to be planned carefully with due regard to local knowledge of weather and tides, and carried out by such varied transport as lifeboats, fishing vessels, and hill ponies Many a good tale lies hidden between the lines of a statement of travelling expenses with such items as so many 'horse," "foot," and "water" miles If the problem of getting to a patient was formidable, that of getting back was sometimes insoluble at least immediately A comprehensive medical service was no new term to these practitioners I well recall one whose habit it was to make a microscopical examination of the cerebrospinal fluid before sending a patient with suspected meningitis to hospital Most of them had to be, and in fact were, first-class general practitioners Of necessity they were themselves the only medical specialists available to the remote areas

In districts where small hospitals were set up the doctors in their vicinity were encouraged to become proficient in some specialty, and in many areas it became customary for one practitioner to undertake all the emergency surgery and also a good proportion of the cold surgery The patient's own doctor usually gave the anæsthetic but here again was an opportunity for a general practitioner to gain recognition among his colleagues for special skill Occasionally, a patient who was fit enough to travel would make the long and tedious journey by road, rail or sea to consult a specialist or to be admitted to one of the large city hospitals for investigation or operation Less often, a specialist would journey to the patient, and perhaps operate in the cottage hospital Medical, surgical, or obstetrical emergencies were seldom moved to the large centres and most of them were treated by the general practitioner at the cottage hospital with the help of one or more of his colleagues

BASIC APPOINTMENTS

The next step in the development of local specialist services was the appointment of a surgeon to strategically situated cottage hospitals This specialist, who held a higher surgical qualification, lived in the area but did not engage in general practice Besides undertaking all the emergency and general surgery of the neighbourhood, including orthopædics and gynæcology, he was usually competent in the management of obstetrical emergencies, and often acted as medical consultant also Anæsthetics continued to be administered by the general practitioners, and such in the main is the practice at present The installation of small X ray sets made still further calls on the versatility of the local surgical specialist Today many of these appointments cannot, and do not, provide full time work, but they are completely justified because the surgeon must be available at all times He is an insurance against medical catastrophe

In assessing the need for specialist services, it quickly became clear that a local appointment could be justified only for general surgery—and that only on grounds of emergency Otherwise the population in any one area was not big enough to provide enough work for a whole-time specialist On economic and professional grounds, therefore, all the other specialist services had to be organised on a part time or visiting basis

The anæsthetic service presented peculiar difficulties The appointment of a visiting specialist anæsthetist is seldom worth while, since much of the anæsthetics work is related to emergency surgery, which has to be carried out at remote places at short notice, and, consequently, most cases are undertaken by one or more general practitioners

The basic problem was solved by appointing to a cottage hospital a competent surgeon, which gave a sense of security to practitioners and people alike Free from the anxieties of general practice, he was able to give his whole time to his specialist responsibilities Regular outpatient clinics were established at the hospital, operating theatre and ward fabrics were improved and equipment was provided More nurses were recruited to deal with the increase in specialised work

The amount of work a surgical specialist can do varies with the density of population in his area Mere numbers are seldom a reliable index, for the ruling factor is always distance, and the sparser the population the more difficult it becomes to make the services of one specialist available to all. In Scotland, where travelling is often difficult, a surgical specialist in a remote area is seldom able to serve a population of more than 30,000, though he may have long intervals when by urban standards he is not hard pressed

The next step in extending the services was the appointment of a part time general medical specialist who visited the area regularly and held outpatient clinics at the cottage hospital to which the general practitioners referred their patients He was also available for consultation in the homes of patients who were unable to attend the clinic How often he went was determined by a process of trial and error Beginning at one session per month, the interval was lengthened or shortened according to the amount of work, which he came to be able, more or less, to estimate Experience has shown that, for a population of 20,000, one whole day is required per month, exclusive of travelling time Apart from acting as consultant, the visiting physician is a valuable link between the remote area and the larger centre at which his major appointment is naturally held During his peripheral visits, arrangements are made for the

patients what seems to be a radionecrotic ulcer on previously healthy mucosa has appeared, both cases had an extremely large dose of irradiation by present standards There have been no cases of urinary incontinence, and the perineal wound has always healed without delay

A team of British workers, generously supplied with radioactive material by the atomic energy plant at Harwell, has been responsible for developing this original treatment It will not be obtainable at every hospital, nor would this be desirable until we know more about the long term results, and it may be wiser if, for the present, experience is concentrated at the Royal Cancer Hospital When used in correctly selected patients, it is clearly a valuable treatment in at least one form of bladder carcinomatosis

HEADQUARTERS FOR POSTGRADUATE FEDERATION

London University is to buy from the Dominion Students' Hall Trust the freehold of a block of property in Bloomsbury, lying on the south side of Guilford Street, on which it is hoped ultimately to build the headquarters of the British Postgraduate Medical Federation It is appropriate that the new site is near London House, where many of the residents are medical postgraduates from the Dominions

ANTIBACTERIAL ACTION OF COD-LIVER OIL DISTILLATE

COD-LIVER oil is known to have a bacteriostatic action, and Solomides[1] has increased this considerably by distilling the oil at 250°C at atmospheric pressure and iodinating the product The distillation is not a simple physical process but is analogous to the "cracking" of petroleum, for the oil decomposes on boiling, some of the long chained and unsaturated fatty acids or their esters being broken down The distillate consists of two fractions—the fatty acids, which inhibit the growth of pneumococci, streptococci, and some fungi, and the unsaponifiable fraction, which is germicidal and tuberculostatic Iodination increases the germicidal activity of the distillate and makes it capable of lysing tubercle bacilli Admixture with serum and body fluids does not affect its action on tubercle bacilli but weakens its germicidal action Solomides has made the distillate injectable by means of emulsifying agents, such as Tween 80,' and the emulsified product is said to be practically non toxic and not liable to cause local reactions Solomides reports good results with local applications of the iodised distillate in 50 obstinate cases of eczema, and in patients with burns and mycoses, but he does not mention any control observations The product's tuberculostatic action was confirmed in guineapigs, though the differences between treated and untreated animals was not spectacular The dosage had to be judged very carefully, for the infected animals improved when treated with 0 01 g of emulsified iodised distillate daily for a month, but double this dose seemed to hasten their death from tuberculosis The intradermal tuberculin test gave a negative or feebly positive result in tuberculous guineapigs which had been injected with 0 001 g of distillate daily for 3–4 weeks Work on the same lines has now been reported by Emmerie and his colleagues,[2] of Utrecht, who have found the unsaponifiable fraction strongly tuberculostatic in vitro but disappointing in vivo when tested in guineapigs Solomides' clinical results with injections of the distillate in tuberculosis are not impressive He does not mention the total number of patients treated, the radiological appearances, or the changes in erythrocyte sedimentation rate Some patients had a pyrexial reaction shortly after their injections and Solomides suggests that this arises from the liberated tuberculin of dead bacteria

On the present evidence this cod liver oil distillate is of more academic than clinical interest It has yet to be shown to have any beneficial effect in human tuberculosis, and the guineapig tests show that it is a double edged weapon, since increasing the dose may exacerbate the infection In local treatment it does not seem to have any advantages over the antibiotics

1 Solomides J *Ann Inst Pasteur* 1950 78 227
2 Emmerie A, Engel, C, Klipp, W *Nature Lond* 1950 166 78

CAT-SCRATCH AND TULARÆMIA

HUMAN infection with *Pasteurella septica* is now a recognised sequel to bites by cats and other animals which carry the organism in their mouth or respiratory tract Such infections usually have a sudden onset with swelling and redness of the injured area followed by a benign course, but sometimes the inflammation persists a long time and osteomyelitis may be discovered after the initial lesion has healed

Cats are thought to be the source of another infection, known in France as "*la maladie des griffes de chat*" Debré and his colleagues,[1] who have seen several cases, describe an example in a girl of six, who developed a small tender swelling in the groin without any other lesion in the limbs or perineal region Despite treatment with penicillin the lump grew and the skin over it became discoloured and adherent Aspiration produced pus, from which no organisms could be grown on the various culture media tried The girl's Frei and tuberculin skin tests were negative, but an intradermal test with an antigen prepared from the pus of a similar case was strongly positive The abscess discharged for some days but responded fairly rapidly to 'Aureomycin' The child had no history or sign of claw marks, but she habitually played with cats at home This case is typical of many seen recently in the country round Paris The lesion is a subacute suppurative lymphadenitis involving one or several nodes and leading to an abscess which may reach 2–3 inches in diameter There is little general reaction except for mild fever and sometimes a leucocytosis, though Weill and Lévy[2] have noted enlargement of the spleen in one case

This condition seems to be distinct from the infections with *Past septica*, but so far bacteriological and mycological examinations have not revealed its cause Viral infection is a possibility, especially as cats and mice are often infected with viruses of the psittacosis lymphogranuloma group Another explanation is put forward by de Lavergne and colleagues[3] in their clinical review of the first epidemic of tularæmia in France They point out that cat scratch infection resembles one of the varieties of tularæmia, and the skin test antigen prepared from cat scratch pus has produced a positive reaction in several proved cases of tularæmia It is known that cats occasionally harbour *Past tularensis*, but in the case reported by Debré et al the child's agglutination test for tularæmia was negative Application of this test in other cases of cat scratch should quickly determine whether the two conditions are related

CHRISTMAS

AT a time when the rise of prices makes it harder and harder to make ends meet, the Christmas gifts which the Royal Medical Benevolent Fund sends to its beneficiaries are more welcome than ever Contributions, marked Christmas Gifts, will still be gratefully received by the fund at 1, Balliol House, Manor Fields, London, S W 5

1 Debré R Lamy M Jammet M L Costil L Mozziconacci P *Bull Soc méd Hôp Paris* 1950 66 76
2 Weill J Lévy P *Ibid* p 907
3 de Lavergne V Pierquin J Hellay J Dornier, R *Sem Hôp Paris* 1950 26 3978

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The threshold of demand for a mental health service, certainly in the less obvious cases, is higher in these rural areas—possibly because of environment—than in the more populous centres Few remote areas have enough work to justify a regular psychiatric service on a visiting basis There is usually a well established liaison with a district or city mental hospital, but only too often this is regarded as merely the receiving hospital for certified cases Domiciliary visits by psychiatrists wherever and whenever possible should be encouraged to promote closer contact between the mental hospital and the general practitioners

Patients who need plastic surgery and neurosurgery should be referred to a central unit after screening by the local services The work of the visiting physician will of necessity include pediatrics, cardiology, and possibly diseases of the chest, but he should be able to refer suitable cases to the appropriate central departments Patients with venereal disease should be persuaded wherever possible to accept inpatient treatment at a central unit, returning later for continuing treatment by the general practitioner on a programme mapped out by the specialist

Finally there must be available to general practitioners and visiting specialists a complete laboratory service including bacteriological, pathological biochemical, blood transfusion and saline infusion facilities Between the central laboratory and the peripheral area there should be a ready line of communication by post, telephone, and telegram

CONCLUSIONS

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In reviewing or planning the hospital services of a remote area, I would stress the importance of developing first and foremost local outpatient facilities within the small general hospital, even at the expense of local inpatient accommodation Increased outpatient facilities, and an increase in the number of beds for the chronic sick and long term illness and tuberculous patients together with a full visiting specialist service, and an adequate number of beds at the appropriate central hospital units, should be the pattern of planning for the immediate future There are many areas in Scotland, and no doubt areas in England and Wales, to which these principles could properly be applied

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The latest Bill (HR 8746) was introduced as recently as June, 1950 It proposes to set up a Federal Health Reinsurance Corporation By reinsuring the heavier losses for health insurance its proposer believes that it will be possible for local Blue Cross Blue Shield, and other voluntary plans to give more attractive contracts to subscribers at a reasonable charge which, in the words of the proposer, 'should cover the medical economic problem of the nation within a brief space of time without the necessity of bringing the government into the patient-doctor or patient-hospital relationship" The government's contact with the proposal would be confined to the local non-profit insurance associations Initial financing of this plan would be by a $50,000 000 Treasury appropriation in exchange for capital stock. Each eligible health insurance plan agreeing to participate would pay in premium charges 2% of the total gross payments received from subscribers The corporation would pay two-thirds of each claim above $1000 paid out by the plan for any period of 12 continuous months with respect to any individual subscriber Prepayment plans would thus relax contract limitations and offer broader coverage, knowing that the government would assume financial responsibility for two thirds of the sum spent in excess of $1000 in catastrophic cases

S1679 is the original Wagner-Murray-Dingell compulsory health insurance bill It provides for simultaneous enactment of a separate tax bill to levy a 3% payroll tax divided equally between employer and employee The income from this tax would be put into a government trust fund An additional 1% would be put in from the federal Treasury This trust fund would be administered by a National Health Insurance Board of five persons, including the surgeon-general of the Public Health Service and the Commissioner for Social Security The board would divide the trust fund among the States by mathematical formulæ based on comparative need cost of services and other factors, the allocation being in five main categories (1) medical (2) dental, (3) nursing, (4) hospital, and (5) auxiliary services such as pharmaceutical and radiological The Bill makes no provision for indigent persons unless the local communities responsible for them pay premiums into the federal fund An American authority remarks

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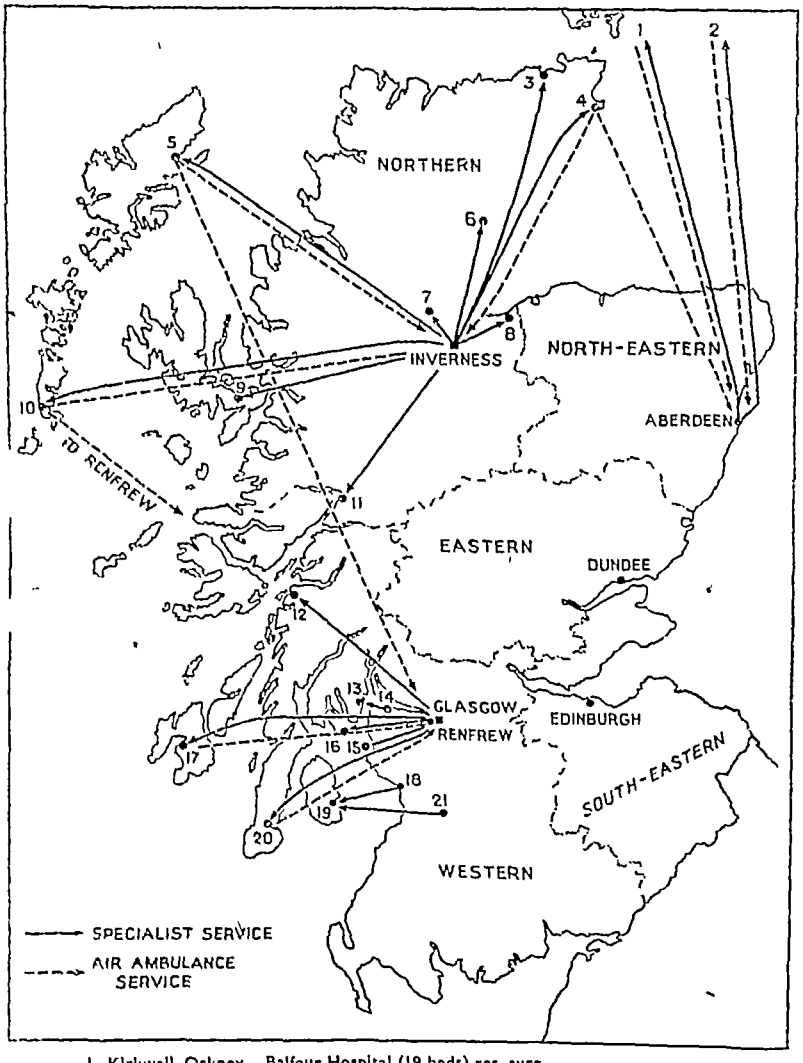

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(The bed figures are those given in the Scottish Hospital s Survey 1946)

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The success of these services soon called for further developments An orthopædic service, for example, must now be regarded almost as an essential, and it requires one visit or clinic session every two months per 20 000 of population Here again, a sufficient number of beds must be reserved in a central orthopædic unit to honour recommendations for in patient treatment without undue waiting

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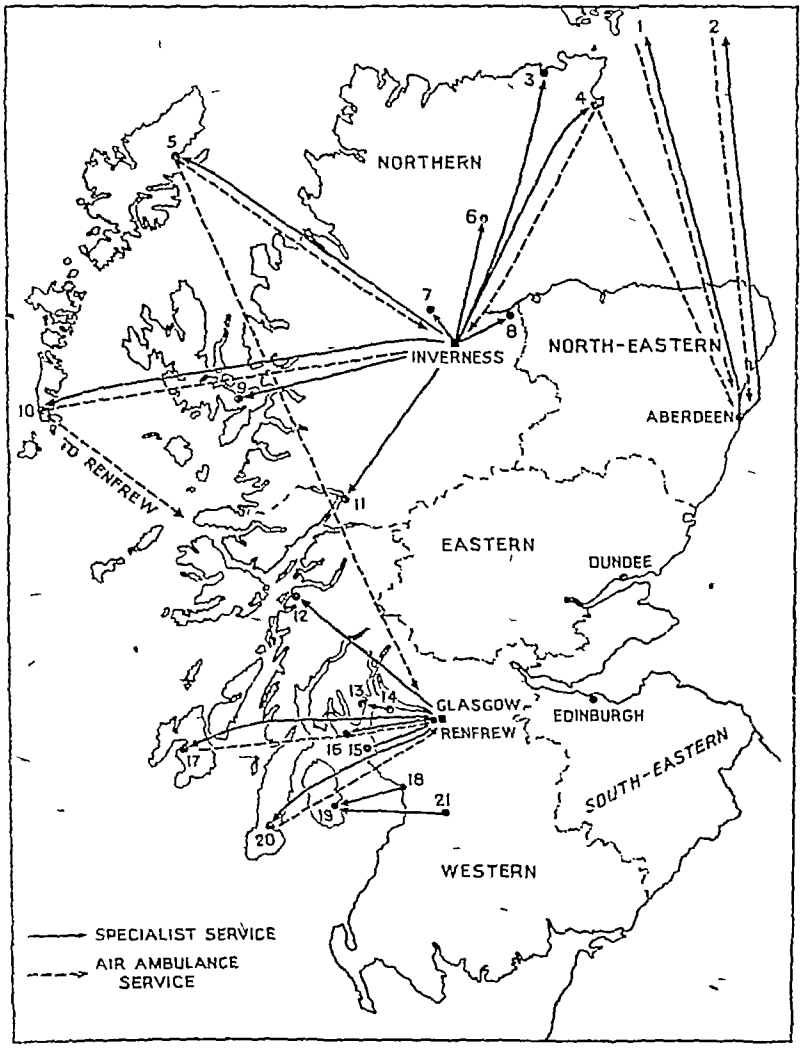

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MEDICAL LEGISLATION IN NEW ZEALAND

FROM OUR NEW ZEALAND CORRESPONDENT

Two Acts of medical interest have been passed in the 1950 session

Medical Research Council Act, 1950—This incorporates the M R C, which has been in existence since 1937, in order to assure continuity of medical research and permanent conditions for research workers It is hoped also to attract endowments and bequests to assist in medical research.

The membership is to include the director general of health, the permanent secretary of the Department of Scientific and Industrial Research, the dean of the medical faculty in the University of Otago, a series of nominees to be appointed by the minister from the B.M.A. board of health N Z committee of the R A C.P and R A.C S and Royal Society of New Zealand and two from the Senate of New Zealand University recommended by its academic board

The functions of the council are to foster medical research, to publish reports, and to furnish advice It may make grants to individuals colleges and institutions from a fund to be vested in the council Any discoveries made by officers of the council or by those working under its support are to be the property of the council

These provisions mark a major step forward, and follow soon after the visit of Sir Henry Dale and others whose advice the government sought During the discussion of the Bill in Parliament, strong representations were made on the importance of dental research The minister (Mr J T Watts) announced that it was planned to appropriate £33,000 from government funds this year, as against £21,000 last year This was in contrast to the total sum of £25-30 million spent last year in toto, on the health of the community

Medical Practitioners Act, 1950—This consolidates previous Acts relating to registration and discipline, and adds a number of new conditions, chiefly those recommended by the Cleary report of 1948 on discipline under the Social Security Act [1]

The Medical Council remains much as before in constitution and powers, and becomes a higher court in relation to the disciplinary committee It consists of seven members the director general of health the dean of the medical faculty, and five practitioners appointed by the minister one on the recommendation of the B M.A. Its powers are fine up to £100 suspension from practice up to twelve months with consent of the attorney general and a motion to the Supreme Court to remove the practitioner s name from the Register A new variety of registration is introduced (to be effective at a date to be gazetted)—conditional registration for recent graduates to be confirmed as registration after a period of internship or other service similar to that which is to be required in England Reciprocity with other countries remains as before

Within the profession discipline is vested in a Medical Practitioners Disciplinary Committee and in divisional disciplinary committees All the members of these committees are medical men, and almost all are to be appointed by the B.M.A. Their scope is professional misconduct, short of grave impropriety or infamous conduct in a professional respect which is the concern of the Medical Council The powers of the disciplinary committee are subject to appeal to the Medical Council, and include a fine up to £100 censure or order to pay costs and expenses

Dietitians—Also passed in the 1950 session was a Bill to further the knowledge of nutrition and dietetics and to provide for the training and registration of dietitians under the Dietitians Board

Qualification for registration is defined by regulations and power is given to the board to approve hospitals and other institutions as training schools Registered dietitians are to have annual practising certificates and hospital boards may appoint only registered dietitians The board has disciplinary powers over registered dietitians subject to appeal to a special magisterial board of appeal The uniform and title 'dietitian' are protected under the Act

1 See *Lancet* 1949 II 855

NATIONAL SERVICE FOR DOCTORS

THE Central Medical War Committee has been notified by the Ministry of Health that, with effect from Dec 1, registered medical practitioners who are placed in grade III or grade IV by National Service medical boards, provided that they are considered suitable for employment in the Armed Forces are to be regarded as available for National Service in the same way as doctors in grades I and II

It is not at present proposed that this should be applied to doctors who were placed in grade III or grade IV before Dec 1 and who may therefore have been officially informed that they were outside the field for call-up Doctors graded III or IV by National Service medical boards on or after Dec 1 cannot assume that they are unfit for National Service unless and until they are so notified by the Central Medical War Committee

This change in the recruitment arrangements for doctors, which has been approved by the Central Medical War Committee, is necessary in view of the present shortage of medical officers in the Forces

The Wider World

A VISIT TO GERMANY

FROM A MEDICAL CORRESPONDENT

A VISIT to Germany nowadays may be one of many things A holiday of pre war kind, with reservations and limitations, a visit to Oberammergau to see the Passion Play, or a visit either on business or politics or to the Occupation Forces or the Control Commission It was to this last group that mine belonged the Army and the Royal Air Force plus the Control Commission were my objectives

Judging by my experience, the average speed of military vehicles on duty is round about 50 miles an hour But the chief danger of such a visit lies in the overwhelming hospitality of all concerned, and the chief surprise (speaking broadly) is the good conditions in which members of the Occupation Forces live

CHANGES AND DIFFERENCES

When, in 1945, I visited Germany for the first time after the war, the streets of Berlin were heaped with the debris of shattered buildings the Chancellery was as easily accessible as the Nelson Column, and curios could still be picked out of the ruins And while the black market flourished along the main boulevards, night life flourished in underground cellars A gun (in the gangster sense) was flourished at my back as I talked with senior officers in the Press bar, and I saw two victims of casual shootings, both members of the Army

That kind of thing has vanished, and, as far as the Services and the Control Commission are concerned the background of life is more like that of an Indian station, in the days of British rule in India than anything else I know But the work done in the Occupation Forces is just as hard as that of hard working men and women in this country, and the hours are often longer Since 1945 this work has helped to change the whole scene The food shortage once so acute has been overcome, hospitals are working, industries are working long-distance trains are working and so are local train and tram services in the big towns Nevertheless there is still unemployment, which is reflected in the ease with which domestic assistance is obtained

Travelling in the British zone (which is about as big as England and Wales) one sees many differences between Germany and Great Britain, and some of them are unexpected The countryside I saw was very well cultivated, but for the most part was in small fields

The Flanders Ives Bill (S1970) is patterned along the lines of the Health Insurance Plan of Greater New York, which hires its own staff physicians to care for its members and purchases hospital care on a group basis Loans and grants would be provided to start such plans in communities and areas all over the nation, enrolment would be voluntary, and the premiums would be on the basis of a percentage of the family income A national "yardstick" would be established, listing all the services that should be rendered by an ideal plan, and in each State the State agency and health council would establish a norm This norm would indicate the cost of providing "yardstick" services in the State, and each community plan providing all the services listed in the national "yardstick" would be entitled to the State established norm for the services provided to each subscriber If the subscriber's income were so low that his contributions, based on a percentage of his income did not reach the norm, the plan would receive a subsidy from State and federal funds Opponents to this Bill say that it would be harder to administer than the compulsory health insurance Bill as, in both, doctors and hospitals would be under pressure to provide their services for prices beyond their control, and not every hospital would be able to provide its usual quality of care at the government-established norm On the other hand proponents of the compulsory health insurance Bill believe this alternative to be the next best thing to their own Bill, one reason being that it requires a majority of the members of governing boards and community plans to be persons who do not furnish health services

Another Bill (S1106), sponsored by Senator Lodge, proposes that the federal government should pay half the cost of State programmes to provide "certain medical services and medicines, which are standardised in their nature but which, because of their high costs, are not used in many cases in which their use is desirable" Medical aid would include radiological and laboratory diagnostic services, respirators, and drugs The State would be required to participate financially, and the surgeon-general of the Public Health Service would allocate funds on the basis of demonstrated need To those who believe that the distribution of health services can be solved by making health care less expensive, this bill has had considerable appeal

Senator Hart, a dentist, sponsors Bill S2940 This is based on the belief that his professional colleagues must be more liberal in their approach to federal participation in the distribution of health services His concept is a voluntary health-insurance plan operated by the federal government to pay all health-care expenses over $5 a year for families with incomes under $5000 Premiums and policies are to be established by a National Health Insurance Board of five members including the surgeon-general of the Public Health Service, who would represent the medical profession, representatives of hospital and dental associations, and two representatives of the general public The entire responsibility for subscription charges, benefits, and administration would be handed over to this board The Bill also proposes to establish a Department of Health, grouping under it all of the present health functions of the federal government

The Taft Bill (S1581) proposes federal grants-in aid to State devised programmes to make medical, dental, and hospital care available to persons unable to pay the whole cost The Bill does not specify the method by which this could be achieved In his own words Senator Taft says "I suppose my Bill would help a State programme of compulsory health insurance if the State wants it But this is for the State to decide The federal government should not impose an arbitrary pattern" The Bill offers general assistance (up to 25% of the cost of the State programme) for development of voluntary non profit health insurance plans, establishment and staffing of diagnostic facilities and inducements to physicians and dentists to practise in low income areas

S1456, the Hill Bill (known also as the Voluntary Health Insurance Bill), aims to encourage all self supporting people to use voluntary health insurance, such as Blue Cross, for protection against the emergency cost of illness. It requires federal and State governments to permit payroll deductions for employees wishing to enrol in non-profit prepayment plans, and it would assist States in programmes to discover how the government might assist in extending voluntary health insurance rather than trying to undermine it Persons unable to pay subscription charges for voluntary prepayment plans would be provided with unidentifiable cards or certificates which would entitle them to the same care as self supporting citizens Claims in these cases would be identified only by contract number, and the cost of such care would be borne by the federally assisted State programme The assistance aspect of the programme would be supervised by the government agencies, but the voluntary health insurance programme for the great majority of self supporting people would be left entirely free of regulations and would be stimulated to the fullest possible extent This Bill also provides for (1) surveys of existing diagnostic facilities (2) surveys of areas unable to attract doctors and dentists because of low income, (3) surveys of existing enrolment in voluntary prepayment plans, (4) payment of non-profit health insurance premiums during periods of unemployment, and (5) financing of long term care

Under another compulsory health insurance Bill (HR6766), sponsored by Representative Mrs Bosone, benefits would be payable on a "$50 deductible" basis—that is, when a participating citizen has paid $50 in medical care (including hospital care), or $25 for dental care, the federal administration "shall pay the balance of the charges for services so furnished" The Bill would be financed by a 3% payroll tax on earnings up to $3600 a year with an additional 1% from general tax funds as in S1679

HR7418, sponsored by Representative Boggs is an ingenious scheme It would modify the present federal income-tax law (which permits deductions of medical expense in excess of 5% of gross income to determine taxable income) as follows if a taxpayer has a gross income under $2000, he can deduct all of his *medical* expenses, for an income between $2000 and $4000 the deduction would be the excess over 1% of the gross income, from $4000 to $6000 it would be 2%, and from $6000 to $8000 it would be 3% from $8000 to $10,000 the deduction would be the excess over 4% of the gross income, and over $10,000 it would be 5%

HR6819, sponsored by Representative Keating, is also concerned with income tax and medical expense but in a radically different way If gross income is over $2000, this Bill would permit 90% of health insurance subscription charges to be deducted from the tax itself For income between $2000 and $4000 85% of the health insurance subscription charges would be deducted from the tax For income between $4000 and $6000 the deduction would be 80% between $6000 and $8000, 75%, and between $8000 and $10,000, 70% For incomes over $10,000 the deduction would be 60% The Bill would put the federal government in the position of paying a large portion of the health bill of the nation Only approved health insurance subscription charges would be qualified, thus leading to some measure of federal control, and income tax would have to be increased to allow for the additional expense A criticism of both HR7418 and HR6819 is that many of the citizens who most need relief on medical expense do not file income-tax returns

The above are the major health proposals facing the present Congress Some of them, it is pointed out in *Hospitals*, have a familiar ring about them, others are recent and the point is made that this is encouraging as indicating that legislators are not becoming stagnant in their thinking The change seems to reflect a growing optimism—a reaffirmation of faith in the voluntary system It is no longer a question of "compulsory health or nothing" Rather is it a choice of several methods and a seeking for workable schemes

Disabilities

56 CEREBRAL PALSY

My problem is to behave normally, being equipped with arms and legs which move in any direction I choose, but which are likely to move in a series of jerks and also to move themselves when I am only to sit still Recently the condition has been described to me as athetoid quadriplegia, but in my childhood no definite diagnosis was made and no treatment prescribed except for a brief course of massage in my third year

My first attempts at solving the problem were not made with any conscious effort, although probably they were much influenced by my mother's guidance I began to walk with my feet wide apart just before I was two Though very liable to fall over, I was in a position to investigate life I followed my mother about the house, and like every other child I began to learn by imitation and repetition I would stress repetition I knew perfectly well what I aimed to do, and I was convinced that if I tried often enough I should succeed Fortunately that initial confidence has never left me

I had seen my mother sewing and demanded a needle and thread for myself. She did not care to entrust a needle to my unsteady hands but gave me a bodkin I regarded this as an unworthy tool Having watched me with it, my mother decided that I was not, after all, likely to damage myself much, so I got a needle, and a pair of scissors as well My cutting might be jagged, but I almost always accomplished the movement I intended, however waywardly Even if I did lose control of a movement I was able to stop and so save myself from harm It seems to me that severe accidents are more likely to befall normal people, who naturally neglect the one in a hundred chance, than those with cerebral palsy, who have their greater risk constantly in mind In twenty eight years I have cut, burnt, and scalded myself but neither more often nor more seriously than a normal person

I succeeded in sewing and in knitting by keeping my knees together, to give a firm base for operations, and resting my hands on them Similarly, I typed and played the piano by dint of keeping the edge of my palm and my wrist on the frame of the typewriter or the border of the keyboard If my hands rest somewhere I can use my fingers easily, but if I hold up both hands in front of me—the normal posture in sewing—I cannot make a movement of any accuracy An improved action has often meant a more normal looking movement and posture, but unfortunately it has sometimes also meant increased muscular tension Tension did in fact increase to the point where I remained comparatively still when not attempting to move and not embarrassed or under strain Thus, when first made to relax, I was surprised by the extent of my involuntary motion in repose

My mother soon realised that I must learn to meet people and transact naturally the day to day business of life In early childhood my speech was hardly intelligible to strangers, but as soon as it improved a little she forcibly broke herself of the habit of answering for me and I had to make polite conversation to our various acquaintances I was also sent into shops to ask for this or that with my mother remaining doggedly beyond call

I have often wondered in retrospect at my mother's self control in letting me experiment slowly and clumsily with this and that when her impulse must have been to do these things herself quickly and safely To that restraint I owe incalculably much By the time I was four I was walking rather more steadily and was taking part in mild rough and tumble with other children From imitating my mother I passed to imitating them, older and younger children might now and then look askance at me, but I was always at ease with my contemporaries who accepted me with as little question as they did the rest of their environment Gradually I walked with my feet closer together, and I remember walks punctuated by my mother's injunction to keep my knees back, for they tended to be slightly bent For some years my head shook noticeably as I walked, but latterly that has subsided I have been shown that my leg muscles are stiffer than they should be, and I try now to correct this tension, but walking causes me neither fatigue nor embarrassment I can cover as much as fifteen miles in a day without discomfort

At six years old I went to a small preparatory school, its chief virtue was in having few rough boys whose boisterousness might upset my precarious balance Here I met for the first time one of my most stubborn problems —how to control my hand enough to write When, at the age of nine, I went to a secondary school I could only write standing up and very slowly Using a pen brought me almost to a standstill, so I wrote my entry papers in pencil My admission probably determined all my subsequent life Once and for all I was in the main stream, without time or inclination to regard myself as one apart One or two of the staff tried to kill me with kindness, but the majority merely saw that I had reasonable ability and were anxious that I should make the best possible use of it I was excused nothing except games and apparatus work in the gymnasium Looking back, I am a little surprised by my own docility One of the trials of my life was a weekly slip test—one word answers to grammatical questions written on a slip of paper some two by seven inches which I found most difficult to anchor and write on at the same time It never occurred to me to ask for a larger sheet There was also my history notebook in which, as a weekend task, rough notes were transcribed with all the niceties of indentation and red ink underlinings To compass half without blot or smudge was to increase the agony of concentration lest I should mar the rest All of this was done standing up If I sat down and bent my elbow, I lost control of my hand I wrote virtually with my whole arm I realise now that trying to attain the accuracy and neatness expected of the average child greatly added to the tension in my muscles However, for the mental discipline of those years I shall always be grateful

When the rest were due to take school certificate I was asked if I wanted to enter I answered Yes, and permission was obtained for me to write in indelible pencil, any time concession was, I learnt, out of the question The examination was a race between me and the clock, my only hope was to start writing the moment I had read the question In the event I had a "credit" for each of the seven subjects I had taken Throughout the rest of my school career 'credit" standard was usually the limit of my achievement, dependent as it was on the speed of my writing After taking school certificate I resolved to write no longer standing up I made myself sit down and found that by thrusting my left hand beneath my right I could control my hand, even though I had a permanent bruise through my fore arm rubbing against the edge of the desk It was not better than standing up, but it looked better

At eighteen I left home for the first time and went to college I had mastered two or three years earlier the last item of my toilet—waist long hair to be brushed, plaited, and coiled Other girls were more than willing to do the few things I could not, such as carrying buffet meals to table Even now to be quite sure of not spilling from a cup, I either lift it with both hands or, less conspicuously, grip my right wrist with my left hand For me, as for most undergraduates, academic work was only a part of life I danced—not very well, I admit—had a hand in the college magazine, and debated The days of indistinct speech were behind me, and I did not have

separated by stakes and strands of wire The fields were as a rule so small as to make the use of most agricultural machines impossible and probably in any case uneconomic The peasant with his hand hoe dominated the scene—sometimes a man and sometimes a woman Very many chickens and geese were to be seen, and I was told that the poultry population was greater than it had been before the war But during all my drives, including long distances on the autobahns, I only once saw an agricultural machine, and that was an early-model reaper and binder

Another aspect of German farming which impinges directly on health is dairying Cows are milked in the fields by the probably honest, but apparently usually unwashed, hands of the peasant, and the proportion of tuberculous cows is very high indeed (For this reason no German milk is issued to British personnel, who get their milk out of tins *) On the other hand, statements that the incidence of tuberculosis is very high in the German population are not supported by the death rates, which do not correspond (our authorities found) with the alleged prevalence A possible explanation lies in the fact that during the food shortage after the Armistice tuberculous patients, and presumably suspects, were entitled to higher rations As ration scales went up, the apparent incidence of tuberculosis has gone down Changed economic conditions have also worked other health changes In 1945, at the time of the black market boom, when German currency was of very little value, the incidence of venereal diseases was very high But this desperate state of affairs has passed The cigarette is no longer a form of currency, and has got back to its pre war position in the slot machine—a device which, some readers may remember, used to operate at reasonable prices in our own country

THE MEDICAL PROFESSION

The organisation of doctors in Germany is on a basis of provinces (*Lander*) In the British zone there are three of these provinces—Schleswig Holstein, Lower Saxony, and North Rhine Westphalia The German doctors in control of these provincial areas have powers which are partly official and partly derived from the professional organisation it is a kind of compromise between a regional and a B M A organisation The cost of the organisation comes out of occupation costs, paid by the Germans, and supervised carefully by the High Commissioner's staff

Some German members of the staff of the provincial organisations told me that there were large numbers of doctors in Germany unemployed They would be willing to emigrate, but for service as doctors in such places as the British Dominions and Colonies they would need to speak, read, and write English, and not many of them can do this It is also very doubtful whether the Dominions would take them in Australia, which has been encouraging the immigration of Germans into her territory, is willing to accept German doctors as individuals—but not to accept them as doctors Even this might attract some German doctors, for I heard of some of them being employed on farms in Germany Lack of knowledge of English restricts the possibility of their employment by the Control Commission or the Armed Forces in Germany, though some of them work with the troops as civilian medical practitioners Differences in their method of work and in their approach to patients also present difficulty On the other hand there are men in Germany of high reputation in their specialties who could render valuable service as consultants

Among the many people I met in Germany was a small group of German doctors, some of whom had recently been to England to study our methods of training and employment of sanitary inspectors I was told that if you ask a German whether his town employs sanitary inspectors he will say Yes But he means only a man who clears the drains The work of the British sanitary inspectors as a part of the health service was a revelation to the German doctors, for they did not know how much valuable work can be done by the kind of friendly and ubiquitous official we have in this country

RECONSTRUCTION AND THE OCCUPATION

At the end of the war the displaced persons' problem in Germany was very large and very grave Now it has shrunk to a much smaller size, and it is in theory to disappear next January when all D P s who remain in the camps (because they have refused to return to their countries or to emigrate) will automatically become German citizens But there is still a stream of refugees coming from Eastern Germany into the West, and these people present a problem not yet solved, especially as there is still much unemployment in the big towns of the Ruhr and elsewhere

Signs of the bombing of Germany's towns and industrial establishments are to be seen everywhere There are new buildings—some of very poor quality, erected very quickly—but it has not yet been possible to undertake anything like the rebuilding seen in London and other blitzed areas here The destruction was, of course, far greater in Germany

During this time of cold war, it is strange to find conditions so quiet and orderly in Berlin. One can drive through the city from the British to the American or the French or the Soviet sector as freely as in London —indeed much more freely, because there is very little motor traffic The only difference is that anyone who goes into the Soviet sector must be ready to produce his identity card or passport at a moment's notice Women employed by the Control Commission or Services and wives of Servicemen, habitually go into the Soviet zone to the theatre and ballet, which are excellent

For the families of British personnel, life in Germany is pleasant, and Berlin is one of the most popular stations, because of sports and musical and theatrical attractions In places other than Berlin, the British often have to live at long distances from their place of work some families are quite isolated and depend in emergency on German doctors and German hospitals The general feeling towards them is reasonably friendly In many parts of Germany there is little hostility towards Britain, and in Hanover the suggestion has actually been canvassed that the ancient link with England should be renewed by a member of the British Royal Family assuming the old Hanoverian throne

One interesting development in Germany has arisen from the association now permitted between troops and civilian Germans Some of the young soldiers have wished to become engaged and to marry Germans, and a number of marriages have taken place In a large proportion these are said to have proved successful, and perhaps some of the credit should go to the method used by the Army and Air Force in dealing with applications for leave to marry First an official request has to be made, and this in itself has an effect on the man who makes it Secondly, if the man has not recently been on leave, he is sent on leave before a decision is made, and this sometimes causes him to change his mind And thirdly he has the opportunity of discussing the question of marriage with an understanding and well informed superior This cautious approach is salutary, and civilian society in England might well adopt a similar procedure

* American troops stationed in Britain during the late war received their milk from the United States because no reliance was placed on the safety of British milk —E D L

surprised to see some blue blotches on the right dorsum My surprise turned to mild dismay when I looked closer and found that the blotches looked like purpura As far as I knew, 'X could not have had this effect It was also odd that there seemed to be no similar lesions elsewhere and my imagination now taking over I decided that the colleague who had administered 'X' might have put it by mistake into an artery

Still dubious I walked over to the ancient monument whose steps we run up and down I took off my jacket—and then put it on again and went back to the ward-round where I thrust my right hand at the professor, asking "Is this purpura?" "It certainly looks remarkably like it," he replied and then put on his spectacles and looked with some care Finally he delivered judgment. This, he thought was not purpura although the lesions resembled it and it would be quite safe to run to exhaustion I retired slightly discomfited and as I went, I heard one of the junior members of the unit make a remark which would have driven me to run myself silly even if the professor had thought it unwise In a pedantic voice amid laughter from the rest of the unit he declared The lesions have the characteristics and distribution of senile purpura'

* * *

We peripatetics are careful to disguise our individuality, but we offer points of interest as a group and I have begun a preliminary classification First there is the peripat—the bluff friendly, down-to-earth country G P whose practice consists of countrymen with a fund of earthy knowledge of practical medicine He speaks for a return to dock leaves and foxglove and he rather disapproves of the cold comfort of modern techniques. Then there is the peripateticist who is very different He writes accurate but somewhat dry accounts of international meetings There are also the peripatechnicians and peripatetologists, who are always experimenting with things like trombones and L.P.s We must not forget the peripathetic correspondent who is bullied by his wife, his patients and the executive council, and who makes anonymous faces at Mr Bevan from under the Editor's cloak. And for all I know Mr Bevan himself wields a peripateticeltic quill I strongly suspect that I sometimes see a peripateditorial comment which is too ebullient to appear elsewhere in this journal

* * *

The newcomer to general practice however well trained and conscientious must expect some snags if he starts his assistantship in a Derbyshire colliery town For example at evening surgery a tough miner walks in and when I ask what his trouble is his answer sounds like I want a lodjorge" A what?' said I A lodjorge he repeated, with an impatient frown "double L OY D GEO RGE. This still did not enlighten me so he got down to monosyllables I want to go on t club But being a doctor of post-war vintage I was unenlightened so I consulted the head of the practice After briefly reviewing the history of health insurance in Great Britain he explained that up North Lloyd George is looked on as the permanent head of all State insurance schemes, so they call all health certificates after him. The phrase, 'To go on t club, is merely the jargon of friendly society days for 'to go sick" Quite simple when one knew the answer But when next day a man with a crushed toe asked to go on compo though this sounded to me like a kind of stewed fruit, I applied to my employer at once without first exposing my ignorance of the Workmen's Compensation Acts

* * *

'Tea garden
Bear left
—So ran the notice Eager and athirst
Thither we speedily inclined
Our faltering steps only to find
A sharry load had got there first.
Leaving behind
A bear garden
With no tea left.

* * *

As a seasonable gesture of good will to our statistician, Dr R has promised to stop referring to his adjusted data' as cooked figures"

Letters to the Editor

STUDY OF DELINQUENCY

SIR—The violence of the psychiatric onslaught upon me in your recent correspondence columns has set me wondering Can it be that I have touched a tender spot? Dr Paul Reiwald the well known criminologist, has suggested that society needs the criminal as a focus for its guilt-feelings Am I the felon upon whom psychiatric guilt feelings are being released? If so, the only psychiatrically respectable thing to do is to get at the cause of the guilt And if I were allowed to indulge in a little diagnosis, I would suggest that this lies in the false position of the psychiatrist as such in the modern world The short period of study hitherto required for his diploma is a quite inadequate training for the social responsibilities which he is called upon to undertake Meanwhile our menacing "maladjustment" problem is virtually untouched, and will remain so until we have an adequate supply of social practitioners trained on realistic lines The tradition furthermore, that the treatment of "mental illness" demands full medical qualification means that this supply is being artificially limited

This social maladjustment of the psychiatrist is an historical commonplace it is a re enactment of the struggle of the medieval guild against the new class of artisan, of the hand loom weaver against the new manufacturing techniques and of the craftsman engineer against "dilution" It is in accordance with historical expectation then that many psychiatrists will fight to maintain their craft position and that those who advocate new techniques and a more realistic training will be the subject of their attacks

Matters have been brought to a crisis recently not only by the deterioration in the nation's "emotional health," but also by the revolution in our knowledge during the last ten years (under the leadership be it admitted of the progressive wing of the psychiatrists, to which I have acknowledged my debt elsewhere) The object of my paper (Nov 25) was to make some suggestions for the development of the new techniques rather than to denigrate psychiatrists as a class And if I have created the wrong impression I hasten to correct it Were I however to shirk a frank statement of the position for fear of treading on corns I should be failing in a social duty It is a melancholy fact that we are at present allowing the personalities of many children to be so damaged that they are destined to become if not delinquent at least unhappy and unpleasant people who will create still more unhappiness both around them and in the next generation Of the 90 delinquent youths of whom, in my recent study[1] I could obtain data about childhood no less than 62 had shown gross symptoms of maladjustment or unadjustment before their tenth year Nothing effective was done about them and indeed very few of them had had any contact with a clinic at all Dr Edelston's (Dec 9) optimism about the spotting of the unhappy child is not justified

There are many points in Dr Bodman's letter (Dec 2) which tempt me to reply but for reasons of space I must limit myself to his main taunt Far from my generalisations being based on 'a few particular instances' or upon inexperience, as he suggests I have been in a unique position to assess the validity of a fairly representative cross section of psychiatric judgments I have in fact been able to read a large number of psychiatrist's reports upon delinquent youths of whom I could subsequently make a detailed long term study Not wishing to exacerbate interprofessional differences I only quoted

1 Delinquency and Human Nature Dunfermline 1950

much difficulty in speaking to an audience Rather, I was liable to find myself in ordinary conversation shouting some isolated and trivial phrase without intending it Gradually I trained myself to keep pitch and volume level, and was then criticised for having a monotonous voice

When my final examination was in sight I realised that if I wrote my papers as I had at school their brevity would condemn me to a third class Permission was given for an amanuensis to type my papers I had begun to type myself in my last years at school, but was not yet sufficiently proficient to manage examination papers A first came as a surprise despite all my scheming to secure it For the next two years I did research

I came home with qualifications which would have sufficed to procure a job for a normal person I had to discover a job in which my handicap would not hinder me, and then persuade someone to let me show I was capable of it In the ensuing months both problems seemed insoluble Obviously I had to tender a medical explanation of myself to any prospective employer the term appearing on it was "cerebral diplegia," and I suspected that a prudent resolve to keep clear of the unknown (for the condition is still unknown to many people) would militate against my being employed I am not sure whether in the aggregate other people's ignorance of the disability hindered or helped In the end the problem solved itself I was told by friends of a form of librarianship which they thought would suit me I applied, was interviewed over—of all inauspicious things—a cup of tea, and was offered a job At the end of a month I was told what I most wanted to hear—that I was doing the work of a normal person with no allowances made

That perhaps should be the end of the story In all these years, however, I had done little domestic work, because I was fully occupied elsewhere Less than two years ago I changed my lodgings and began to cook and clean for myself Friends, and even my mother, doubted whether I could manage it, but I knew domestic routine well enough and retained my old confidence that what I knew how to do I should eventually succeed in doing As always, my ability increased with practice In cooking, liquids are the only real difficulty, but I use large jugs and pans, from which I am less likely to spill If I have occasion to fill a glass or cup I fill it where I am going to use it When I had lived thus for several weeks I suddenly realised that I had come as near to self dependence as do the majority of people in our complex civilisation

Within the last two years also, I have benefited from specialised cerebral palsy treatment which was not to be had in this country until comparatively recently One of its heartening results is that I am gradually finding myself able to write in something approaching the normal fashion Looking back, I see myself acting as would any child experiencing a comparable disability offset by good general health and fair intelligence, but any success I have had in minimising my handicap I owe largely to circumstances Foremost among these I would put wise handling in childhood, the chance of a normal education, and, finally, work in which to prove myself, with all that this means in confidence and serenity

"Hospital experts tell us that for an efficient hospital service we require an increase in beds in the nature of 40% above the present accommodation I suggest this is the wrong method of approach and that the main function of the hospital service should be to see in what way the number of beds could be *reduced* This approach makes the problem much more difficult It is far easier, if much more expensive, to treat existing patients than to carry out investigations into the cause of the illnesses and the means at our disposal of preventing them with one exception no Regional Hospital Board in this country has amongst its members a professional epidemiologist'—DR HUGH PAUL, M.O.H for

In England Now

A Running Commentary by Peripatetic Correspondents

ON Friday mornings the great amphitheatre is crowded to suffocation, one had never imagined that there were so many people in Paris interested in dermatology The back four rows are full of students and nurses, a hundred or two The middle benches are occupied by post graduate students from all over metropolitan France, the colonies, and even the lands of dermatological heresy Flemish mingles with the honeyed tones of Louisiana, heavily accentuated Breton with the gallicked staccato of southern lands The front rows are reserved for senior colleagues and distinguished visitors, each of whom as he enters precipitates a fresh epidemic of hand shaking

At last the Professor appears, deus ex machina All stand until he waves them to their seats with a gesture both cordial and impatient The cases rapidly succeed one another and are demonstrated to the throng with humour, skill, and touching humility The audience is by no means passive and at times the scene recalls a cattle market, the poor beasts being prodded and pushed, the cries of claim and denial growing louder and more insistent until the hubbub is stilled by the thin high voice of the Professor rising above the din. What can the new student gain from such heated discussions of minutiæ, from the distant parade of rarities, the moutons à six pattes? But the Professor is aware of his gallery, now there must be no dermatology through a telescope This case must circulate, mark it well It is a chancre, whose owner looks more sheepish than the alleged owner of six legs

* * *

The narrow road to consultant status is so hedged about by family commitments that when the principal of a practice in which I was once a part-time assistant telephoned to say his partner had a feverish cold I gladly accepted his invitation to help with an evening surgery The waiting room was fuller than I had ever seen it in the old days, when a man of some 30 years presented himself "I am quite well," he announced, "but I can't get up in the morning" My immediate reaction was sympathetic There were no other symptoms, so here was a problem should a member of the College and a doctor of medicine allow a patient to come and go unexamined? This could not be, but neurological examination revealed no grave mischief "What would you like me to do?" I inquired "Can't you give me a bottle of something?" he said The problem became more difficult He was obviously the sort of man who would resent any treatment which prevented him enjoying a full night's sleep, and I had no wish to make him join the numerous gathering outside who required sleeping tablets I suggested an alarm clock "No use," he said, "doesn't touch me" "Can't your wife give you a nudge with her knee?" I asked It seemed that she would be the next patient in and was suffering from sciatica I presumed she had only one leg and bilateral disability of the arms, and pursued this line no further "Mist Acid Strych," I wrote on the pad "Thank you," he beamed He rose to go and then remembered "Can I have a certificate, please, and will you date it for last Monday? I've missed three days through this already!"

* * *

Have you ever had hysterical purpura? I have It happens that I am carrying out some experiments on volunteers, and, as seems only fair, I myself act as one of the principal guineapigs On the day that I developed my hysterical manifestation, I had an injection of "X" and then ran up and down a long flight of stairs until exhausted I managed more than 1100 stairs up and down and decided this was not a bad performance being close on 40 and not a great one for exertion Unfortunately, the programme called for a similar burst two hours later I excused myself from the professorial ward round and went down to the laboratory torn between a desire to know the results of the experiment and a strong distaste for taking too much exercise twice in one day Happening to glance at my hands, I was

it was necessary to open both pleural cavities and excise a segment of the pericardium and 2 in of the left innominate vein

The tumour was very vascular, and the advantages of the continued use of diathermy precluded the addition of cyclopropane or ether which would have been indicated in view of the unusual resistance of this patient to thiopentone A trial dose of decamethonium iodide 0 5 mg was then given, and as no effect was discernible after 5 minutes a further 2 5 mg was injected This caused no obvious respiratory paralysis but "assisted respiration" was facilitated A total dose of 7 5 mg of decamethonium iodide was used over a period of 35 minutes There was a 5 minute period of intercostal paralysis at no time was it possible to control respiration completely, but adequate ventilation and a steady mediastinum were obtained

Recovery from both the decamethonium iodide and the anæsthetic was rapid and uneventful Atropine gr $^1/_{50}$ and neostigmine 2 5 mg were given intravenously at the conclusion of the operation an intramuscular injection of atropine gr $^1/_{100}$ and neostigmine 5 mg was given half an hour later, by which time the patient had regained consciousness The subsequent postoperative course has been uneventful

I am of the opinion that the tolerance of this myasthenic patient was certainly no less, and was possibly slightly greater, than would have been expected in a normal patient of similar build

My thanks are due to Dr Douglas McAlpine and Mr T Holmes Sellors

B A SELLICK
Consultant Anæsthetist

Middlesex Hospital
London W 1

A SIMPLE LOW-SODIUM RÉGIME

SIR,—Although the cause of œdema in congestive heart failure is still obscure, the value of sodium restriction in the management of this condition is firmly established [1 2 3] While severe water restriction has been abandoned, most workers are averse to forcing fluids as Schemm [4] advocates, but give only as much water as the patient desires [2 3]

There is less unanimity on the optimal degree of sodium restriction, and this is reflected in the variability of salt content (from 1 to 3 g) in the routine low sodium diets of different teaching hospitals [5 6] In the treatment of hypertension, maximal levels have been fixed variously at 500 mg,[7] 250 mg,[8] and 150 mg [9] per day But in the treatment of congestive heart failure, where salt excretion must be forced by mercurial diuretics, extreme restriction of dietary sodium increases the risk of precipitating uræmia, especially in the elderly,[10] in whom cardiac and renal impairment often coexist Probably the optimal intake in the management of congestive heart failure lies between 250 and 750 mg of sodium per day

Even under strict supervision in "metabolic units" the actual dietary sodium may be 50% greater than the calculated amount,[5] while the "low salt diets" of the less well supervised kitchens of many hospitals are a myth On the "salt-free" diets of two large hospitals employing dietitians and kitchen supervisors, normal individuals excrete up to 8 g of urinary chloride per day [10] Routine use of the Fantus [11] test for urinary chloride (and hence a rough but useful estimate of urinary sodium) demonstrates the difference between prescription and treatment

1 Bridges W C Wheeler E O White P D New Engl J Med. 1946 234 573 Peters J P Ibid 1948 239 353
2 Reid H A Hughes W Lancet 1949 i 593
3 Crutchfield A J jun Wood J E jun Ann intern Med 1948 28 28
4 Schemm F R Ibid 1942 17 952, Ibid 1944 21 937
5 Medical Research Council Lancet Nov 11 1950 p 509
6 Wheeler E O Bridges W C White P D J Amer med Ass 1947 133 16
7 Grollman A J Amer med Ass 1946 22 864
8 Ecko H Brit med J July 15 1950 p 144
9 Kempner W Med J N Carolina 1944 5 125
10 Bedford P D Unpublished observations
11 Fantus J B J Amer med Ass 1930 107 11

In a hospital admitting large numbers of elderly patients in acute and chronic congestive heart-failure, the "salt free" diet had been proved unreliable and attempts to improve it abortive As a low sodium régime of known and fixed constitution was necessary both for treatment and for research, Karell's [12] simple "cure de lait" was modified, with the foregoing desiderata in mind, and has proved eminently satisfactory as short term therapy The original "milk cure" provided too small a fluid intake and too low a calorie value to be acceptable

4 pints (2250 ml) daily of a mixture of equal parts of milk and water are given by mouth the patient being allowed in addition as much water as he wishes This diet contains approximately 570 mg of sodium and is equivalent to about 750 calories [13] (The sodium content of Oxford's tap-water is 7–19 mg per litre [14]) It has commonly been fortified with extra protein by the addition of calcium caseinate up to 3 oz (90 g) per day (as 'Casilan,' Glaxo), which increases its calorie value to about 1050 and its sodium content to 650 mg The régime is continued for no longer than 14 days

On this diet normal individuals "stabilise" their urinary chloride excretion at 2–3 g per day within 2–5 days In over 150 cases of congestive heart failure with œdema, it has provided a simple and satisfactory means of ensuring dietary control in the early stages of treatment

The only claims advanced for this modified Karell regime are (1) it is simple to prepare and can readily be managed by a ward sister or a busy housewife, (2) its constitution is known, and its sodium content is as low as the low sodium régimes of well-equipped and well supervised hospitals, and (3) it provides an adequate fluid intake

Its disadvantages are (1) as with all low sodium régimes, monotony and unpalatability, though no difficulty has been experienced in achieving willing perseverance for a fortnight, (2) low calorie value, but this has proved no handicap over so short a period, (3) too high a sodium content for the proper treatment of hypertension

This régime is not meant to supersede formal low sodium diets where supervision is adequate But where adequate supervision cannot be exercised, as in general practice and in many hospitals, this simple low sodium regime may ensure dietary control during the initial stages of treatment of congestive heart-failure

P D BEDFORD

Cowley Road Hospital
Oxford

VITAMIN K IN ALLERGIC PURPURA

SIR,—In your leading article of Dec 2 you refer to the lack of a reliable specific remedy in Henoch Schönlein purpura and other conditions

I have treated 3 cases of allergic purpura, showing manifestations of the Henoch Schönlein syndrome, with synthetic vitamin K, with resulting rapid recovery

In the 1st of these cases a large spontaneous ecchymosis (5 in by 3 in) occurred on one shoulder with several smaller ecchymoses on the thigh of the same side Shoulder and knee joints on this side were swollen red and tender All blood tests were normal, except the prothrombin time (Quick), which was 60 sec (normal control 16 sec) After one week's treatment with synthetic vitamin K (20 mg orally t d.s) the condition had resolved and the prothrombin time was 13 sec (control 13 sec)

In the 2nd case there was a long family history of allergy The patient a woman from time to time had small ecchymoses on her limbs There were no joint alimentary or renal signs Prothrombin time was 26 sec (control 16 sec) all other blood findings were normal The condition again cleared up rapidly with vitamin K, and one week later the prothrombin time was 15 sec (control 14 sec)

12 Karell P Arch gén Méd 1866 2 513
13 McCance R A Widdowson E M Spec Rep Ser med Res Coun Lond no 235 H M Stationery Office 1946
14 Crawley H H Personal communication

one or two which I needed for the demonstration of prevalent diagnostic errors Were I ever provoked into the publication of the remainder, it would be seen that the general run of the "psychiatric examinations" were very haphazard affairs The reports of different psychiatrists upon the same boy were sometimes flatly contradictory, and the general lack of psychological knowledge and disciplined scientific thinking were maladroitly disguised by long words and nearly meaning less shibboleths

But I must drag myself from the pleasures of polemic to make some positive suggestions Mental ill health, it is now realised, has its roots in childhood, which means in our family life or wherever children are The main damage is done before the patient comes to the clinic The spotting of the unhappy child in his pre delinquent, pre neurotic, or pre psychotic period must be the work of those who have continuous contact with the nation's children This means that the elements of emotional hygiene must form part of the training of the school teacher, club leader, school welfare officer, and probation officer, and above all of the family doctor

Furthermore I am certain that the essentials of the modern personality psychology, with its straightforward analysis in terms of human relationships and basic emotional needs, is simple enough to be handled by these varied types of social practitioner If, for example, we acted on the principle that every human being, to remain emotionally healthy, must feel secure as a member of a small "belonging group," we would largely solve our "maladjustment" problem Yet one hears of cases where shock therapy and other more drastic measures are resorted to without any attempt to readjust the patient's human situation It is for this reason that I have emphasised the need for guides to observation which will direct the attention of the non specialist social practitioner to the patient's defective human relation ships, and indicate to him the most likely causes of the anxiety and the seriousness of the false adjustment

One might say that, with their main work lying in other directions, the doctor, school teacher and social worker should be equipped to render psychological first aid The case needing more than advice upon common sense lines would be handed over to the fully trained worker in mental health

Even the psychological specialist does not require to work through the full medical course And the three years which would be the minimum for his becoming a competent psychologist, after the 4–5 years of his general course, would surely discourage the student at a time when many more clinicians are required The general medical course would probably burden him with much he would never need, and not go far enough along other lines After a discussion with a lecturer in anatomy at a London training hospital, during which I raised a number of neurological points which interested me as a psychologist, he surprised me by saying "I never touch upon any of these things in my lectures" The psychologist, then, would apparently require much more neurology than the general practitioner and less general anatomy and pharmacy

The issue is more than a personal one between academic ally and medically trained psychologists In my report I suggested that the poor results achieved by psychology as a science were in part due to the one sidedness of the training of each It is rather a question, then, of re thinking and re planning the professional training both of the general social practitioner of every kind and of the mental specialist in the light of our present social needs

D H STOTT

Redhill Surrey

HERPES ZOSTER AND VARICELLA COMPLICATED BY PARALYSIS OF THE TRANSVERSE COLON

SIR,—The following case has some interesting features

On Nov 9, 1949, the patient, a man aged 79, was suddenly attacked by pain in the hepatic region The next day herpes zoster manifested itself, and spread rapidly over the skin area supplied by the 8th, 9th, and 10th dorsal nerves of the right side Pain was intense, especially over the epigastrium

On Nov 13 widespread but discrete varicella vesicles appeared on trunk and extremities, with a few scattered vesicles on the scalp The herpes vesicles had become confluent, and the affected area was covered with huge bullæ Pain was still severe On Nov 18 'Aureomycin 250 mg once daily was started, but this was discontinued after a week because no benefit had been noted By Nov 9, the herpetic bullæ had all broken and the area had the appearance of a third degree burn.

On Dec 12 a disturbing sensation of coldness and weight suddenly developed in the situation of the transverse colon From this time forward no natural motion of the bowel occurred until Jan 20, 1950 A number of laxatives and purgatives were taken, but these caused only distension and distress It appeared that peristalsis in the transverse colon had ceased and relief was not obtained until high colonic wash outs were commenced During these, discomfort in the region of the hepatic flexure was pronounced, and a quantity of scybala came away towards the termination of the return of the enemata On Jan 16 a barium enema was given and subsequent X ray examination revealed nothing abnormal During the thirty nine days that this condition persisted the patient s condition deteriorated, he lost 28 lb in weight and vomited several times, depression was intense

On Jan 19, against medical advice, the patient took a heroic dose of magnesium sulphate (1½ oz), bringing away quantities of scybala From this time onwards bowel action was normal However, post-herpetic pain continued over the site of the zoster area, and there has been a persistent dragging and tearing sensation in the abdomen, especially over the transverse colon On April 17, weekly application of radiotherapy to the zoster area were commenced, but these were discontinued after the third application because no improvement had taken place At both sites pain persists twelve months after the onset

It appears that in this case herpes zoster has involved not only spinal nerves but the sympathetic innervation of the transverse colon

SURGEON

DECAMETHONIUM IODIDE IN MYASTHENIA GRAVIS

SIR,—In their article of Nov 18 Dr Paton and Dr Zaimis discuss the difference in mode of action of *d* tubocurarine chloride and decamethonium iodide in producing neuromuscular block They refer to the well known idiosyncrasy to tubocurarine in myasthenia gravis and suggest that no such idiosyncrasy is to be expected in the case of decamethonium iodide

The following description of the use of decamethonium iodide during the course of thymectomy for myasthenia gravis confirms this view

Early this year a tall, heavily built policeman developed diplopia ptosis and increasing muscular weakness Neostigmine up to 30 mg two hourly with atropine gr 1/100 had been required to stabilise him but his disability was increasing and it was decided to perform thymectomy

He received his usual dose of neostigmine and atropine three hours before operation, and 'Omnopon gr ⅓ and scopolamine gr 1/150 were given one hour before 0 75 ml of 10% cocaine solution was injected through the cricothyroid membrane to anæsthetise the larynx and trachea Induction by thiopentone 1 g was followed immediately by oral intubation, using a cuffed tube 2 litres per minute each of nitrous oxide and oxygen were administered by means of a semi closed circuit with circle adsorber and repeated small doses of thiopentone were injected into a saline drip

A sternum splitting approach to the anterior mediastinum was performed by Mr T Holmes Sellors and a malignant tumour of the thymus was discovered During its removal

STRIÆ CUTIS DISTENSÆ

SIR,—The following case is reported because of the recent interest [1 2] in coloured lineæ distensæ developing during an infection.

A tall, thin weedy boy, aged 17, was admitted on Aug 6, 1949, having been ill for a week He was found to have a large right-sided pleural effusion Diagnostic thoracentesis on Aug 8 below the angle of the right scapula in the 8th intercostal space produced clear straw coloured lymphocytic fluid No organisms were seen, culture and guineapig inoculation showed no evidence of tuberculosis On Aug 15 I examined him again and was surprised to find extensive purple lineæ distensæ on his back they had certainly not been there 7 days earlier They were more numerous on the side of the effusion and over the lower lumbar area they were wider and longer Pyrexia gradually settled during the next 3 weeks and the patient was discharged well after 4½ months rest, having gained 17 lb (8 st 10 lb on admission, 9 st 13 lb on discharge) He was seen again in January and September, 1950 and has remained well Chest radiography shows residual pleural thickening only There was no evidence of an endocrinopathy Urinary excretion of 17 ketosteroids was 5 6 mg per day on Sept 30, 1950 (normal male 8–22 mg per day) The clinical course was that of a primary tuberculous effusion

The lineæ distensæ were still purple though less so when seen in September they were wider, longer, continuous in some places across the midline, and more marked on the left side Over the sacrum they had faded from purple to white

The appearance of red or purple lineæ distensæ has been noted during treatment with 'Cortisone,' [3 4] and Simpson [2] has stated that where they are found clinically "one can conclude with reasonable confidence that there is hypersecretion of adrenal cortex hormones" Medvei [1] adduced a case in a youth with lobar pneumonia as an argument against the view of Simpson [5] that coloured lineæ distensæ are due to "the adrenal glands secreting an excess of cortisone, and that their hyper function is, therefore, playing an important part in the pathology of the condition observed" Selye,[6] however, states that the "general adaptation syndrome" may develop as the result of "non specific stress" an infection may produce the hormonal defensive response, which is accompanied by an increase in the secretion of A C T H—a "glucocorticotropic" hormone which induces the adrenal cortex to produce cortisone I suggest that in the case reported above the stress of infection induced the increased production of cortisone, which was manifested in the coloured lineæ striæ

Persistence of the purple colour should mean continued high production of cortisone, the result of continued stress, and this is a reasonable hypothesis in a case of primary tuberculous effusion, which carries a 20% risk of pulmonary tuberculosis, usually developing within five years In addition to this possible source of stress, my patient shows signs of possible genetic inferiority He is surly, unappreciative, and a poor mixer During 4½ months in hospital he never "adapted" himself to his circumstances, refused to occupy his time usefully, and never shared the cheerful atmosphere of the convalescent home In this case, then, continued stress could be explained by a primary tuberculous effusion, poor physique, with rapid skeletal growth, and unusual personality From the clinical facts that Medvei gives it is impossible to speculate why his "tall, slim, well built youth," aged 20, with lobar pneumonia should have had persistent purple striæ after 6 years, but it is tempting to wonder whether the diagnosis was unequivocal, since the possibility of a primary tuberculous pleurisy would simplify the explanation

1 Medvei V C *Lancet* 1950 i 1174
2 Simpson, S L *Ibid* Sept 23 1950 p 415
3 McNee J W *Brit med J* 1950 i 113
4 Sprague R G Power M H Mason H L Albert, A Mathieson D R Hench P S Kendall E C Slocumb C H Polley H F *Arch. intern Med* 1950 85 199
5 Simpson S L *Post-grad med J* 1950 26 201
6 Selye H *Brit med J* 1950 i 1383

The distribution of the striæ in the present case calls for comment

They were predominant on the right side, that of the effusion The right side of the chest moved little on respiration, and, though the effusion was large and must have increased the volume of the chest on that side, clinically and radiologically there was no evidence either that the ribs were more horizontal than normally or that the intercostal spaces were enlarged and obliterated Distension is usually accepted as the explanation for the site of coloured striæ in pregnancy, Cushing s syndrome, and during treatment with cortisone This conception that distension causes a cleavage in the deeper parts of the cutis possibly due to deficiency of elasticity, is rather naïve, it is surely more acceptable that distension merely determines the site of lesions to which there is already a predisposition In the present case there was no gain in weight coincident with the appearance of the striæ, and even if there had been there is no satisfactory explanation of why the striæ appeared on the back especially as 'pressure areas" were not affected Perhaps the predominance of lineæ on the right side was determined by either the underlying disease, by distension of the right hemithorax that was not recognised clinically or (which is unlikely) by greater pressure on the skin on that side because, to breathe more easily, the patient would tend to lie with the sound lung uppermost No association was noted between the site of needle puncture for the thoracentesis and the development of the striæ The subsequent redistribution of striæ in position, length, and width, and the fading of some to white while new purple ones appeared is equally mysterious

Parkes Weber [7] has shown special interest in striæ occurring "in the absence of the ordinary causes" and has suggested [8] that "the relative insufficiency of the cutis, which is a part factor in the causation of the cutaneous striæ in so-called 'idiopathic' and post infection cases, may be due to a *temporary* basophilic hyperpituitarism associated with the period of rapid growth at and following puberty" The striæ seen in cortisone treatment, and my suggestion, are therefore anticipated by 18 years

The increased output of cortisone in pregnancy is satisfying confirmation of the old observation that rheumatoid arthritis and peptic ulcers improve spontaneously during pregnancy If coloured lineæ striæ can be accepted as evidence of an increased production of cortisone, this simple clinical observation opens up many possibilities How often do pregnant women with rheumatoid arthritis get purple lineæ? It is my impression that abdomens showing purple lineæ during pregnancy, and those young parous women with much striated abdominal skin, as flabby as a balloon half filled with water, belong to a group where "stress" may be active Perhaps it could be shown that purple striæ—their position on the abdomen favoured by distension—are associated with increased production of cortisone due to a combination of pregnancy and stress It would be interesting to know whether they ever appear so suddenly as to be fully developed in seven days, and, if this happens, whether there is then an association with stress and not with distension

Perhaps adolescents develop purple striæ with special ease, five of the six patients of Sprague et al [4] on cortisone were aged 17 or less My impression is that the younger the woman the more extensive are the purple striæ Most people will be acquainted with the ragging that the lanky adolescent three quarter comes in for in the rugger changing room because someone spots the purple lineæ "gravidarum" on the upper outer part of his thighs school and Service medical officers have a good opportunity of confirming this observation and noting in such cases any additional stress beyond that of adolescence Perhaps something of interest might come of watching for persons with purple lineæ from

7 Weber F P Rare Diseases and Some Debatable Subjects London 1947
8 Weber F P *Urol cutan Rev* 1932 36 731

In the 3rd case symptoms developed after three daily injections of crystalline penicillin G, administered for cellulitis of the leg There was massive purpura, involving both lower limbs and the lower abdomen, with joint swelling of both knees, ankles, wrists, and fingers There was an effusion into the knee joint on the side with the original cellulitis Various anti histamine preparations were administered, with no effect Oral and intramuscular vitamin K was then administered, with rapid improvement and eventual resolution Unfortunately, in this case it was not possible to perform blood investigations However, allergic purpura has been reported as a complication of penicillin therapy,[1] and there seems little doubt that it was so caused in this case

Vitamin K may not be a specific remedy for Henoch-Schönlein purpura Nevertheless, when deficient in the body it is a clot promoting agent, and it might well be tried in these conditions

Twickenham DAVID WHEATLEY

OCCUPATION AND BRONCHIAL CARCINOMA

SIR,—The present acute interest in the ætiology of carcinoma of the lung is reflected in Professor Dungal's article (Aug 12), your leading article in the same issue, and the letter from Sir Ernest Kennaway (Sept 23) which drew attention to the increasing incidence of this disease More recently Doll and Bradford Hill[2] have published evidence implicating smoking as a causal factor

The relation of occupation to this disease has long been a subject for speculation Some years ago I collected data on occupation in 172 cases of certified deaths of males from carcinoma of the lung in the Metropolitan borough of Islington

A difficulty in relating occupation to disease is that nothing may be known about the duration of the occupation, and further, in old patients the occupation may have ceased many years previously (although this need not rule out the occupation as a causal factor) Moreover, an apparently increased incidence in any one occupational group may only indicate an aggregation of persons employed in this occupation in the area under review These 172 cases covered no fewer than 88 separate occupations, and it was essential to condense these into a smaller number of occupationally related classes When this was done it was found that the classes did not correspond with the occupational grouping for males shown in the official census returns for Islington In order to overcome this difficulty, and to attempt a standard of comparison, I compared the occupational incidence of carcinoma of the lung with the incidence of deaths from cancer of all other sites in the same occupational groups When in an occupational group, the ratio of deaths from carcinoma of the lung was high in proportion to deaths from cancer of all other sites, this would suggest that occupation was a possible causal factor In the accompanying table columns 1 and 2 show the deaths of males from cancer of all other sites in each of the years 1932 and 1936, and column 3 shows the total of deaths from bronchial carcinoma in the 5 years from 1932 to 1936

Occupation	*Cancer of other sites 1932*	*1936*	*Cancer of lung 1932–36*
Painter and decorator	8	7	9
Actor musician artist	1	3	3
Labourer and builder	20	19	21
Railway employee engineer smith iron founder	*3*	*14*	*21*
Butcher and meat porter	7	4	3
Furnisher french polisher	8	4	4
Fishmonger	3	0	1
Bank hotel and office messenger	7	4	5
Hairdresser	2	1	0
Postman and P O employee electrician	*3*	*6*	*10*
Laundryman	1	1	1
Ironmonger and locksmith	3	0	1
Window-cleaner }	1 } 6	4 } 7	2 } 6
Street trader dustman }	5 }	3 }	4 }
Cellarman barman	3	4	5
Printer publisher bookbinder	11	8	5
Horsekeeper carman	7	9	3
Traveller warehouseman shop keeper storekeeper	3	3	4
Watchman caretaker	3	5	3
Draper tailor	7	8	5
Tramway employee	2	4	1
Dairyman cattle drover	4	0	1
Clergyman dentist clerk manager insurance agent	10	13	10
Bootmaker and traveller in boots	4	2	3
Jeweller clockmaker scientific instrument maker	8	8	4
Carpenter and woodworker	4	7	6
Brush and basket maker	2	1	1
Tobacconist newsagent &c	6	1	0
Motor-driver car washer	*4*	*8*	*13*
Packer checker boxmaker	3	2	2
Gardener greengrocer &c	5	5	3
Chemist chemical engineer	2	0	2
Waiter cafe worker baker	*3*	*3*	*10*
Coal porter sweep	1	3	3
Policeman warder	0	4	1
Sailor	0	1	2

The numbers in each group are too small to be of statistical significance, but the four groups in which the proportion of lung cancers is highest are (1) railway workers, engineers, smiths, iron founders, (2) G P O workers (including postmen), electricians (5 of the 10 lung cancers in this group occurred in electricians), (3) motor drivers, car-washers (6 of the 13 cancers in this group were in taxi drivers), (4) waiters, café workers, bakers (5 of the 10 were bakers) In groups 1, 3, and 4 inhalation of combustion products from coal, coke, or petrol might occur, but it is difficult to put group 2 (electricians, &c) in this category

This limited investigation proves nothing, but it may be of value to future investigators

Colindale Hospital London N W 9 W E SNELL

1 Anderson A B *Med J Aust* 1947 1 305
2 Doll R Hill A B *Brit med J* Sept 30 1950 p 739

PREPARING FOR GENERAL PRACTICE

SIR,—The views on general practice in this country expressed by three visiting deans of American medical schools, on which you commented in your issue of Oct 28, are in general agreement with the Collings Report,[1] and are, in my view also, only too correct

Whatever the general practitioner may have been in the past, to describe him today as the backbone of the profession is nonsense In my 28 years of general practice there has been a vast increase in the number and variety of specialists, and this growth of specialisation has been accompanied by a corresponding decline in the clinical importance of the general practitioner Today he is often little more than a mere signpost and disher out of placebos

The most important factor in the debasement of general practice is, to my mind, competition between general practitioners for goodwill The patient can and often (I might almost say usually) does bring economic pressure to bear on his general practitioner, in order to secure the type of medical treatment *he* wants This enforced pandering to the whims and, often, ignorance of patients tends in the long run to induce clinical demoralisation of even the most strong minded and conscientious of general practitioners I do not deny that competition can be useful in stimulating laggards to greater attention and even civility to their patients, but this advantage is, in my view, heavily outweighed by the damage done, not only to the practice of good medicine, but in turning those who would otherwise be friendly colleagues into distrustful, isolated competitors It also results in enormous waste of public money on useless medicines

Let us be paid either by salary or, like consultants, by session, but at all costs let us be done with competition for patients

Wallasey LENNOX JOHNSTON

1 Collings J S *Lancet*, 1950 1 555

of elastic fibres, with disappearance of these elements in places, and clumping and fragmentation of the elastic in other areas There was no evident pigmentation and no obvious local change in the blood vessels

Though only single estimations of ketosteroid excretion were possible, the change in the 20 ketosteroid values while the 17 ketosteroid excretion remained practically stationary appears highly significant

Increased production of glucocorticoids is thought to mobilise glucose from the body proteins The skin is the largest organ of the body, and represents about 16% of the total weight of an adult It therefore seems reasonable to suppose that the skin supplies much of the protein used for gluconeogenesis, is weakened thereby, and becomes more liable to injury Increased tension on skin so affected, due either to posture as described by Hurford and Snell,[1] or to the accommodation of deposits of subcutaneous fat or a space occupying lesion, such as an intra abdominal tumour, may well produce the histological features of striæ cutis distensæ

The normal glucose tolerance curve seems to confirm Simpson's suggestion[4] that increased adrenal cortical output is balanced by a secondary hyperinsulinism This may be a factor in determining the gain in weight

I am indebted to Mrs A M Robinson for the ketosteroid estimations and to Dr R J R Cureton for histological examination of the skin I am also grateful to Dr H C Aston, of Bethnal Green Hospital, for permission to publish the case, and to Dr E F Scowen for criticism and advice

St Bartholomew's Hospital London D'ALMERO KOK

GERMAN MEASLES IN GIRLS' SCHOOLS

SIR,—Recently my youngest child, a girl of 6½, developed rubella The attack upset the child mildly for a day or two, and at the end of 10 days she returned to school (I understand that the latest Ministry circular recommends 7 days' exclusion from school from the appearance of the rash) Apparently her return was too early to be in accordance with the "regulations" and she was told to keep away from the other girls

I feel that enough is already known about the effects of rubella on the fœtus in early pregnancy to warrant revision of such "regulations" as these For my part, I am thankful that in years to come my daughter is unlikely to present me with a maimed grandchild, consequent upon an attack of rubella in early pregnancy It seems a pity that the "regulations" prevent her from conferring this great boon on her school friends It may well be that in time to come deliberate infection of girls with rubella during their school days will be offered along with vaccination, diphtheria immunisation and the rest

General Hospital
South Shields, TERENCE G ROBINSON

UMBILICAL-CORD BLOOD

SIR,—Dr Lehmann's letter earlier this year,[5] on the disturbance of prothrombin time estimations by cleaning the glassware with soapless detergents, demonstrated the value of communications on purely technical matters in your correspondence columns It is with this letter in mind that I record a finding that may be of assistance to workers in the field of rhesus blood groups

Occasionally samples of umbilical cord blood are contaminated with an undue amount of Wharton's jelly While this is usually removed by simple washing as in the Coombs test, rarely the clumping of the test cells in suspension due to this viscous connective tissue mucin is not overcome by washing, occasionally also a rapid slide test is called for When the phenomenon has been encountered in this laboratory we have found that the addition of a small amount of a commercial preparation of hyaluronidase (one drop of a solution containing 1 mg in 10 ml of saline to tube or slide) will prevent the clumping, which interferes with the interpretation of tests It has been found, further, that much higher concentrations of hyaluronidase do not interfere with any routine blood grouping procedures

King Edward Memorial Hospital,
Ealing, London W 13 W S KILLPACK

PYREXIAL TREATMENT OF ULCERATIVE COLITIS

SIR,—In the early days of treatment of general paralysis of the insane by artificial pyrexia, a male general paretic was admitted to one of my wards at the County Mental Hospital, Rainhill In view of his very poor general condition, complicated by long standing ulcerative colitis it was at first thought inadvisable to attempt pyrexial therapy, but at the insistent request of his wife a modified course of 'Pyrifer' was given It was observed with surprise that after the fourth intravenous injection the diarrhœa ceased From that time onwards the stools showed satisfactory formation and there was no further evidence of colitis Unfortunately the patient died a few months later as a result of his cerebral disease, and no conclusions could be drawn from the short period of apparent cure of the ulcerative colitis

It was then brought to my notice that a male patient in another section of the hospital was suffering from ulcerative colitis of nearly two years' duration, and it was decided to study the effects of pyrifer The following notes have been extracted from his case sheet

1934—May 19 taken ill with diarrhœa stools containing blood and mucus afebrile May 26 Flexner organisms isolated from stools case notified to medical officer of health as bacillary dysentery June 12 passing blood and mucus in stools general condition failing June 14 stools still show blood and mucus, no organisms of dysentery group now isolated, febrile, 99–103°F, general condition poor June 28 Bowel condition as before commonly febrile in evening slight improvement in general condition

1935—April 26 diagnosed as chronic colitis, average of six motions daily, often containing blood and mucus

1936—March condition unchanged April 4 to May 11 course of twelve injections of pyrifer producing on all occasions (except the third injection) temperatures of 103–104°F No blood or mucus found in the stools after the third intravenous injection

1937—Feb 17 no further diarrhœa no change in mental state

1941—Nov 12 reported diarrhœa Nov 14 Schmitz organisms isolated, 'Chinosol' exhibited for one month (details not given)

1942—Jan 15 clinically and bacteriologically clear, no evidence of colitis

1947—March 28 attack of vomiting occult blood in stools presumably acute gastritis (no evidence of active colitis)

1948—April 13 reported to have loose stools April 14 stools contained Sonne dysentery organisms but no blood or mucus, treated with phthalylsulphathiazole emulsion May 28 six swabs have been negative (no evidence of active colitis)

1950—May 31 no clinical signs of colitis

In the ten years after leaving Rainhill Hospital in 1938 I was able to use this therapy in a few cases in another hospital The results were reasonably good, but they were complicated by the fact that the pyrifer available during the war years produced less fever The ampoules had all been filled before September, 1939, and their potency, in my opinion decreased with time Using the fresh supplies obtained in recent years the previous pyrexial response has been observed

I can draw no definite conclusions from the small number of cases of chronic ulcerative colitis which I have been able to treat in the course of mental-hospital

4 Simpson S L *Post-grad med J* 1950 26 41
5 Lehmann H *Lancet* 1950 1 1133

whatever cause and using them as donors to transfuse a series of patients with rheumatoid arthritis

Finally it may be that "idiopathic" purple lineæ distensæ are a manifestation of primary tuberculous infection, and further observation may put their appearance on a level with phlyctenular conjunctivitis and erythema nodosum as a warning sign

I am indebted to Dr J O Ferry for permission to publish this case

C ROMER
Worcester Royal Infirmary Medical Registrar

SIR,—Hurford and Snell [1] reported the development of purple striæ in 32 patients with pulmonary tuberculosis They reviewed the literature on the subject and discussed the factors thought to be of ætiological importance They concluded that the striæ result from several concomitant circumstances (1) long continued local stretching of the skin (related in their cases to the posture adopted during treatment), (2) endocrine activity at puberty, and (3) an inborn constitutional tendency to develop striæ in the presence of the preceding factors They did not think that the site of the disease in their cases had any definite relation to the site of the skin lesions An increase of weight occurred in less than half of their patients, and they thought that neither this nor toxæmia was important ætiologically

Sprague et al [2] record the development of reddish purple striæ during 'Cortisone' therapy The colour remained for several weeks after the drug had been stopped Simpson [3] states that "where red and purple lineæ distensæ are found clinically, one can conclude with reasonable confidence that there is hypersecretion of adrenal cortical hormone" The following case is therefore of interest

A male tailor's presser, aged 18, thought he had "been losing some weight recently" He had developed malaise a fortnight before going to see his doctor, and was then admitted to hospital with a temperature of 101 6°F, and a large right sided pleural effusion of clear straw coloured fluid, from which tubercle bacilli were subsequently cultured No other abnormal physical signs were found The patient was of medium height and asthenic build, and was reasonably well covered

1 Hurford J V Snell W L *Tubercle* 1943, 24 16
2 Sprague R G Power M H, Mason H L, Albert A Mathieson D R, Hench P S Kendall E C Slocumb C H Polley H F *Arch intern Med* 1950 85 199
3 Simpson S I *Lancet* 1950 Sept 23 p 415

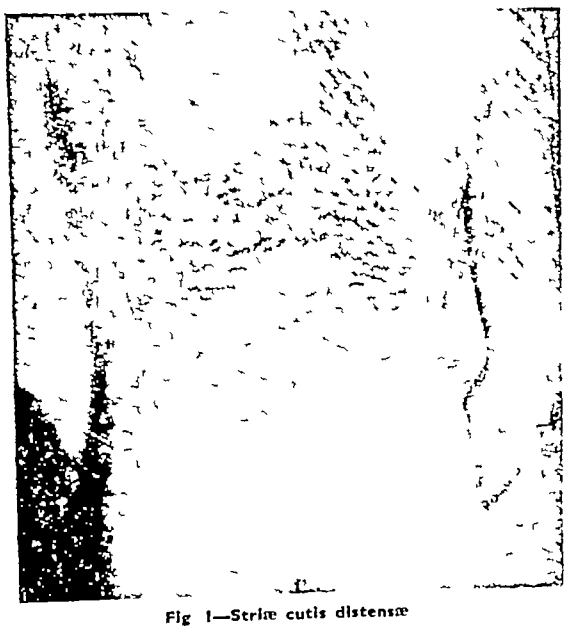

Fig 1—Striæ cutis distensæ

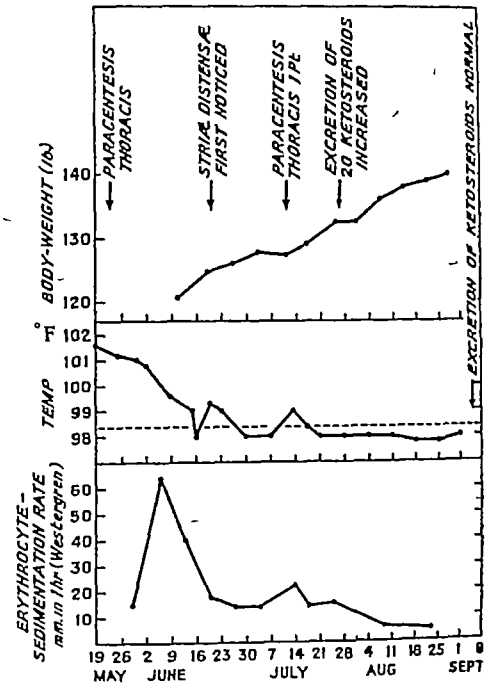

Fig 2—Progress chart

Treatment consisted in rest in bed as much food as he could take, and extra vitamins, including 100 mg of ascorbic acid t d s by mouth

Progress—His appetite was poor for the ensuing three weeks, during which he seemed to become thinner There after he began to eat well, and he felt well during the rest of his stay in hospital Five weeks after admission, during a routine examination, transverse purple striæ were noticed on his back in the lower dorsal region At this time he had put on only 4 lb in weight (from 8 st 8 lb to 8 st 12 lb) There was still slight fever The erythrocyte sedimentation rate (E S R) had fallen to 18 mm in first hour (Westergren) As the effusion showed no sign of absorption, a pint was aspirated eight weeks after admission The lineæ had increased in extent, to involve the lumbodorsal, and to a slight extent the sacral, regions (fig 1) Firm pressure with a glass slide produced incomplete blanching A tourniquet test was therefore done (100 mm mercury for five minutes), which showed slightly increased capillary fragility Ten weeks after admission the patient's temperature had fallen below 98 4°F, the E S R was 14 mm in first hour, and he weighed 9 st 6 lb (fig 2)

Investigations—A blood count showed 5,060,000 red cells per c mm, Hb 96%, white cells 11,600 per c mm (polymorphs 55%, lymphocytes 32%, monocytes 10%, eosinophils 2 5% basophils 0 5%) An ascorbic acid saturation test (700 mg given by mouth) showed that 180 ml of urine in 2½ hours contained 92 mg of ascorbic acid A glucose tolerance test gave the following results

Fasting	65 mg per 100 ml	No glycosuria
30 min	110	
90	140	
120	120	

The blood protein level was 7 5 g per 100 ml (albumin 5 0 g, globulin 2 5 g) The serum sodium level was 343 mg per 100 ml, and serum potassium level 19 6 mg The urinary excretion of 17 ketosteroids was 8 9 mg per day (normal in adult males 7–15), and 20 ketosteroids 6 5 mg (normal 1–3)

Further Progress—Thereafter though the pleural effusion persisted, the clinical improvement was maintained After fifteen weeks in hospital the patient was transferred to a pleural effusion unit, at which time he felt very well and weighed 10 st (an increase of 20 lb) The E S R was 5 mm in first hour The striæ had increased slightly in number and were still purple The urinary excretion of 17 ketosteroids was 8 5 mg per day and 20 ketosteroids 2 7 mg

Biopsy of striæ showed in the centre of the specimen beneath a rather atrophic epithelium evidence of destruction

of elastic fibres with disappearance of these elements in places, and clumping and fragmentation of the elastic in other areas There was no evident pigmentation and no obvious local change in the blood vessels

Though only single estimations of ketosteroid excretion were possible, the change in the 20 ketosteroid values while the 17 ketosteroid excretion remained practically stationary appears highly significant

Increased production of glucocorticoids is thought to mobilise glucose from the body proteins The skin is the largest organ of the body, and represents about 16% of the total weight of an adult It therefore seems reasonable to suppose that the skin supplies much of the protein used for gluconeogenesis, is weakened thereby, and becomes more liable to injury Increased tension on skin so affected due either to posture, as described by Hurford and Snell,[1] or to the accommodation of deposits of subcutaneous fat or a space occupying lesion, such as an intra abdominal tumour, may well produce the histological features of striae cutis distensae

The normal glucose tolerance curve seems to confirm Simpson's suggestion[4] that increased adrenal cortical output is balanced by a secondary hyperinsulinism This may be a factor in determining the gain in weight

I am indebted to Mrs A M Robinson for the ketosteroid estimations, and to Dr R J R Cureton for histological examination of the skin I am also grateful to Dr H C Aston, of Bethnal Green Hospital for permission to publish the case, and to Dr E F Scowen for criticism and advice

St Bartholomew's Hospital London D'ALMERO KOK

GERMAN MEASLES IN GIRLS' SCHOOLS

SIR,—Recently my youngest child, a girl of 6½, developed rubella The attack upset the child mildly for a day or two, and at the end of 10 days she returned to school (I understand that the latest Ministry circular recommends 7 days' exclusion from school from the appearance of the rash) Apparently her return was too early to be in accordance with the "regulations," and she was told to keep away from the other girls

I feel that enough is already known about the effects of rubella on the fœtus in early pregnancy to warrant revision of such "regulations" as these For my part, I am thankful that in years to come my daughter is unlikely to present me with a maimed grandchild, consequent upon an attack of rubella in early pregnancy It seems a pity that the "regulations" prevent her from conferring this great boon on her school friends It may well be that in time to come deliberate infection of girls with rubella during their school days will be offered along with vaccination, diphtheria immunisation, and the rest

General Hospital
South Shields TERENCE G ROBINSON

UMBILICAL-CORD BLOOD

SIR—Dr Lehmann's letter earlier this year,[5] on the disturbance of prothrombin time estimations by cleaning the glassware with soapless detergents, demonstrated the value of communications on purely technical matters in your correspondence columns It is with this letter in mind that I record a finding that may be of assistance to workers in the field of rhesus blood groups

Occasionally samples of umbilical cord blood are contaminated with an undue amount of Wharton's jelly While this is usually removed by simple washing, as in the Coombs test rarely the clumping of the test cells in suspension due to this viscous connective tissue mucin is not overcome by washing, occasionally also a rapid slide test is called for When the phenomenon has been encountered in this laboratory we have found that the addition of a small amount of a commercial preparation of hyaluronidase (one drop of a solution containing 1 mg in 10 ml of saline to tube or slide) will prevent the clumping, which interferes with the interpretation of tests It has been found, further, that much higher concentrations of hyaluronidase do not interfere with any routine blood grouping procedures

King Edward Memorial Hospital
Ealing London W 13 W S KILLPACK

PYREXIAL TREATMENT OF ULCERATIVE COLITIS

SIR,—In the early days of treatment of general paralysis of the insane by artificial pyrexia, a male general paretic was admitted to one of my wards at the County Mental Hospital, Ramhill In view of his very poor general condition, complicated by long-standing ulcerative colitis, it was at first thought inadvisable to attempt pyrexial therapy, but at the insistent request of his wife a modified course of 'Pyrifer' was given It was observed with surprise that after the fourth intravenous injection the diarrhœa ceased From that time onwards the stools showed satisfactory formation and there was no further evidence of colitis Unfortunately the patient died a few months later as a result of his cerebral disease, and no conclusions could be drawn from the short period of apparent cure of the ulcerative colitis

It was then brought to my notice that a male patient in another section of the hospital was suffering from ulcerative colitis of nearly two years' duration, and it was decided to study the effects of pyrifer The following notes have been extracted from his case sheet

1934—May 19 taken ill with diarrhœa stools containing blood and mucus afebrile May 26 Flexner organisms isolated from stools case notified to medical officer of health as bacillary dysentery June 12 passing blood and mucus in stools general condition failing June 14 stools still show blood and mucus, no organisms of dysentery group now isolated febrile, 99–103°F, general condition poor June 28 Bowel condition as before commonly febrile in evening slight improvement in general condition

1935—April 26 diagnosed as chronic colitis, average of six motions daily, often containing blood and mucus

1936—March condition unchanged. April 4 to May 11 course of twelve injections of pyrifer producing on all occasions (except the third injection) temperatures of 103–104°F No blood or mucus found in the stools after the third intravenous injection

1937—Feb 17 no further diarrhœa no change in mental state

1941—Nov 12 reported diarrhœa Nov 14 Schmitz organisms isolated Chinosol exhibited for one month (details not given)

1942—Jan 15 clinically and bacteriologically clear, no evidence of colitis

1947—March 28 attack of vomiting occult blood in stools presumably acute gastritis (no evidence of active colitis)

1948—April 13 reported to have loose stools April 14 stools contained Sonne dysentery organisms but no blood or mucus treated with phthalylsulphathiazole emulsion May 28 six swabs have been negative (no evidence of active colitis)

1950—May 31 no clinical signs of colitis

In the ten years after leaving Ramhill Hospital in 1938 I was able to use this therapy in a few cases in another hospital The results were reasonably good, but they were complicated by the fact that the pyrifer available during the war years produced less fever The ampoules had all been filled before September, 1939, and their potency in my opinion decreased with time Using the fresh supplies obtained in recent years, the previous pyrexial response has been observed

I can draw no definite conclusions from the small number of cases of chronic ulcerative colitis which I have been able to treat in the course of mental hospital

4 Simpson S L *Post-grad med J* 1950 26 417
5 Lehmann H *Lancet* 1950 1 1133

practice But it seems worth recording that in the case described the patient, despite two attacks of dysentery, has been free from any clinical signs of chronic colitis in the fourteen years following treatment with pyrifer

I am indebted to Dr M G McColl, psychiatrist at Rainhill Hospital, for supplying me with the extracts of the case notes

J ERSKINE HOWIE
Consultant Psychiatrist
Liverpool Regional Hospital Board

TROPHIC AND TROPIC

SIR,—Even if we do not completely agree with the opinion of Condillac and of some modern, logical positivists, according to whom Science is simply a well constructed language, there is no doubt that precise terms indicate precise conceptions, and thus the terminological chaos in contemporary endocrinology is not, unfortunately, a simple linguistic phenomenon A discussion of terms is thus welcome

"Tropic" means direction, and thus "thyrotropic hormone" means a hormone directed towards the thyroid and does not imply any further physiological conception "Trophic" means nourishing and fixes an erroneous physiological conception, because this special anterior pituitary hormone stimulates the secretory function of the thyroid and not its nutrition Deficiency of this pituitary hormone makes for hypoplasia of the thyroid and not for atrophy, these two terms are essentially distinct in Greek, atrophy indicating a nutritional phenomenon, and hypoplasia an organ inferiority, either congenital or due to disuse We keep the Greek radicals in scientific terminology, not to show off our classical learning, but because Greek is a language which expresses with the greatest precision various aspects of phenomena Thus, the terms "thyrotropic" and "gonadotropic" are more correct

May I avail myself of this opportunity to protest against another terminological cause of confusion in endocrinology—the use of initials instead of well constructed terms? Why L H, I C S H, L T H, and other confusing constructions reminding us of military bureaucracy, and manifesting laziness and even slovenliness of thought?

London W 1 A P CAWADIAS

REVOLT AT KINGSTON

SIR,—You will not wish your pages to carry, each week, a letter in which Dr Morgan accuses me of untruth and I repudiate his statements as being inaccurate or biased His letter last week answers none of my points and reveals an ignorance of the National Health Service which it is clear no fact or argument can alter

However, he introduces a new principle to the health service which must be rejected He suggests that appointment to the staff of a hospital by a regional hospital board does not make one a member of the staff of that hospital unless Dr Morgan agrees From his letter it would appear that general practitioners who hold no appointment, but by invitation of the hospital management committee visit their patients in hospital, are members of the staff while consultants appointed by the board are not to be so considered This strange doctrine clarifies and emphasises my point that no meeting of those actively working at the Victoria has ever been called

The issue, however, goes far beyond that The scheme for the reorganisation of the Kingston group has the full approval of all responsible for the hospital service of this country, and by this time next year the farcical position adopted by one fifth of the general practitioners in the group will be forgotten except for a lingering shame in their own minds

Kingston Hospital, Surrey D STARK MURRAY

MASS MINIATURE RADIOGRAPHY

SIR,—With reference to the letters from Dr Beynon (Nov 11) and Dr James (Nov 18), the no undressing technique was used in the mass radiography unit at the Royal Naval Barracks at Chatham in January, 1947 A survey of Admiralty civilian employees was under taken at that time, and it was found that there were not enough chest covers for female examinees They were therefore radiographed clothed, and the results were so good that since then I have not hesitated to use the technique whenever it has been more convenient to do so.

JAMES LEES
Lee-on Solent, Hants Surgeon Commander

REGISTRARS

SIR,—It would be as serious to underrate the value of the large non teaching hospital to the registrar in training as to fail to appreciate the fact, already well expressed in your correspondence columns, that the registrar is an essential part of the staff of such a hospital Without the experience of this type of appointment behind him, the new consultant, fresh from a registrar post in a teaching hospital, is likely for some time to lack the technical competence necessary for the proper charge of hospital beds

If the Ministry's proposals become operative, in the scramble for the services of the few remaining registrars the non teaching hospitals must not be sacrificed to the claim that all the training is done at the teaching hospitals

County Hospital,
Whiston near Prescot,
Lancashire J A MARTINEZ

SIR,—It took the Collings report to show how far the general practitioner had been separated from the hospital, and it has taken the Ministry's circular on registrars to show how far the hospital man has been separated from general medicine

Dr Talbot Rogers, in his article of Nov 25, has thrown a very useful plank, hewn from the dead bulk of the circular, across the gap, but the serious imbalance in the arrangement and the qualities of medical service will not be corrected until the hospital doctor and the practitioner both vanish, and a doctor takes their place —until the houseman–registrar–consultant progression, based on a single point of distribution of professional service and a single standard of quality, applies in each field of medical activity

When the activities of the local executive council, the regional board, and the hospital management committee, and of the school, industrial, and local health services are put into a single framework, based on area management under light Ministry control, we shall have an economy which will provide all the consultants and registrars we need, and some money to spare for over all development, health centres included

W J CRABB
Secretary Fulham and Kensington
Hospital Management Committee

St Mary Abbots Hospital
London W 8

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis during the week ended Dec 2 were paralytic 90 (111), non-paralytic 38 (19), total 128 (130) The figures for the previous week are in parentheses Uncorrected notifications for the corresponding week in 1947 and 1949 totalled 106 and 157

Total uncorrected notifications for 1950 up to and including the week under review are 8379 The corresponding figures for 1947, 1948, and 1949 are 8927, 2272, and 6483

Parliament

Domiciliary Physiotherapy Services

In the House of Commons on Dec 4 Mr KENNETH THOMPSON pointed out that some patients with, for example, heart-disease, or some elderly people with advancing infirmity, could not go to hospitals and clinics for physiotherapy To meet their needs several regions had worked out contractual arrangements with outside agencies, such as district-nursing associations and private practitioners, to give the patients physiotherapy in their own homes Such arrangements appeared to have had the blessing of the Ministry of Health No fewer than 26 district-nursing associations were operating a mobile service of this kind The regions had now received instructions which they interpreted as a direction to end their contracts with the district-nursing associations. Mr Thompson was uncertain whether the Minister of Health was seeking to cancel the present arrangements, to secure the fullest use of a skill in short supply, to ensure that the patient received adequate and proper treatment, or merely to economise He had not been able to discover any complaints about the service given by the district-nursing association, which cost 9s per treatment in the Liverpool area If a patient had to be taken to hospital for treatment the average cost for an ambulance would be, he thought about 20s a trip

Mr ARTHUR BLENKINSOP parliamentary secretary to the Ministry of Health, in reply, gave an assurance that patients who required physiotherapy in their homes on medical grounds would continue to receive it But domiciliary treatment of this kind was he insisted, a poor second best compared with that provided in a properly equipped hospital or clinic, and the Ministry would regard it as an exceptional case that should be treated at home With old people, as with others the important thing was to give active treatment, and not to provide domiciliary treatment on a sort of permanent basis The whole trend of modern medical treatment was to ensure the active participation of the patient as well as of the practitioner and specialist Apart from the limited amount of equipment that could be provided with a domiciliary team, it was not economical that trained staff should be wandering about the countryside instead of providing treatment for several patients together in a clinic. In the experience of the Ministry with contracts of this sort there was a danger of a gradual growth of demand unwarranted on medical grounds There must be reasonable control over how long the domiciliary treatment should go on, ensuring that patients should in due course continue their treatment in hospital The Ministry had entered into discussions with the regional hospital boards on the best way of ensuring that there should be no loss of treatment for those who must have it at home

QUESTION TIME

Hospital Boards and Publicity

Mr HECTOR McNEIL, Secretary of State for Scotland said tha representatives of the press regularly attended the meetings of regional hospital boards and the boards were grateful for the help and coöperation they received from the press Whether the regional board minutes were placed in the public libraries was within the discretion of the boards, who took the view which Mr McNeil shared, that this was not the best way of securing publicity They were adopting other means, and he was encouraging them to use those means to the full

Tuberculosis Nurses

Mr ANEURIN BEVAN stated that the numbers of nursing staff employed in sanatoria and tuberculosis hospitals were as follows

	Full-time	*Part-time*
Trained nurses	2074	323
Enrolled assistant nurses	967	325
Student nurses	1372	—
Other nursing staff	1003	424
	5416	1072

Returns from local health authoritie engaged as tuberculosis visitors nr 360 full time and 1130 part-time

Mental-hospital Patients at

Mr S P VIANT asked the Home Se was adopted for the inoculation of persons contine hospitals who were rational in most respects and expressed objection to these injections and whether his regulations allowed such persons any right of refusal—Mr BEVAN replied There are no regulations for inoculation of persons in mental hospitals but if a patient expressed a rational objection to an injection it would not be administered

Cuts in Numbers of Registrars

Mr J K VAUGHAN MORGAN asked the Minister of Health what was the present establishment of hospital registrars and senior registrars for the South West Metropolitan region, and to what figure these would be reduced when the proposed cuts were implemented.—Mr BEVAN replied About 320 in each case (including the teaching hospitals in the area) The new figures are respectively 151 and 83

Mr NIGEL DAVIES asked the Minister whether he was aware that, whereas he had proposed that the number of hospital registrars and senior registrars in England and Wales should be cut from 2800 to 1700, it was proposed that the cut in the North East Metropolitan region should be from approximately 300 to 134, and what was the reason for this greater proportionate cut in this region.—Mr BEVAN replied The reduced number represents the share of the total which I think is appropriate to this region, taking into account its population the number of consultants the available training facilities, and the number of beds in that region as compared with the country as a whole

Specialist Training

Mr DAVIES asked the Minister whether, in order to ensure adequate training and fair opportunities for doctors seeking to become specialists he would arrange for a transfer system whereby registrars of non teaching hospitals should spend a portion of their training period at teaching hospitals and whereby registrars at teaching hospitals should spend a proportion of their time at non teaching hospitals—Mr BEVAN replied *I have already made this suggestion to hospital* boards

Expansion of Consultant Services

Mr E A. HARDY asked the Minister why he did not expand the consultant services to the extent proposed in the pamphlet, *The Development of Consultant Services*, published by His Majesty s Stationery Office—Mr BEVAN replied It is no use trying to increase the number of consultants faster than *we can increase the beds and other facilities available to them.*

Capitation-rate

Mr STANLEY EVANS asked the Minister whether he would revise his regulations so that general practitioners in the National Health Service were paid at a higher capitation rate in respect of the first 1000 or 1500 patients on their list, and at a lower rate as their lists became larger—Mr BEVAN replied I have myself always preferred the idea of a graduated system which would discourage the accumulation of over large patient lists and encourage the better balanced practices It is not always easy to translate it into fact but I want to go into it very thoroughly with the profession in my discussions with them

Kingston Victoria Hospital

Mr J A BOYD CARPENTER asked the Minister whether he had now considered the proposal of the British Medical Association that a public inquiry be held in connection with the dispute as to the future use of the Kingston Victoria Hospital and what action he proposed to take—Mr BEVAN replied The future of the hospital has been very fully and carefully reviewed both by the regional board and by the Ministry of Health, as well as having been the subject of debate in the House of Commons I certainly do not think that the proposed inquiry would either be appropriate or would add to our knowledge and I see no reason to intervene.

Mr BOYD CARPENTER Is the Minister aware that one of the major reasons why local opinion feels that injustice has been done is that no opportunity has yet been given for local opinion to express itself directly to those responsible? Would not a solution such as that suggested by the British

practic-
descral Association give an opportunity, so far denied, for hasal opinion to express itself ?—Mr BEVAN I do not believe that there exists in Great Britain any better court of inquiry than the House of Commons itself, especially on a matter of this kind If the hon Gentleman thinks that the matter has not been adequately ventilated he can seek further opportunities

Mr SOMERVILLE HASTINGS Would not the Minister agree that the opinion of experts in hospital management is more *important than local opinion* ?—Mr BEVAN Yes, of course This is the view which has been taken by the management committee and the regional hospital board, who have had all the facts before them, and, as I have said, the House of Commons as well If the matter is not yet sufficiently ventilated I shall be most happy to recount the facts again

Hospital Purchases

Mr ANTHONY GREENWOOD asked the Minister whether he would make a statement on the progress achieved in setting up a central purchasing organisation for hospital requirements —Mr BEVAN replied Central contracts are placed for X ray equipment and films, laboratory and blood transfusion apparatus, spectacles, rubber goods, and certain scarce and costly drugs Hearing aids are purchased under contract by the Post Office, surgical and orthopædic appliances by the Ministry of Pensions and occupational therapy equipment and invalid tricycles by the Ministry of Works I intend, as soon as practicable, to extend these arrangements to cleaning materials and hardware, bedding, cotton and woollen textiles, drugs and dressings and other common user goods Net savings cannot be precisely calculated but are not less than £2½ to £3 million

Diary of the Week

DEC 17 TO 23

Monday, 18th

INSTITUTE OF OPHTHALMOLOGY Judd Street W C 1
5 30 P M Dr H J Dartnall Visual Pigments

Tuesday, 19th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M (London School of Hygiene Keppel Street, W C 1) Prof F J W Roughton F R S Respiratory Chemistry of the Blood
INSTITUTE OF OPHTHALMOLOGY
5 30 P M Mr P McG Moffat Ocular Tuberculosis
EUGENICS SOCIETY
5 30 P M (Burlington House W 1) Mr Paul Bloomfield The Ideal of an Elite

Thursday 21st

BRITISH POSTGRADUATE MEDICAL FEDERATION
5 30 P M Professor Roughton Respiratory Chemistry of the Blood
ST GEORGE S HOSPITAL MEDICAL SCHOOL Hyde Park Corner S W 1
4 30 P M Dr M A Partridge Psychiatry lecture demonstration

Births, Marriages, and Deaths

BIRTHS

GRANT —On Dec 2, in London the wife of Dr R N R Grant—a daughter
HETREED —On Dec 2 in Cardiff the wife of Dr Vincent Hetreed —a son
HOLGATE —On Nov 28, in Leeds the wife of Dr J A Holgate—a son
HUTCHISON —On Dec 6 in Glasgow, the wife of Dr B S Hutchison —a son
RACE —On Dec. 1 in London the wife of Dr R R Race—a daughter
SHRIGLEY —On Nov 30 the wife of Dr J A Shrigley—a daughter
STONE —On Dec 5 in Manchester the wife of Dr Richard Stone—a daughter

DEATHS

CALDWELL —On Dec 3, at St Albans Alfred George Caldwell M D R U I D P H
DAVIES —On Dec 5 at Stroud Glos Albert Barnes Davies M R C S aged 89
EMERSON —On Dec 2, at Pershore Worcs Herbert Bree Emerson M R C S aged 82
FORREST —On Dec 7 at Harpenden Herts James Aquilon Forrest, M B Edin surgeon captain R N retd aged 79
FREW —On Dec 1 John Frew M B Glasg D P H
LAWSON —On Dec 3 in London Douglas Lawson F R C S lieut-colonel R A M C retd
MARTYN —On Dec 5 at Paignton Gilbert John King Martyn, B A M D Camb D P H aged 81

Notes and News

THE REGISTRARS

IN a statement issued at the beginning of this week, the Socialist Medical Association calls for immediate withdrawal of the Ministry of Health s recent circular on registrars "The Circular shows a total failure to understand the importance of the contribution made by registrars to the hospital service The Circular fails because it treats the question of registrars in isolation, instead of as an integral part of the whole problem of staffing the hospitals, and the other medical services The wholesale dismissal of registrars which it proposes will lead to an increase in waiting lists, diminish turnover, and in certain cases will lead to the closure of beds" The association takes particular exception to the proposal that registrars should join the Forces or the Colonial Medical Service, since it knows of no evidence that this country is over doctored The two main causes of the present disproportionate number of registrars are (*a*) failure to plan nationally the best use of medical man power, and (*b*) the increasing difficulty of entry into general practice The following are among the measures which, according to the association, are essential before present appointments are terminated (1) a national policy on the medical staffing of hospitals must be formulated, (2) the surveys now being made of hospital establishments should be expedited, (3) as soon as (1) and (2) are completed, the necessary expansion of the consultant services should be speeded up ("where it is found that registrars are in fact doing consultants work, consultant posts should be created and advertised"), and (4) hospital boards should be instructed to make no further appointments of part-time consultants The association claims that the suggestion, contained in the circular, that general practitioners should act as part-time clinical assistants, to replace registrars, is clearly impracticable Finally, the question of entry into general practice requires urgent reconsideration Here the association proposes (*a*) that the maximum number of patients on each principal s list be reduced immediately to 3000, (*b*) that the Medical Practices Committee be reformed, (*c*) that the constitution of local executive councils be changed so that vested interests cannot prevent recognition of the real needs of the area, (*d*) that local authorities be encouraged to give more help in housing new general practitioners, (*e*) that first consideration be given to encouraging entry into practice in the under-doctored areas by inducement payments, (*f*) that there should be a retiring age for all practitioners in the National Health Service, and (*g*) that the right to immediate free choice of doctor should be restored "We make these suggestions," the statement concludes, "without prejudice to our policy that fundamentally the solution to the problems of general practice is a salaried service based on Health Centres"

PARKINSON'S DISEASE

Mr Buchler[2] has been a sufferer from Parkinson's disease for 7 years and writes with the commendable object of helping his fellows In his case the affection was possibly a sequel, after 21 years, to an attack when he was in China of "black" smallpox, in which he states that he lay comatose for three weeks In view of the nature and object of the book he tells us very little about the various forms of treatment which he has received, and their comparative merits "My favourite assortment (taken separately three times daily) is thirty drops belladonna tincture and one tablet hyoscine Now I take 3 benadryl capsules daily" However, he advises a fortnightly visit to the doctor (and comments upon the antiquity of the literature supplied in the waiting rooms of many practitioners) one object of these frequent visits being to inquire after any new remedies A good deal of advice is given upon the method of walking, and the procedure when a parkinsonian does his own shopping,—but the author recognises quite candidly that the disabilities of the subjects of this disease are by no means uniform, and hence that the same method may not be suitable in all cases, certainly his recommendation to swing a stick, umbrella, or shopping bag as an aid to walking will not appeal to all I have always, strangely enough, found it easier to walk at night than in the daylight It would be interesting to know how general this

1 See *Lancet* Nov 11 1950 p 537
2 *Parkinson s Disease* Advice and aid for sufferers of Parkinson's Disease and other physical disabilities By WALTER BUCHLER London Walter Buchler 1950 Pp 79 5s 6d

cperience is among parkinsonians Undoubtedly it is true some cases and one wonders whether the difference is due, ot to any factor of light or darkness, but to some change in etabolism in the later hours of the day

A large part of the book is taken up with rather platitudinous ounsel about the conduct of life generally that would apply qually to the disabilities and limitations of normal old age hus the parkinsonian is advised upon the interest to be xpected from investments, the choice to be made among the imultaneous programmes of the B.B C, the characteristics f various newspapers, and the engagement of housekeepers, ogether with matters of more immediate import to him, such s the method of rising from the lavatory seat and the difficulties in the use of knife and fork Various suitable obbies are discussed, ranging from speculation on the Stock Exchange to the formation of a herbarium of weeds The book has an excellent index such as is lacking in many books which have much greater need for it, a random glance at the tems—astronomy cabbage, crossword puzzles, marriage, ocks, soles, soup, and so on—shows the breadth of the author s conception of parkinsonism

Mr Buchler is a professional writer and no-one will object to his use of the disease from which he suffers to provide another book He has written several millions of words on his typewriter, using one finger of each hand, a practice which he had adopted before the disease developed He has thus solved one of the greatest problems—that of writing as he says, "even to sign one's name becomes a hard job'

In the autumn of 1948 he read in a newspaper of a fellow sufferer in this country who had gone to the United States for an operation on the brain to be performed by a surgeon at St Louis and he decided to do the same himself although he does not appear to have known very much about the success of the operation on his fellow countryman Every parkinsonian will applaud his wisdom in travelling "tourist' and thereby evading the manipulative difficulties of dressing for dinner He goes on to give a topographical description of the *Mauretania*, in so far as the ship is accessible to passengers, and pays a tribute to the immediate help in every difficulty which he received from the staff In New York his medical advisers decided against the proposed operation and he returned by air Certainly if a man, travelling alone, can cross the Atlantic by ship and by plane with great enjoyment, his disabilities do not justify an operation of which the risks and effects are but little known In conclusion one may congratulate the solitary traveller on his courage and his American friends on their wisdom in sending him home intact.

A NEW MEDICAL JOURNAL

THE first issue of *Medicus*, which has just arrived from Pakistan, contains articles by European as well as local workers Mr D M Stern, of the West Middlesex Hospital, discusses the use of veratrum viride in eclampsia Dr M A Shah and Dr G M Awan, of Karachi, describe the treatment of trachoma with benzyl cinnamate and Dr A R Piracha deals with cardiac emergencies The other articles include a note on Love as a Medical Problem in the historical section which is to be a regular feature The editor Dr M. S Quereshi, F.R.C.S.E, M R C O G will have the help of an editorial board consisting of Prof Shiyaat Ali Prof. Muhammad Basheer, Prof Y M Khan Prof N A. Quraishi and Prof Muhammad Yusuf Dr Quereshi says that *Medicus* is intended to satisfy the great need for a really good medical journal in Pakistan Judging by the first issue, it is likely to succeed

BRISTOL FASHION

BOOKLETS on local health services are often as indigestible as cold suet pudding and about as dispiriting In tempting his fellow citizens to know and use the amenities of the Bristol health department Dr R H Parry[1] the medical officer of health shows the resource and sagacity of a Mrs Beeton garnishing his plain dish of facts with such well chosen pictures, and such an appetising display of good paper and type that all must relish it The health services in Bristol are presumably of the same order as those elsewhere but this book reveals the pride the health department takes in them and the thoroughgoing efforts made to tell people about the care to which they are entitled They are told who is responsible for every section of the department's work, and where to apply for help in any necessity or emergency to do with health The pictures interpreting the text have been gathered from various sources, including *Illustrated*, *Topical Press*, and the Bristol *Evening Post* and *Evening World*, and they have what is called in the trade "human interest" The danger of human interest is sentimentality, but these pictures avoid it They bring to mind that Bristol is a seaport that people live in good houses and bad, that children are by nature confident, that old people like company, that a dentist at work can provide a satisfying æsthetic pattern—anyhow for the looker on They are, in current slang, just the job

1 Health Services in Bristol Department of Public Health City and County of Bristol Pp 38 1s

DEATH OF MR BARTLETT

IN *Did Adelaide Bartlett ?*[1] Gordon Gwyn (a pseudonym concealing the identity of a practising anæsthetist) picks up the thread of an unsolved mystery of the '80s, and attempts to unravel it in the light of modern medical knowledge In a manner by turns light hearted and dramatic, he unfolds the story of the strange marriage of immature Adelaide de la Tremoville to pompous Edwin Bartlett with his odd ideas about the marriage bed The familiar triangle is completed by a particularly ingenuous cleric, and the story moves to its climax with the strange but expected death of the husband The manner of his death clearly needs an anæsthetist to explain it, and Gordon Gwyn discusses ably the evidence at the trial and gives his own conclusions The main facts are taken from the authentic records, and the manner of presentation is up to the standard of the better mystery stories of fiction

"YOU AND YOUR HEART"[2]

FIVE American authorities have collaborated to produce a book whose aim is to give the layman a concise non technical explanation of the heart and circulatory system, believing that in this way they may prevent over anxiety in the patient with heart-disease and in his relatives, and put at rest the fears of those in whom heart trouble is only imaginary They also give some general rules about the mode of life to be adopted by the patient, always with the emphasis on encouragement and optimism Finally they discuss prevention, and give a brief account of the most pressing problems in the care of patients with cardiovascular diseases and the American organisations attempting to solve them They cover the anatomy and physiology of the circulation, congenital coronary, and rheumatic heart-disease high blood-pressure, and diseases of the peripheral blood vessels

It is difficult to know how much a book of this type however clearly and simply written, would help the layman of this country In the introduction doctors as a group" are described as "unable or unwilling to explain clearly, in simple terms, some of the things that patients most want to know" If this is so perhaps it is the doctor rather than the patient who should read this book.

MAN-EATING SHARKS

Mr V M Coppleson of Sydney, states that each year about 4 or 5 attacks are made by sharks on human beings on the coast of Australia[3] There have been 77 attacks on bathers in the last thirty years and 33 on pearl divers in the ten years 1926–36 There is also evidence that sharks sometimes eat dead bodies Attacks have often been made on manned rowing boats and on such occasions the shark is apt to lose a tooth by which the species (always the Blue Pointer in Australian waters) can be identified Sometimes human limbs have been recovered from sharks' stomachs after the lapse of more than a week and have then shown strangely few signs of digestion

Thirteen years ago the experiment was made of laying a long net off the beach each evening and hauling it away by trawler each morning Areas so meshed' have since been completely free from attacks by sharks on men Though the risk to bathers is numerically infinitesimal these accidents, as Mr Coppleson says, are horrible and the victims are usually people full of life and youthful vigour

1 London Christopher Johnson 1950 Pp 180 9s 6d
2 By H M MARVIN M D T D JONES, M.D I H PAGE M D I S WRIGHT M D and D D RUTSTEIN M D New York Random House 1950 Pp 306 $3
3 *Med J Aust* Nov. 4 1950 p 680

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SMYTH M. J M CH N U I F R C.S consulting surgeon Jockey Club and consulting surgeon National Hunt

Appointed Factory Doctors

MOLONY J G M M B Dubl Truro district Cornwall
PEARSON JAMES M B Glasg Paisley district Renfrew

THE FUTURE OF THE PRACTICE OF MEDICINE *

A LESLIE BANKS
M A Camb, M.D Lond, F R C P, D P H.
BARRISTER AT LAW, PROFESSOR OF HUMAN ECOLOGY, UNIVERSITY OF CAMBRIDGE

It was, I think, Winston Churchill who said that to look forward one must be able to look back As one who has studied either actively or passively the conduct of medical practice in this country over the past twenty five years, and has lately been inquiring into the problems of rural practice in East Anglia and the West Country, it is my considered opinion that the standard of medical care both in hospital and in general practice is infinitely better today than it was formerly

Take for example, the various aids to diagnosis Some twenty years ago clinical bacteriology and biochemistry were in their infancy and the full-time specialists in these branches were still pioneers in the teaching hospitals In many hospitals the work was done by a technician supervised by a part time pathologist who might be either an assistant physician to the hospital, a general practitioner in the town, or the local medical officer of health X ray departments in the smaller hospitals were commonly run by the X-ray sister, who might also be the outpatient and casualty department sister A part time radiologist would visit once or twice a week A blood transfusion was still a major event and the full time practice of anæsthetics was usually limited to the big hospital centres Registrars were few, and much was left to the house surgeon or house physician

I have still the most vivid recollection of two resident medical officers, one aged 24 and the other aged 22, attempting to operate on a difficult mastoid at a busy provincial hospital The younger R.M.O gave the anæsthetic, his first since qualification, and emerged from under the towels to tell his colleague that the patient was in a bad way—only to find that the latter had opened the lateral sinus The patient made an uncomplicated recovery

On another occasion no member of the surgical staff of this hospital was available to operate on a fulminating appendicitis in a fat patient, and the young R.M.O had to do this with the aid of the theatre sister By way of contrast, when the young man returned to his own teaching hospital a fairly skilled operator, he found that house surgeons were not allowed to make even an incision for the first three months of their residency

Outside the hospital equally great contrasts were to be found General practitioners varied in quality from those in the slum areas who referred every case to hospital to those in rural areas who were prepared to tackle everything from removal of the gall bladder or radical mastectomy to a tennis elbow Poor law medical officers were still paid at the rate of £40–100 per annum, and for this sum might be expected to supervise the entire sick of a poor law infirmary, including the practice of midwifery, the care of children, and the septic block The "operations book" of the infirmary of a country workhouse sometimes provided lively play for the imagination

This uneven picture was changing rapidly during the 1930's and the outbreak of war in 1939 heralded the break up of the earlier system The advances of the past few years are too well known to require detailed description The antibiotics, advances in blood transfusion and anæsthesia, and the development of team-work in hospital have made "impossible" procedures matters of everyday practice To give only one example, an article has recently appeared in the *British Medical Journal* describing a series of cases in which mitr stenosis had been relieved by the insertion of a fing into the left auricle and stretching the stenosed valv And this at a time when the standard textbooks st mention the application of leeches[1] Dramatic clinic advances tend to obscure the effects of public heal measures, but these are shown in many ways Th isolation hospitals built only a few years ago to accomm date 100 or 200 patients may now have a yearly avera of 12–20 cases Maternal and infant mortality and t number of stillbirths continue to fall rapidly, and v have not yet seen the full effects of better housin improved nutrition, and more enlightened teaching physical and mental health

In 1860 Oliver Wendell Holmes wrote a series of medic essays,[2] in which he said

"There are, of course, in every calling, those who go abo the work of the day before them, doing it according to t rules of their craft, and asking no questions of the past or the future, or of the aim and end to which their special labo is contributing These often consider and call themselv 'practical men' They pull the oars of society, and have leisure to watch the currents running this or that way theorists and philosophers attend to them In the mea time, however these currents are carrying the practical me too, and all their work may be thrown away, and worse tha thrown away, if they do not take knowledge of them and g out of the wrong ones and into the right ones as soon as the may It is not only going backward that the plain practic workman is liable to, if he will not look up and look around he may go forward to ends he little dreams of And s with subtler tools than trowels or axes, the statesman w works in policy without principle, the theologian who wor in forms without a soul, the physician who, calling himself practical man, refuses to recognise the larger laws whic govern his changing practice, may all find that they have bee building truth into the wall, and hanging humanity upon t cross"

At no time in the history of our ancient profession h it been more necessary for the "practical man" to loo up and look around The armamentarium of the doct is being added to every day The diseases that he treat are undergoing modifications visible to all The change in the people who form his patients and in the condition under which he works are less obvious

CHANGES IN PATIENTS

Perhaps the most obvious change in the patients their increasing age Already more than 10% of th population of this country are over sixty five years age, and this proportion is increasing rapidly Therefor the patients of the future may be expected to include much larger number of chronic and degenerative diseases and the frail and infirm

Geriatrics is a term to which it may be possible t attach undue emphasis When a man reaches the ag of sixty five he will count himself fortunate if he ha more than fifteen years to live What does he wan during those years? Is it reasonable comfort, food shelter, and relief from the more serious disabilities Or does he expect to be entirely reconditioned like second hand motor car? Many people both inside an outside the medical profession are busily engaged i pointing out that the country can afford to spend onl a certain amount on medical services Their proposal as to how this money should be allocated are not alway clearly expressed, but all will agree that any proposa to spend large sums of money on elaborate services fo the care of the aged needs careful scrutiny if it is to b at the expense of the young Recent research in th Department of Experimental Psychology of Cambridg University has shown that the process of ageing begin

* Part of a contribution to a discussion by the Cambridge Medical Society on June 30

1 Baker C, Brock R C Campbell J M H *Brit med J* 1950 i 1283
2 Currents and Counter-currents in Medical Science Boston an New York, 1891 pp 175–177

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Appointed Factory Doctors

MOLONY J G M M B Dubl Truro district Cornwall
PEARSON, JAMES M B Glasg Paisley district Renfrew

disappointed Where can they go ? The Armed Forces, the Colonial Service, and the Colonies will absorb some, but the Colonial demand will diminish because they are training their own men on the spot

It is vaguely assumed that the men not required in the hospital world will enter general practice Is this a safe assumption ? And what attraction is there in general practice for a man who has spent a number of years in hospital unless there is a likelihood of a hospital appointment going with the practice ? Apart from this, are there in fact many openings in general practice ? The answer is No and the reasons are not hard to find First and foremost the size of the general practitioner's "pay packet" in the National Health Service depends on the numbers on his list "The more" so to speak, "the merrier" and so men must aim at quantity and not quality Next comes the fact that many elderly general practitioners cannot afford to give up The value of their savings, if any, has declined and they cannot claim a pension under the new service Thus a number of men (one estimate is as high as 6000) of ages ranging from fifty five to over eighty must continue to work *Many other factors also come into play If a* man is to retire where is he to live ? If he cannot get a house elsewhere he will stay where he is

Meanwhile the supply of young doctors continues undiminished and medicine continues to be regarded by fond parents as sufficiently attractive to justify heavy sacrifices for their sons and daughters

A DECLINE IN QUALITY ?

The dangers of the present position are not, therefore, confined to a temporary and non recurrent crisis but threaten the whole future of the medical profession and the practice of medicine Not the least of those dangers is the possibility that the State may be forced, on the grounds of economy, to make cuts in hospital staffs which will have the effect of imposing rigid "establishments" and a hierarchy on Service lines which will cramp or sterilise new developments

It is in the maintenance of the quality of medical care that the most urgent consideration is required The practice of medicine, like the law, has been built on the traditions of independent practice wherein competition and the prospect of financial rewards have stimulated each man to do his best for his patients Myself," said Jeff Peters,[8] "I never believed in taking any man's dollars unless I gave him something for it —something in the way of rolled gold jewelry, garden seeds, lumbago lotion, stock certificates, stove polish, or a crack on the head to show for his money" Removal of the personal incentive will, for many men, take off the fine edge of skill It can be argued that most people in this country are salaried That is true, but most people in this country do not need to work always at concert pitch nor do they carry the lives, or more important, the health and happiness of their fellows as their daily responsibility Quite apart from this question of incentives is the maintenance of accuracy under pressure Perhaps the most urgent clinical need at present is the early diagnosis of malignant disease Who is the more likely to achieve this ? The man with 5 patients waiting to be seen or the man with 35 ?

WHAT DOES THE GENERAL PRACTITIONER WANT ?

Doctors usually make poor administrators, mainly because they have never learnt to express themselves in terms which the layman can understand The need which all doctors feel for a closer integration between the general practitioner and the hospital is a good example Very few people outside the medical profession understand the real nature of the problem, and indeed many doctors have only a hazy notion

8 Conscience in Art. Complete Works of O Henry 1928

First what does the general practitioner want ? Is to be a good all round practitioner, or does he wa to be a specialist ? If the former, then his needs clear and can be simply expressed in one word— wants time Time to examine his patients properly, ti to read, time to think, and time to discuss recent advan with his colleagues

It is possible to gain time in various ways—in sp of Henry Ford's dictum that time is the only commodi that if wasted cannot be salvaged The health cent can be dismissed as a practical consideration, since, apa from expense, no one has yet a clear conception what it should be, nor have doctors and dentists y signified their willingness to work in these centres Th is perhaps just as well, for the isolation of general pra titioners in health centres divorced from their colleagu in consultant practice would not be in the best intere of clinical medicine By sharing clerical, nursing, a housekeeping assistance much of the drudgery of gener practice could be eliminated That is the essence group practice Time might also be saved by discardi firmly non medical and irrelevant work The gener *public would soon learn that this is to their advantage*

Alternatively does the general practitioner want al to be a specialist ? If so how does he propose to about it ? The acid test for any general practition who considers that he is equipped to specialise is, pr sumably, to ask himself whether his colleagues wou entrust their wives and children to his care in th specialty

In order to extend his responsibilities the practition must have ancillary aids to diagnosis There has bee much loose talk both within and outside the medic profession about direct access by the general practition to X ray, pathological, and physiotherapy departmen in hospitals At the request of the Nuffield Provinci Hospitals Trust some of my colleagues and I have bee inquiring recently into these possibilities, and althoug our inquiries are not nearly completed some facts a already emerging First it is clear that the speci departments in some hospitals cannot cope adequatel with their own inpatient and outpatient demands, an that in the absence of new building it would be physicall impossible to extend the resources of these department to those outside the hospital Even where the consultant and specialists are willing and the facilities are available such safeguards as an appointments system, a writte report by the doctor, and limitation of the investigation to certain categories will be necessary Thus everyon agrees that the general practitioner should be able t obtain an X ray report in pregnancy or for a doubtfu chest What more does he want ? Fractures ? If so i he prepared to treat them ? Peptic ulcer ? If so is h going to assess the progress of the ulcer by X ray examina tion every two months ? Kidneys and gall bladder If so, what does he propose to do when abnormalitie are found ? Similarly with pathological investigation Blood counts and pregnancy diagnosis tests are essentia for the general practitioner in certain instances Bu who is to decide what other types of investigation th general practitioner needs and how much responsibilit is he prepared to carry ?

Opinion among the consulting staffs is by no mean united Many physicians and surgeons feel that if they are to treat a case they would like to see it from th beginning and not after it has been handled by someon else It would be harmful to all for the general practitione to carry the patient for a certain distance and dump i on the consulting staff with a request that they shoul be responsible from then on

Again, general practitioners want, and rightly, hospita experience Are they to obtain this as clinical assistants or do they expect to have beds of their own in hospital ?

in the early thirties Is it not to the postponement of the ageing process that we should devote our main efforts ?

The effects of improved social conditions on health are already visible in the clinical field Such diseases as chlorosis have long since joined the historical section of the textbooks, but what of the conditions such as mucomembranous colic, visceroptosis, and the other neuroses so common in young women only a few years ago ? How often are really serious malnutrition and septic skin conditions seen in children today ? How many grossly deformed rheumatoid arthritis cases are now seen as compared with twenty years ago ? Where is the desperately ill young rheumatoid arthritis patient ? It is clear that sensible clothing, teaching of correct posture in childhood, fresh air and exercise, and improved working and housing conditions are producing young men and women of incomparably better physique than was the case twenty years ago These young people are, in spite of the jibes about football pools and strip cartoons and the like, better educated and more alive to health measures than their forebears It is doubtful whether it will be possible in the future for a surgeon to earn, like one of my former chiefs, a reputation for breaking down adhesions by manipulation without an anæsthetic "The secret, my boy," he used to say, "is stiffly starched cuffs and loose cuff links" Needless to say he was a man of outstanding personality

The real problems of the future lie in the middle aged groups The speed and stress of modern life tell particularly on those holding executive responsibility, whether as managing director or works foreman It is already clearly shown in the incidence of peptic ulcer, which in 1947 accounted for eight out of every thousand people ill during an average month and caused twenty six out of each thousand days of incapacity [3] Coronary thrombosis, and psychosomatic disorders of the skin, circulatory and digestive systems may be expected to take the place of the more simple functional symptoms of earlier generations

A MORE COMPLEX MEDICAL ORGANISATION

The care of the patient in the future will require a far more complex organisation than in the past Teamwork and specialisation in hospital will require to be coördinated with care in the home and at work The need to treat the whole patient with due regard to the psychological aspects of his disease requires full investigation of his social background, and the almoner and other social workers are now indispensable members of the medical team Much valuable hospital accommodation is at present wasted because patients are admitted unnecessarily or stay too long It is probable that the general hospital of the future will become a highly specialised diagnostic and treatment centre with patients transferred to simpler accommodation for aftercare This comment applies particularly to the long stay cases

The treatment of carcinoma of the rectum at St Mark s Hospital in London provides a good example of the results of team work. The surgical staff of this hospital have developed the method of synchronous combined excision of the rectum whereby two expert surgeons work together one through the abdomen and the other from the perineum In 1939 the operability rate (i e, resectability) was 63% In 1949 it was over 96% The average at other hospitals throughout the country is of the order of 30% The operative mortality for cancer of the rectum is shown by the British Empire Cancer Campaign figures to be from 15 to 50% in various hospitals At St Mark s Hospital it was in 1949, only 9% This figure includes all the surgeons there and all the "bad risk" cases [4]

CHANGES IN THE MEDICAL PROFESSION

While the weapons of attack upon disease and the reactions of the patients have changed, it is the medical profession which has undergone the most startling revolution Within the past two years this traditionally conservative profession has been placed, as it were, in a gigantic centrifuge which is still spinning rapidly The effects are not yet fully visible, but they are clearly disruptive and may be catastrophic

Take first the consultants and specialists Until two years ago the would be consultant achieved his objective in the teaching hospital by a combination of ability, tenacity, and luck. The non teaching hospitals were staffed by those who had been through the teaching hospital mill or who had graduated from general practice. The senior physician of one large provincial teaching hospital, a man respected and loved by all, began his career by purchasing a derelict practice in the town from a drunkard for a few pounds Slowly and by sheer ability and integrity he has climbed to a position of eminence

What is the picture today ? First comes the desperate scramble for a higher qualification It is of interest to note that of the many hundreds who sat for the M.R.C.P (London) 35 passed in May of this year and 47 in February Next comes the scamper for the training ladder Those who succeed in getting both feet on this expect to climb rapidly until at the mature and experienced age of thirty two they may assume, by virtue of a "contract," the responsibilities of an Osler, a Moynihan, or a Bland Sutton Meanwhile the channel of recruitment from general practice has been completely blocked

It is not surprising that the young men fresh from the medical schools all want to be consultants In the past two years contracts (*quid significat, sonat haec vox* ?) have been issued to consulting staffs of all hospitals Most of these men fall between forty five and fifty five years of age This means that for the next ten to fifteen years there are going to be very few vacancies There are no national estimates, and a leading article in *The Lancet* [5] has emphasised the urgent need to publish the facts for England and Wales and to form a policy thereon [6] The results of my own inquiries agree substantially with the findings of the recent Scottish Survey [7] Thus in one large hospital region—mainly industrial—it has been estimated that for the next ten years the consultant requirements *in all branches* will be 5 for each year and after that 10 a year If this picture is typical of the whole country, the requirements of the fourteen regions in England and Wales will amount to 70 vacancies each year for the next ten years and 140 a year at the end of the ten year period If a specialist "establishment" of consultants and senior hospital medical officers of 7000 (which is more than the number now in post) is accepted as not unreasonable, a wastage of 3% per annum would result in a total of 210 vacancies per annum The truth probably lies somewhere between these two estimates—i e, between 70 and 210 vacancies each year These figures take no account of dilution by non medical personnel, lower or specially created grades, or a resuscitation of the general practitioner specialist At present about 1539 senior registrars, 1477 registrars, and 790 junior registrars are employed in hospitals in England and Wales Many of these young men are going to be

3 Sickness in the Population of England and Wales in 1944 47 Studies on Medical Subjects no 2 H.M. Stationery Office, 1949, p 49 and table 15

4 Personal communication from Mr O V Lloyd Davis M.S., F.R.C.S

5 *Lancet* 1950 I 1157

6 The Ministry of Health in circular R H B (50)106 dated Nov 6, 1950 has now laid down that the number of training posts (i e registrarships) is not to exceed 600 senior registrars and 1100 registrars The Ministry action is based on the estimate that the number of appointments available to senior registrars who complete their training in England and Wales is unlikely to exceed 150 a year for some years to come. This includes not only consultant and senior hospital medical or dental officer appointments necessary to make good wastage through death or retirement but also a proportion of additional posts and openings in other services and overseas as well as hospitals in this country

7 *Lancet* 1950 I 1165

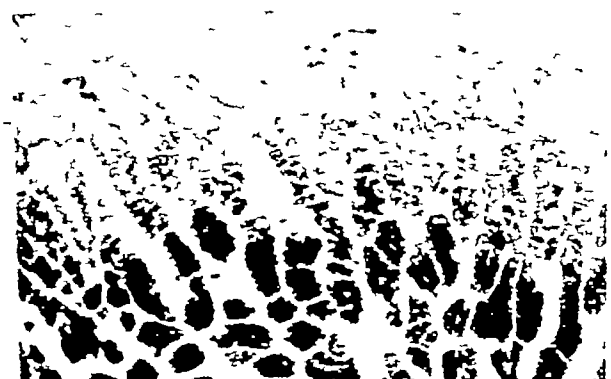

Fig 1—Biopsy specimen of normal mucosa of body of stomach Section extends down to muscularis mucosæ Superficial quarter of mucosa shows mucus-secreting surface epithelium extending down into shallow pits. Rest of section is made up of tubular gastric glands with darkly staining pepsin-secreting chief cells and lightly staining acid-secreting parietal cells (Methyl violet-orange G Ponceau-phloxine and methyl green.) (×105)

there is a well-defined picture of pernicious anæmia in the peripheral blood It is the opinion of many observers, and it is also our opinion, that subacute combined degeneration of the cord may occur with no significant changes in either the peripheral blood or the bone-marrow

To achieve early recognition of those cases of subacute combined degeneration of the cord where the neurological manifestations are but slight or equivocal, and where the blood changes are minimal or inconclusive, it is necessary, besides detailed neurological examination, to make full use of every additional procedure which may shed light on the diagnosis

It is the purpose of this study first to emphasise the proper assessment of dysæsthesiæ referred to the extremities, secondly to discuss the early changes in the bone marrow in pernicious anæmia, and finally to add a further aid in diagnosis—gastric biopsy As regards gastric biopsy, it has been our experience that all patients with subacute combined degeneration of the cord and/or pernicious anæmia show considerable atrophy of the mucosa of the body of the stomach associated with histamine fast achlorhydria The nature of the biopsy fragments thus serves as a valuable guide to the correct diagnosis

Thus at the outset we may define our attitude towards certain points which have been the subject of controversy —whether subacute combined degeneration of the cord may be associated with the presence of free hydrochloric acid in the gastric contents, and whether any form of anæmia other than the pernicious type may be present

We believe that the cause is one which tends also to lead to pernicious anæmia and in which histamine fast achlorhydria is constantly present These are the only cases which we see in Australia If the term is used in this sense it symbolises a rigid concept If, however, the term is used in a literal sense, it may include degeneration of the white matter of the cord due to other causes In these cases free hydrochloric acid may be present in the gastric contents, but only older reports suggested that such cases exist (Grinker 1926) However, we have no personal experience of such cases and believe that they belong to a different group Secondly, if microcytic anæmia be present, we believe that it is due to other causes commonly leading to anæmia of this type and not directly associated with the disease

The cases selected are, in the main, those referred to one of us (E G R) for neurological consultation. Cases with frank pernicious anæmia have not been included for they present no serious diagnostic problem

EARLY CLINICAL MANIFESTATION

Subacute combined degeneration of the cord present in various forms We shall not here describe the picture which arise from degeneration in the white matter of the cord and in the peripheral nerves Suffice it to say that sometimes the signs may suggest such diverse conditions as spinal compression and peripheral neuritis

In advanced cases the diagnosis is usually obvious and confusion is unlikely unless the blood picture is normal or nearly so Careful inquiry may, however, elicit a history of dysæsthesiæ affecting all four limbs at an early stage, before the patient recognised the insidious approach of illness He complains less of these as time goes on—possibly because they become less obtrusive possibly because his incapacitating symptoms assume such importance

The patient with subacute combined degeneration often seeks medical attention during the early stages Because his complaint is vague and does not indicate the impending gravity of his condition, a diagnosis of neuritis is usually made and he is treated with vitamin B_1 Indeed these symptoms may be due to degeneration of the peripheral nerves in subacute combined degeneration The presence of demyelination of peripheral nerves in this disease was demonstrated by Greenfield and Carmichael (1935) The reduction of myelin was of the same type as in alcoholic neuritis This diagnostic difficulty may be illustrated

Case 1 —A man, aged 63, had noticed that his finger-tips became unusually cold during the last two winters Twelve months ago his fingers had felt numb and puffy and were clumsy During the last six months his lower limbs had felt stiff More recently, on rising in the morning, his legs had felt numb from the waist down. When kneeling he had felt as if he was kneeling on bare bone and there had seemed to be tight bands round his knees

Examination—In spite of the obtrusive nature of the dysæsthesiæ, little was found on examination. There was slight ataxia of the lower limbs Power, tone, and reflexes appeared normal Vibration was not felt over the knees and ankles or over the sacrum and lumbar spinous processes This sensation was also diminished over the hands The threshold for two point discrimination was slightly increased There was no muscular tenderness The mucosa of the tongue was slightly atrophic The cerebrospinal fluid was normal, and a histamine test-meal showed achlorhydria The peripheral blood and sternal marrow were normal, but the patient had been receiving intermittent liver therapy, which had been instituted without examination of the blood

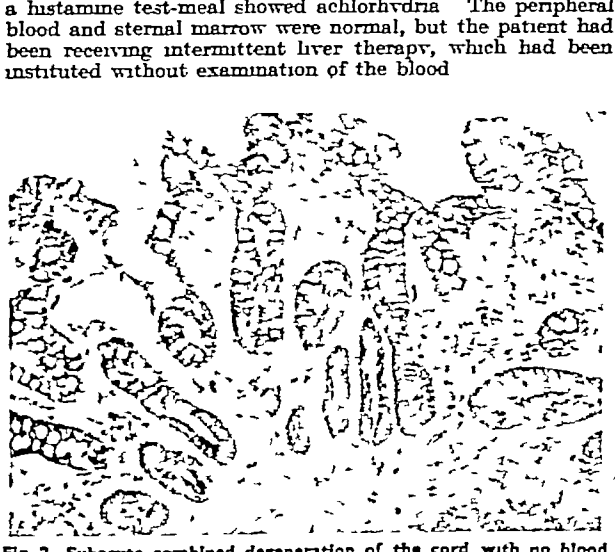

Fig 2—Subacute combined degeneration of the cord with no blood changes (case 3) Biopsy specimen of mucosa of body of stomach showing thinning disappearance of chief and parietal cells and metaplasia to columnar epithelium of intestinal type with plentiful goblet cells. There are no excess wandering cells in supporting stroma. (Stain as in fig 1) (×105)

are to have beds in hospital, what kind of patient y treat there? Only the doctors themselves can answer these and similar questions, and until they make up their minds they cannot expect the layman to do it for them

The question of access to hospital is a particularly difficult one The day of the single handed consultant and specialist in hospital is over He is a member or the head of a team This is well shown in such a specialty as diagnostic radiology In one large London teaching hospital the head of the department deals almost entirely in medical work He has, in his department, one assistant specially trained in neurological work, and another in orthopædic work There is also a tendency to specialise within this department in gastro intestinal or chest examinations Accurate radiology depends on meticulous technique which requires long experience, and it is difficult enough for the specialist to keep abreast of recent advances such as angiocardiography and the possibilities of examination with more selective contrast media It is still more difficult to keep abreast of all recent advances in medicine and surgery and to pass that information to the busy general practitioner It is clear that the days of Abernethy are over and that the Pooh bah is an anachronism

It is also true that the practice of medicine cannot follow the artificial administrative divisions of a National Service The general medical practitioner's work lies mainly outside the hospital, but he must be able to go in and out as he wishes—not in order that he may obtain a "contract" but because he is vitally interested in the patient that he sends in Alternatively he may possess real ability in some special subject which, for the benefit of all, should be developed and extended In the same way, the consultant and the specialist must be able to go outside hospital at will, either in person or through some other member of their team such as the almoner or social worker Any attempt to build an administrative wall round the hospital will only result in harm to the practice of medicine

A most interesting report on "The Quality of Medical Care in a National Health Program" issued in the United States [9] says that the general practitioner, if given complete consultant reports, "can usually continue with the management of all but the most specialised therapeutic procedures" Some hospital boards and medical societies in the United States have already general practice sections and a "specialty board" in general practice is under discussion The report advocates the abolition of the closed staffing of hospitals and makes the revolutionary proposal that all licensed practitioners should be allowed to utilise the hospital provided they are restricted to activities within their scope and supervised and aided in their work by the whole professional staff of the institution

REQUIREMENTS FOR THE FUTURE

Some of the views expressed in this American report are in line with the recommendations of the Cohen Committee on General Practice [10] and other recent British reports, and it is gradually becoming possible to discern the requirements of the future I suggest that the following points are of fundamental importance

1 The patient of the future will need to be studied in relation to his mental and physical environment That environment includes home, work, and leisure
2 To do this adequately a number of existing barriers, many of which are artificial and of administrative importance only, must be broken down or ignored
3 The developments of further specialisation in medicine should be discouraged in favour of flexibility
4 The general medical practitioner should be relieved of all non medical burdens and encouraged to develop interests within the hospital and in industrial and preventive medicine
5 There should be no obstacles, administrative or otherwise, to the free access of the hospital team, including the almoner, to the home
6 The general public should be told, preferably by the doctors themselves, that "medical shopping" may if unchecked result in "utility" medicine
7 The maintenance of high standards of medical practice in the future will also require (a) The avoidance of "dilution" or creation of inferior medical posts to replace the more costly expert, and (b) close association between the medical schools, the research worker, the hospitals, and those engaged in domiciliary care

We are approaching yet another series of crises in the struggle by the medical profession to adapt itself to an unstable environment When the emotions are let loose it is difficult to take a long view On the one side are the research departments with ever advancing knowledge of mind and body On the other is the general public representing what it is now fashionable to call the consumer interest

Many doctors would also include "they" in this picture —thereby implying those sinister figures whose purpose is supposedly to thwart the free practice of medicine. There is no doubt that an independent and outspoken minority in the community may form an administrative and even a political headache, but it is equally certain that no layman wants to carry the clinician's responsibility As long as the doctor maintains his skill and dignity so long will he retain his guardianship of the future of the practice of medicine The moment that he lowers his standards, or allows others to do so for him, medicine ceases to be an art and the disciples of Hippocrates become technicians The number of people who would wish to see that happen must be very few indeed. Certainly the patients, actual or potential, do not want this

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9 The Quality of Medical Care in a National Health Program *Amer J publ Hlth*, 1949 39, no 7 July See *Lancet* Nov 18 1950, p 589
10 General Practice and the Training of the General Practitioner London British Medical Association 1950

EARLY DIAGNOSIS OF SUBACUTE COMBINED DEGENERATION OF THE CORD

VALUE OF GASTRIC BIOPSY

R K DOIG* M B Melb
R MOTTERAM* M B, B Sc Adelaide
E GRAEME ROBERTSON M D Melb, F R C P, F R A C P
I J WOOD* M D Melb, F R C P, F R A C P

From the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and the Royal Melbourne Hospital

SUBACUTE combined degeneration of the cord, if untreated, progresses inevitably to a crippling conclusion. The march of symptoms may occasionally be extremely rapid Hence early diagnosis and adequate therapy are essential However, in Australia at any rate, there are few conditions which so often escape diagnosis until an irrecoverable stage is reached Delay in diagnosis usually results from (1) failure to recognise the significance of peripheral dysæsthesiæ, which may precede other manifestations by many months, and (2) a reluctance to diagnose subacute combined degeneration of the cord unless

* Aided by a grant from the National Health and Medical Research Council of Australia

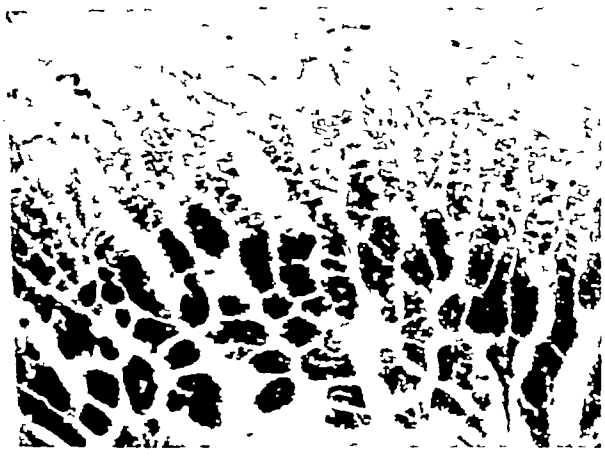

Fig 1—Biopsy specimen of normal mucosa of body of stomach. Section extends down to muscularis mucosæ Superficial quarter of mucosa shows mucus-secreting surface epithelium extending down into shallow pits. Rest of section is made up of tubular gastric glands with darkly staining pepsin-secreting chief cells and lightly staining acid secreting parietal cells (Methyl violet-orange G Ponceau-phloxine and methyl green) (×105)

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I J WOOD* M D Melb, F R C P., F R A C.P

From the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and the Royal Melbourne Hospital

SUBACUTE combined degeneration of the cord, if untreated, progresses inevitably to a crippling conclusion The march of symptoms may occasionally be extremely rapid Hence early diagnosis and adequate therapy are essential However, in Australia at any rate, there are few conditions which so often escape diagnosis until an irrecoverable stage is reached Delay in diagnosis usually results from (1) failure to recognise the significance of peripheral dysæsthesiæ, which may precede other manifestations by many months, and (2) a reluctance to diagnose subacute combined degeneration of the cord unless

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ithout evidence of either of these two diseases showed lesser degree of thinning of the body mucosa and less trophy of the chief and parietal cells Intestinal metaplasia was rarely seen, wandering cells including polymorphs were numerous, and there was flattening and ometimes desquamation of the superficial epithelium Ve have applied the term "chronic catarrhal gastritis" o this appearance

Thus the distinction is not absolute but depends on he assessment of changes present in various proportions Nevertheless we have found biopsy of the stomach mucosa to be a valuable additional aid to diagnosis It may confirm doubtful cases of subacute combined degeneration, or may exclude chronic alcoholics with peripheral euritis and with histamine fast achlorhydria due to a atarrhal type of gastritis Gastritis associated with lcoholic excess usually shows only a mild superficial ellular infiltration with minimal change in the tubular astric glands but in some cases there may be a pronounced catarrhal gastritis with atrophy Peripheral euritis and histamine fast achlorhydria associated with hronic alcoholism are illustrated by the following case

Case 2 —A woman, aged 54 was admitted to hospital ith five months history of increasing weakness, pins and needles, and cramps in the legs For the past two months she ad been unable to walk without assistance She had drunk onsiderable quantities of alcohol during the past year, and

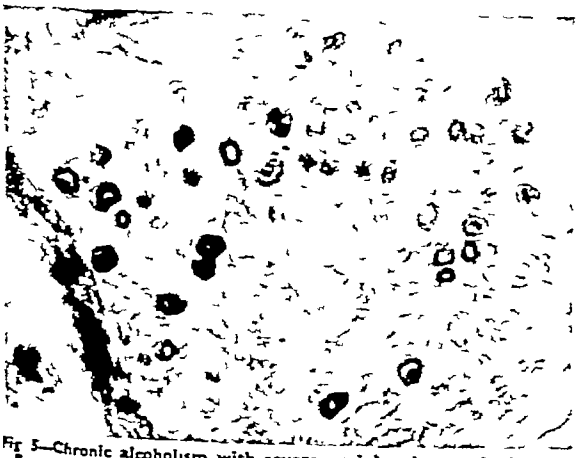

Fig 5—Chronic alcoholism with severe peripheral neuritis (case 2) Biopsy specimen of internal branch of anterior tibial nerve showing gross reduction in number of myelin sheaths. (Osmic acid) (×490)

er diet had been most inadequate, particularly in first-class protein and vitamins

Examination revealed mental confusion general muscular weakness and enlargement of the liver There were weakness of the lower limbs, tenderness and wasting of the calf muscles absent deep reflexes and flexor plantar responses There was some diminution in appreciation of pinprick and vibration in the lower limbs A histamine test meal showed achlorhydria

Gastric biopsy revealed superficial gastritis with only minimal atrophy and no intestinal metaplasia (fig 3) It thus differed from the changes seen in the pernicious anæmia subacute combined degeneration group

Biopsy of a superficial cutaneous nerve from the foot showed gross reduction in the number of myelin sheaths (figs and 5) This finding has been described by Greenfield and Carmichael (1935) as occurring both in alcoholic peripheral euritis and in subacute combined degeneration

Blood examination showed Hb 13 3 g per 100 ml., red cells 820 000 per c.mm , and white cells 5200 per c.mm A smear of peripheral blood was normal

Liver function tests showed reversal of the albumin-globulin ratio, flocculation of cephalin — but no bile or urobilinogen in the urine

Liver biopsy showed active hepatitis typical of nutritional disease of the liver (Wood et al 1949b)

Treatment and Progress—When the patient was given a high-calorie high vitamin diet with parenteral vitamin B

Fig 6—Subacute combined degeneration of cord and early pernicious anæmia (case 5) Biopsy specimen of mucosa of body of stomach showing typical atrophy and intestinal metaplasia. (Stain as in fig 1) (×105)

complex, her mental and physical state improved considerably However, after three weeks there was still histamine fast achlorhydria, and a second gastric biopsy showed some lessening in the previously observed cellular infiltration of the lamina propria

This case illustrates the difference between the gastric biopsy findings of a case of alcoholic peripheral neuritis with achlorhydria and cases of pernicious anæmia and subacute combined degeneration

Case 1 has been presented as a patient in whom difficulty of diagnosis of mild symptoms was resolved by gastric biopsy In the case now to be outlined we had the misfortune to watch the development of subacute combined degeneration of the cord in the absence of any hæmatological changes

Case 3 —A male shop assistant, aged 55 was first seen in February, 1948 He had noticed a feeling of numbness under the right costal margin which had appeared about eight years before and lasted two or three years For the past year his right knee had felt stiff, and he had dragged his leg while walking There was a feeling of slight stiffness in the left knee For two years he had had urgency and frequency of micturition without scalding He had been discharged from the Army as class B in 1918 with disorderly action of the heart Seven years previously he had been investigated because of flatulent dyspepsia He stated that radiography of his gall bladder had been normal and that there had been defective acid in the gastric secretion

On examination there were no positive neurological findings or local findings in the knee Investigation gave little further help—the Hb was 14 1 g per 100 ml and the blood film normal, but there was histamine fast achlorhydria, with low peptic activity

The patient was a finicky, introspective man wrapped up in his financial responsibilities to his family and with no outside interests It was felt that his complaint was functional and with reassurance his urinary symptoms almost completely disappeared He still had the feeling of stiffness in his knees but repeated neurological examination showed no abnormal finding

His symptoms were unaltered twelve months later However, because of the persistence of the symptoms slight atrophy of the tongue and histamine fast achlorhydria special investigations were again made The Hb was 15 3 g per 100 ml and the mean corpuscular volume within normal limits The marrow and blood smears were normal The patient had not received any liver therapy

Gastric biopsy showed an atrophic mucosa with intestinal metaplasia consistent with the pernicious anæmia, subacute combined degeneration group (fig 2) When the patient was seen by the neurologist (E G R) in consultation, there was evidence of a spastic paraplegia, with some increase in tendon jerks and extensor plantar responses There was diminution of vibration and position sense in the lower limbs On admission to the ward some three weeks later these signs had

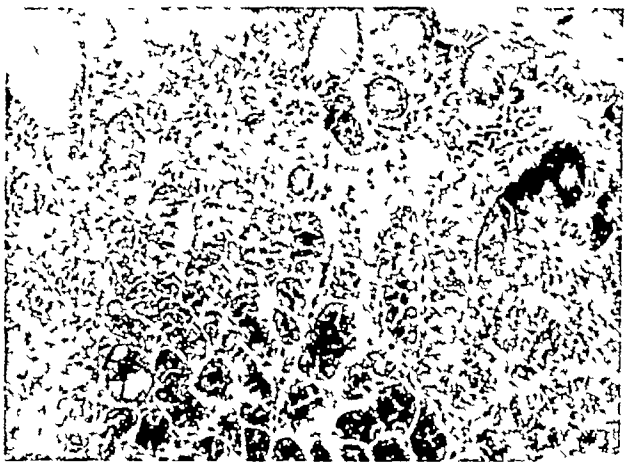

Fig 3—Chronic alcoholism with severe peripheral neuritis and achlorhydria (case 2) Biopsy specimen of mucosa of body of stomach showing mild surface gastritis with atrophy limited to more superficially placed of darkly staining chief cells and lightly staining parietal cells There is some excess of wandering cells in upper portion of section (Stain as in fig 1) (×105)

Gastric biopsy was now done, and the gastric mucosa showed the typical changes of subacute combined degeneration pernicious anæmia syndrome The changes were identical with those illustrated in figs 2 and 6

Cases simulating peripheral neuritis are usually treated uselessly with vitamin B_1 and progress until the diagnosis of subacute combined degeneration becomes obvious Less often liver is given empirically

In general it may be stated that the dysæsthesiæ are obtrusive and annoying The degree of discomfort is reflected in the various descriptive similes which the patients use The dysæsthesiæ affect all limbs, if only the lower limbs are affected, some other cause has to be considered In contrast to the other forms of peripheral neuritis the symptoms tend to outweigh the signs Indeed for a long period few objective signs may be found Impairment of appreciation of vibration is the most easily detected sign, but, if this is considerable, there is usually diminution of appreciation of position and passive movement If the loss is pronounced in the lower limbs, the patient usually does not appreciate vibration over the lumbar spines, and even higher Loss of superficial sensibility may be difficult to detect, since the patient can detect changes much more effectively than the coarse tests applied clinically Even when dysæsthesiæ have been present for months, motor signs are slight unless the spinal cord is involved Muscular tenderness is neither so pronounced nor so constantly present as in peripheral neuritis

EARLY CHANGES IN PERIPHERAL BLOOD AND BONE MARROW

The peripheral blood and the bone marrow may vary from normal to those of frank pernicious anæmia This agrees with the contention of Dacie and White (1949) that there are all grades of deficiency of the essential hæmopoietic substance paralleled by corresponding changes in the blood and bone marrow

It is essential in cases with only minor peripheral blood changes (minor deficiency of hæmopoietic substance) to make a comprehensive hæmatological examination (Wintrobe 1946), including a critical examination of the erythropoietic marrow The smear of the peripheral blood usually to some degree suggests pernicious anæmia, and an increased mean red cell volume and red cell diameter confirm the macrocytic nature of the anæmia Where macrocytosis is present in the peripheral blood, the diagnosis of pernicious anæmia is confirmed by finding in the marrow smear some evidence of a megaloblastic type of erythropoiesis, together with the presence of giant metamyelocytes and hypersegmented neutrophils

The extent of the megaloblastic change in the marrow is proportional to the quantitative lack of essential factor, thus the appearance may vary from the crowded primitive large megaloblasts containing coarse stippled chromatin with nucleoli, as seen in a gross deficiency, to the form typical of minor grades, where there is a less cellular marrow with only a few smaller and rather mature megaloblasts Here the major feature of the deviation from normal is an increase of the pale parachromatin at the expense of the basichromatin, giving a nucleus with open lace net pattern Dacie and White (1949) have termed these forms "intermediate megaloblasts" This is well illustrated in case 5 We have also seen "intermediate megaloblasts" in the marrow smear where a minor degree of deficiency of essential factor has been produced by suboptimal treatment of a case of frank pernicious anæmia

ACHLORHYDRIA AND GASTRIC BIOPSY

In the present investigation gastric biopsy was performed with the flexible gastric biopsy tube designed in this unit (Wood et al 1949a) By this method fragments of mucosa 1 mm in diameter and extending down to the muscularis mucosæ (fig 1) can be obtained with minimum discomfort to the patient Even in seriously ill patients gastric biopsy can be carried out with little upset

We consider that histamine fast achlorhydria is a constant finding in subacute combined degeneration of the cord, and gastric biopsy in our cases has shown corresponding atrophic changes in the mucosa of the body of the stomach The appearance of the gastric mucosa is reasonably constant There is always thinning, with atrophy of the pepsin secreting chief cells and the acid secreting parietal cells This atrophy may be complete or a few scattered remnants may survive Metaplasia of the epithelium to an intestinal type with plentiful mucus goblet cells is often extensive The stroma may show some wandering cells of mononuclear type, but polymorphs are always absent or scanty (fig 2)

The histological appearance of the gastric mucosa in this pernicious anæmia, subacute combined degeneration group is not entirely specific, but in biopsies from 278 patients chiefly suffering from dyspepsia we have seen only 2 cases with extreme atrophy, thinning, and intestinal metaplasia who have not already had, or subsequently developed, the signs of pernicious anæmia and/or subacute combined degeneration of the cord There were 26 cases of established pernicious anæmia in this group All the other cases having histamine fast achlorhydria

Fig 4—Biopsy specimen of internal branch of anterior tibial nerve from healthy person showing normal number of darkly staining myelin sheaths (Osmic acid) (×490)

ere present over pressure points Retention of urine with erflow had led to severe cystitis There was irregular largement of the uterus, and on admission carcinoma of e uterus with spinal metastases had been tentatively agnosed Lumbar puncture revealed a normal c s.f Radioaphy of the lumbar spine was normal Subacute combined generation was suspected, and confirmatory evidence was ught.

Blood examination showed Hb 8 8 g per 100 ml , red cells ,620,000 per c mm , and packed erythrocyte volume of 31% he film showed a moderate degree of anisocytosis and oikilocytosis, but macrocytes were not obvious There was neutrophil leucocytosis Calculation of the mean red cell alues gave a volume of 117 c.μ and a Hb content of 33 μμg

Bone marrow—The significance of the very considerable ncrease in mean red-cell volume was confirmed by the sternal narrow smear, which showed a cellular marrow with a elative increase in erythroid elements, a small proportion 2%) of which were "intermediate megaloblasts" (fig. 7) Giant metamyelocytes numbered about 3% of the nucleated cells present There was a histamine fast achlorhydria

Gastric biopsy showed a greatly thinned mucosa with complete atrophy of chief and parietal cells (fig 6) There was complete metaplasia of the epithelium to intestinal type

Treatment—Injections of liver extract were started, but response was unsatisfactory The urinary sepsis proved difficult to control, and the patient died six weeks after admission.

Necropsy Findings—There were gross atrophy of the mucosa of the body of the stomach and typical degeneration of the posterior and lateral columns of the cord, with absence of gliosis (fig 8)

This case illustrates the necessity for volumetric red-cell determinations, since without this the macrocytosis was not obvious The recognition of "intermediate megaloblasts" and giant metamyelocytes in the marrow smear, and the finding of an atrophic gastric mucosa by biopsy, clinched the diagnosis of subacute combined degeneration An incomplete hæmatological examination made several days before the patient's admission to hospital had not provided the correct diagnosis.

DISCUSSION AND SUMMARY

In pernicious anæmia the bone marrow, blood, and gastric mucosa show characteristic changes These are respectively megaloblastic hyperplasia, macrocytosis, and atrophy In subacute combined degeneration of the cord the changes in the hæmopoietic system are sometimes not obvious In these cases the diagnosis may be confirmed by the finding of intermediate megaloblasts in the bone marrow and increase in the mean erythrocyte volume and diameter Biggs and Macmillan (1948) have shown the colour index to be a misleading guide in diagnosis They predict a return to Price Jones curves

Sometimes, however, the results of all these examinations are normal If there is free hydrochloric acid in a test-meal, the diagnosis of subacute combined degeneration is we believe, untenable If there is histamine fast achlorhydria, the correct diagnosis may be, and probably is, subacute combined degeneration However, a few conditions—e g , alcoholic peripheral neuritis—may be associated with histamine fast achlorhydria Thus, this test lacks certainty Gastric biopsy will serve to separate such cases of peripheral neuritis The biopsy is of greater value in diagnosis than is a test meal alone It will allow of an almost certain diagnosis at a stage in which the patient complains only of dysæsthesiæ with normal hæmatological findings Gastric biopsy may indicate the diagnosis of subacute combined degeneration in cases with advanced neurological signs where the diagnosis is uncertain on clinical grounds

Lastly, at any stage it may help in solving the recurrent problem of diagnosis after injudicious liver therapy

In practice, however, early diagnosis depends on the appreciation of the importance of mild neurological symptoms If paræsthesiæ, with or without neurological signs, suggest the diagnosis, it is essential to give a test meal and to examine the blood for macrocytosis and the bone marrow for megaloblasts If doubt still exists, gastric biopsy provides a criterion for recognition or exclusion of subacute combined degeneration of the cord

We wish to thank members of the honorary medical staff of the Royal Melbourne Hospital who have referred cases to us The photomicrographs were prepared by Mr E Matthaei, of the University of Melbourne

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FŒTAL MORTALITY IN PREGNANT RATS TREATED WITH ANTERIOR-PITUITARY EXTRACTS AND IN ALLOXAN-DIABETIC RATS

H H. FOURACRE BARNS*
M B Lond , F.R C S , M R C O G
ASSISTANT, OBSTETRIC UNIT, UNIVERSITY COLLEGE HOSPITAL
GYNÆCOLOGICAL SURGEON, HOSPITAL FOR WOMEN, SOHO SQUARE, LONDON

O LINDAN†
Med Dipl Poznan

M E MORGANS*
M.B Lond , M.R C P

ASSISTANTS, MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL

E REID‡
Ph.D Lond
CARNEGIE RESEARCH FELLOW, DEPARTMENT OF BIOCHEMISTRY, UNIVERSITY COLLEGE, LONDON

G I M SWYER
M A , D M , D Phil Oxfd, M R C.P
ENDOCRINOLOGIST, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

THE association of diabetes and pregnancy was a medical curiosity before the introduction of insulin , since then, however, pregnancy in the diabetic has become increasingly frequent, and it has long been recognised that it leads to a very high fœtal mortality which is apparently little affected by careful control of the maternal diabetes Fœtal gigantism is a further feature of this association A striking result of recent investigations has been the demonstration that these fœtal effects are found before the onset of diabetes in the pregnancies of women who subsequently develop diabetes (prediabetic pregnancies) (Miller et al 1944, Miller 1945, Henley 1947, Barns and Morgans 1948, Gilbert and Dunlop 1949, Gilbert 1949) That the prediabetic phase may be a long one is shown by the finding of Barns and Morgans (1948) that the total late fœtal mortality-rate, consisting of intra uterine deaths, stillbirths, and neonatal deaths but excluding abortions, begins to exceed that for normal pregnancies about fifteen years before the onset of diabetes

It seems reasonable to suppose that the most important factors responsible for the effects on the fœtus in prediabetic and diabetic pregnancies are similar if not identical, and it was suggested by Barns and Morgans (1948) that the large infant of the prediabetic and diabetic mother and the subsequent development of diabetes in the prediabetic woman might be due to an overproduction of the "diabetogenic-growth complex"

* Lund Research Fellow of the Diabetic Association
† In receipt of a grant from the Medical Research Council
‡ Now Beit Memorial Fellow at School of Biochemistry, University of Cambridge

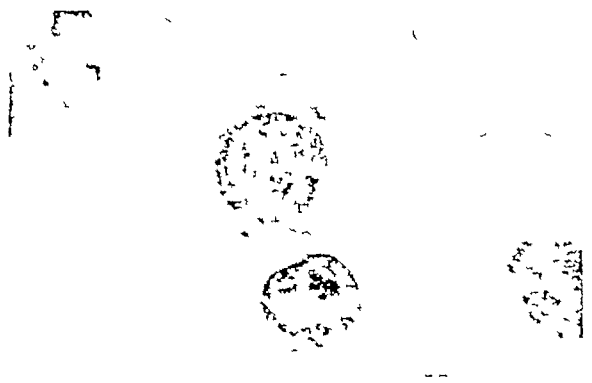

Fig 7—Marrow from case 5 (same patient as fig 6) Basophil 'intermediate megaloblast' with open lace-net pattern of the nuclear chromatin which is in smaller aggregates. The cell is larger than the corresponding basophil normoblast. (×1200)

become even more obvious Because the signs and symptoms were confined to the lower part of the body, it was considered wise to exclude spinal compression Queckenstedt's test, examination of the cerebrospinal fluid (C S F), and opaque myelography were normal

Treatment—The patient was started on a course of 'Campolon' A maintenance course of 10 ml every two weeks did not check mild deterioration in subjective findings The liver treatment was continued for five months, but interrupted when the patient attended an osteopath At the end of a further three months it was found that his plantar responses were much less definitely abnormal than before He complained, however, of deterioration of his condition and stated that he had some dysæsthesiæ in the hands Admission to the ward was arranged for treatment with vitamin B_{12} When examined shortly after the first injection his plantar responses were flexor Gastric biopsy was repeated at the second admission and showed the initial picture Histamine test-meals have persistently shown achlorhydria with low peptic activity

In this patient objective neurological signs did not manifest themselves even two years after the onset of symptoms Shortly after a typical gastric biopsy picture had been obtained, signs of paraplegia were obvious Had biopsy been done earlier we feel that, despite atypical symptoms with no signs and no anæmia, a correct diagnosis would have been made and earlier treatment instituted

A second and similar problem is presented when there has been a haphazard use of liver extract for the treatment of incompletely investigated anæmias This malpractice is undoubtedly world wide It may lead to suboptimal treatment of a suspected case of pernicious anæmia which has not been positively identified either before or after liver treatment was begun In such a case nervous changes suggesting subacute combined degeneration of the cord may develop in spite of a nearly normal blood picture The physician is then confronted with the problem of both diagnosis and treatment Should he assume the diagnosis of pernicious anæmia, subacute combined degeneration syndrome and commit the patient to a lifelong course of liver injections? Or should he cease treatment for a time to watch for the appearance of undoubted pernicious anæmia or subacute combined degeneration? This latter course would be fraught with much danger if the diagnosis is subacute combined degeneration, for the march of nervous symptoms may be rapid and, although liver injections may halt this progress and cause some improvement, irreparable damage may have been done Here gastric biopsy is of great value, for, should the gastric mucosa show the stigmata of severe gastric atrophy, this would support the diagnosis of subacute combined degeneration of the cord This is illustrated by the following case

Case 4—A woman, aged 57, had five years' history of gradually increasing weakness in the legs For the last two years she had been unable to walk, and there was loss of sphincteric control A year ago her physician had first suspected pernicious anæmia and subacute combined degeneration and prescribed liver tablets A satisfactory blood examination had not been made The patient had continued to take the liver tablets in suboptimal amounts but she had ceased to obtain medical attention On her admission to hospital a spinal tumour was provisionally diagnosed.

Examination showed general wasting and weakness, diminished deep reflexes, extensor plantar responses, and gross impairment of posterior-column conduction There was loss of sphincteric control, with severe infection of the bladder and a large sacral bedsore Lumbar puncture was normal The Wassermann reaction in blood and C.S F was negative A histamine test-meal showed achlorhydria Blood examination showed Hb 8 4 g per 100 ml., red cells 3,040,000 per c mm, leucocytes 20,000 per c mm, and anisocytosis and occasional poikilocytes in a blood film Volumetric estimations were not made A bone marrow smear showed increased normoblastic erythropoiesis Serum bilirubin 4 units. The patient now came under our observation

Gastric biopsy revealed gross atrophy of the mucosa of the body of the stomach, typical of pernicious anæmia.

Treatment—With liver injections and control of urinary infection there was improvement in the anæmia, the Hb rising from 8 4 to 13 3 g per 100 ml in six weeks There was only slight improvement in the nervous signs

This elderly woman developed paralysis in the legs and loss of sphincteric control Pernicious anæmia and subacute combined degeneration were suspected by her medical attendant, but an adequate blood examination was not made at that time Oral liver therapy was ordered but was continued in suboptimal dosage without medical control After admission to hospital pernicious anæmia was suspected, but a confident diagnosis was not made The blood and marrow appearances had been rendered inconclusive by the prior administration of oral liver Gastric biopsy provided strong supporting evidence of subacute combined degeneration

The difficulties experienced in reaching a clinical diagnosis of subacute combined degeneration and the value of the various tests are well illustrated in the following case

Case 5—A woman, aged 64, had developed retention of urine and increasing weakness of both legs two weeks before admission to hospital She could walk only a few steps Previous to this her health had been good

On examination she was found to have a smooth atrophic tongue and wasting of her leg muscles, with gross weakness of all movements Knee and ankle jerks were absent, plantar responses were extensor, and sensation to light touch and pinprick was absent over both legs and thighs Perception of vibration was absent at the right knee and ankle Bedsores

Fig 6—Lumbar portion of spinal cord showing extensive degeneration of posterior and lateral columns with absence of glial reaction (case 5) (Weigert.)

was 153, there were 27 stillbirths (18%), and of the live born rats 24 (19%) died within forty eight hours (table I) Only 50% of the live born rats were weaned Fœtal resorption occurred in 3 instances, as indicated by uterine bleeding after an initial rise in body weight, followed by a fall in weight to the preconception levels More detailed descriptions of the course of diabetes and pregnancy in the alloxan diabetic rat will be published elsewhere.

Controls and Crude A P.E

There were 30 pregnancies in the control group, producing 218 young, of which 6 (2 75%) were stillborn, of the live born rats 4 died within the first forty eight hours, the neonatal mortality thus being 1 9% (Since no differences were observed between the controls injected with saline solution and those injected with liver extract, they have been grouped together)

The dosages of A P E used and the incidence of stillbirths and neonatal deaths are shown in table I It can be seen that, when the dose reached 0 25 ml a day, the stillbirth rate was practically 100% Many of the still born fœtuses were macerated or partly eaten, and in some cases the maternal loss of weight on delivery was so discrepant from the number of fœtuses found that one had to conclude that some had been eaten completely, because of this the sign > has been used in table I where uncertainty existed, and in calculating the stillbirth rates it has been assumed that only stillborn fœtuses were eaten

TABLE II—COMPARISON OF GONADOTROPHIC ACTIVITY OF C G AND FRACTIONATED A.P.E IN 22 DAY OLD FEMALE RATS

Groups	No of animals per group	Group means and standard deviations	
		Weight of ovaries (mg)	Weight of uterus (mg)
Controls	10	12 1 ± 2 9	29 0 ± 8 1
C G 10 I U a day	9	24 4 ± 3 7	97 7 ± 18 3
C G 40 I U a day	10	29 4 ± 7 3	116 6 ± 16 4
Fractionated A.P E 0 25 ml. a day	10	10 9 ± 1 6	27 5 ± 5 1
Fractionated A.P.E 2·0 ml. a day	10	12 2 ± 1 8	25 6 ± 4 7

Chorionic Gonadotrophin

It is possible that crude A P E (ox) may contain the luteinising factor in considerable quantity (cf Young 1939), and, since the effects of the extract might have been due to this hormone rather than to the diabetogenic growth complex or other factors, it was thought justifiable to test the effects of chorionic gonadotrophin (C.G), which was the most readily available source of gonadotrophin with an almost purely luteinising action

The effects of various doses of C G are shown in table I, from which it can be seen that the stillbirth rate was at least 8% with a dose of 12 5 I U a day, but that with higher doses all the fœtuses died in utero and the mothers remained undelivered, either the fœtuses being completely resorbed or the mothers dying Non delivery of the mother after intra uterine death of the fœtus was also found in some of the rats on the higher doses of crude A.P.E.

Fractionated A.P E

It will be seen that the effect of C G on fœtal mortality resembles that of crude A.P E Possibly, therefore, the lethal action of the crude A P E could have been due to its assumed content of luteinising factor, and it was therefore of considerable interest to see whether an A P.E fraction believed to be free from gonadotrophin but known to still contain the diabetogenic growth complex would have similar effects on the fœtus Tests for gonadotrophic activity were made on two batches of fractionated A P.E by three different methods In the first of these the test animals were 22-day old female rats weighing 26–42 g These were divided into five groups, of which one (controls) received injections of saline solution 0 5 ml, two received C G 10 I U and 40 I U, and two received the fractionated A P.E 0 25 ml and 2 ml, the volume of which had been adjusted so that the diabetogenic potency was about equal to that of the crude A P E Subcutaneous injections were given daily for three days, and the rats were killed with ether on the fifth day The ovaries and uteri were dissected out and weighed The results are shown in table II, from which it can be seen that the test animal was a sensitive preparation for C C and that the fractionated A P E had no detectable gonadotrophic activity

TABLE III—COMPARISON OF GONADOTROPHIC ACTIVITY OF FRACTIONATED AND CRUDE A.P E IN 21 DAY OLD FEMALE MICE

Groups	No of animals per group	Group means and standard deviations	
		Weight of ovaries (mg)	Weight of uterus (mg)
Controls	5	3 4 ± 1 5	7 8 ± 2 2
Crude A P E 0 05 ml a day	5	2 6 ± 0 9	10 8 ± 3 3
Crude A P E 0 1 ml a day	4	2 25 ± 1 3	9 75 ± 2 2
Fractionated A.P E 0 1 ml a day	5	2 8 ± 0 45	8 8 ± 1 6
Fractionated A P E 0 2 ml. a day	4	2 75 ± 0 5	9 75 ± 0 9

In the second test a comparison was made between the gonadotrophic activity of the crude and fractionated A P E in 21 day-old female mice weighing 10–17 g These were divided into five groups, of which one (controls) received injections of saline solution 0 2 ml two received crude A P E 0 05 ml and 0 1 ml, and two received fractionated A P E 0 1 ml and 0 2 ml The mice were treated in the same way as the rats, and the results are shown in table III, from which it can be seen that the doses of A P.E used had no detectable gonadotrophic activity

Because there are theoretical objections to these methods of detecting luteinising hormone, it was thought advisable to make a further test, using the rat prostate and seminal vesicle as the indicator preparation Loraine (1949) has shown that the weight of the rat prostate is a convenient index for the assay of chorionic gonadotrophin Of five groups of 21 day old male rats weighing 32–50 g one (controls) received injections of saline solution 0 4 ml, two received C G 0 66 I U and 1 33 I U, one received crude A P.E 0 25 ml, and one received fractionated A P.E 0 5 ml Injections were given as described above, and the rats were killed on the fifth day, when the prostates and seminal vesicles were removed and fixed in formol saline Subsequently they were dissected free from surrounding tissues and weighed The results are shown in table IV, from which it must be concluded that

TABLE IV—COMPARISON OF GONADOTROPHIC ACTIVITY OF C G, FRACTIONATED A.P.E, AND CRUDE A.P.E IN 21 DAY OLD MALE RATS

Groups	No of animals per group	Group means and standard deviations	
		Weight of prostate (mg)	Weight of seminal vesicles (mg)
Controls	6	49 7 ± 8 5	7 5 ± 2 0
C G 0 66 I U a day	5	80 0 ± 8 5	11 9 ± 1 4
C G 1 33 I U a day	5	84 4 ± 27 9	18 8 ± 4 4
Crude A.P E 0 25 ml a day	5	50·0 ± 12 3	6 0 ± 1 2
Fractionated A.P.E 0 5 ml a day	5	57 6 ± 18 6	9 4 ± 3 5

by the maternal anterior pituitary gland, the overactivity of which might in addition be responsible for the high late fœtal mortality rate in the pregnancies in question A similar suggestion about the fœtal gigantism has been made by Gilbert (1949)

The present investigation is an attempt to see whether experimental support for this hypothesis can be provided by studying the effects on the fœtal mortality rate in pregnant rats of treatment with anterior pituitary extracts (A P.E) containing the diabetogenic growth complex The rat, while receiving these injections, might reasonably be considered as in the "prediabetic state," although it is impossible to induce diabetes, or even hyperglycæmia, in the rat by repeated injections of this extract (Young 1938), the reaction of the rat resembles that of puppies injected with the extract in so far as increase of growth rate is the principal effect observed (Young 1941) Because there have been conflicting reports of the effect on fœtal mortality of alloxan diabetes —e g, Davis et al (1947) and Miller (1947)—it was thought wise to reinvestigate this point, so as to compare the effect of hyperglycæmia, primarily of pancreatic origin, with that of A P E

EXPERIMENTAL

Virgin adult female rats were used for the experiments recorded here Alloxan diabetes was induced in two strains of albino Wistar rats weighing 170–230 g by a subcutaneous injection of 20 mg of alloxan per 100 g of body weight on each of two successive days (Dunn and McLetchie 1943), one group was starved for forty eight hours before the first injection and fourteen hours between injections to increase susceptibility to alloxan (Kass and Waisbren 1945) When the diabetes had become established, the rats were put with bucks and were segregated just before delivery Repeated pregnancies took place in some of these rats The diabetes was not controlled with insulin

The rats used for A P E injections were virgin females, weighing 120–200 g, of mixed strains Only one pregnancy per rat was permitted in this series They were put with bucks, and daily vaginal smears were examined At first the finding of a vaginal plug was taken as an indication of mating, but it was found to be unreliable as evidence of conception Its use was therefore abandoned, and instead the so called "placental sign" (vaginal bleeding at about the fourteenth day of pregnancy) was adopted as the indication of conception Even this was sometimes unreliable Subcutaneous injections were started on the day of finding the placental sign and were given daily until delivery or death of the rat In each series of experiments control animals were injected daily with 0 25 ml of physiological saline solution or of an alkaline saline extract of acetone dried liver prepared in the same way as A P.E and used to exclude the possibility of non specific protein effects

The "crude A P E" used initially consisted of a Seitz filtered extract containing 0 01% 'Merthiolate' (Eli Lilly & Co) It was prepared from fresh ox anterior pituitary glands, by extraction with alkaline saline, essentially according to the procedure described by Young (1939, 1941) The extract contained all the hormones present in ox anterior pituitary tissue, which is, however, a poor source of follicle stimulating hormone and of adrenocorticotrophic hormone Of this extract 1 ml (equivalent to 0 25 g of anterior lobe tissue) contained 15–20 mg of protein, of which 3–5 mg was growth hormone—an amount sufficient to produce striking growth in the non pregnant adult female rat when injected over the course of a fortnight Although purified growth hormone is diabetogenic (in the cat) per se (Cotes et al 1949a), the possibility cannot be excluded that the "diabetogenic growth complex" involves not only growth hormone (cf Cotes et al 1949b) but also traces of other factors, such as adrenocorticotrophic hormone

The "fractionated A P E" used in certain experiments was a "saline supernatant" fraction prepared by isoelectric precipitation from crude A P E (Reid and Young 1948, Reid 1949) About two thirds of the protein in such a fraction consists of growth hormone, and it is again possible that traces of, say, adrenocorticotrophic hormone present in the fraction are a constituent of the "diabetogenic growth complex" The method of preparation was such that the fraction was unlikely to contain gonadotrophins in appreciable amounts

The chorionic gonadotrophin was a standardised preparation from human pregnancy urine containing 100 I U per mg Its solution in distilled water was freshly prepared before each injection

All the rats were weighed daily either throughout pregnancy or from the time of appearance of the placental sign They were kept at 72°F and were fed a vitamin enriched cube diet ad lib At the end of the pregnancy the numbers of live births and stillbirths were noted, the live young being returned to their mothers and observed during the succeeding days for neonatal and infant deaths Summary data of the rats are shown in table I

RESULTS

Alloxan Diabetes

Of 47 animals injected with alloxan 23 died in the first few days, 4 were not affected, and 20 developed permanent severe hyperglycæmia (blood sugar levels 220–700 mg per 100 ml), glycosuria, polydipsia, and polyuria Ketosis was not detected during twelve months' observation, but nevertheless all the animals developed cataracts two or three months after injection A total of 27 pregnancies occurred in 14 of these diabetic rats over an average mating period of about 300 days The total number of young born from 24 pregnancies

TABLE I—SUMMARY DATA OF RATS USED AND OF RESULTING STILLBIRTH AND NEONATAL MORTALITY

Groups	Controls	Alloxan diabetes	Crude A P E * (ml a day)							C G * (I U a day)				Fractionated A P E * (0 5 ml a day) †
			0 016	0 031	0 062	0 125	0 25	0 5	1 0	12 5	25	50	100	
No of rats allocated to each group	37	20	1	3	13	14	15	3	3	6	4	7	11	9
No of rats which became pregnant	30	14‡	1	3	5	12	11	3	3	6	4	6	5	8
No of fœtuses delivered	218	153	0	31	>24	>43	>41	16	11	>12	The fœtuses died in utero in all cases and mother remained undelivered			>35
No of stillbirths	6	27	0	2	>10	>22	>30§	10§	11§	>1§				>20
Stillbirth rate %	2 75	18		7	>42	>50	Nearly 100	100	100	>8				>83
No of neonatal deaths	4	24	0	0	1	1	1							0
Neonatal mortality %	1 9	19												
No of infant deaths		39												
Infant mortality %		31												

* These injections were started *after* pregnancy had been diagnosed †Equivalent in diabetogenic potency to about 0 4 ml of crude A.P E ‡ 27 pregnancies. § This does not include intra uterine deaths when the mother remained undelivered

ENAL-TRACT DELAY TIME AND DEAD SPACE

R R McSWINEY H E DE WARDENER
M B Lond M D Lond, M R C.P

ECTURERS IN THE DEPARTMENTS OF CHEMICAL PATHOLOGY AND MEDICINE ST THOMAS'S HOSPITAL MEDICAL SCHOOL, LONDON

DURING investigations into renal function it became ecessary for us to know the time elapsing between the ormation of urine in the kidney and its appearance rom the end of a urethral catheter After urine has een formed it must traverse the renal collecting tubules, alyces, and pelvis, the ureter, the bladder, and the urethral catheter, the volume of all these structures ogether is here referred to as the "renal tract dead pace" and the time needed for the urine to traverse hem may be called "renal tract delay time"

Smith et al (1938) estimated that the renal tract elay time averages 150 sec at urine flows of 2–6 ml a minute, but Goldring and Chasis (1944) say "there is a large dead space in the collecting tubules, pelves, and ureters, and the appearance time of the dye will vary inversely with the rate of urine flow" There seems to be a discrepancy between these two statements We have not found any other published observations on delay time and dead space, although there are several speculative statements in the published work—for instance, Brun et al (1945) remark that "the size of the dead space is difficult to judge but it may be estimated at about 5–10 ml" Finally, though Schwartz et al (1949) recognised that renal dead space might involve errors in the determination of extracellular fluid volume by their method and noted that their "data are not corrected for renal dead space," they gave no method for estimating it

Our observations depend on the principle that if the dead space is x ml and the urine flows at v ml a minute, the delay time is x/v Since urine flow is easily measured, if either the delay time or the dead space is known the other can be calculated

TECHNIQUE

Twenty four observations were made on 17 persons with regular urine flows of 0 6–14 0 ml a minute A multi-eyed urethral catheter (internal volume 2 ml) was passed, and the spontaneous flow of urine from the end of the catheter was measured for several minutes Then 0·6 g of sodi *p* aminohippurate (P A H) in 20 ml of isotonic saline rapidly injected into an antecubital vein, and a stop wa was started At the same instant urine collections w begun, and when sufficient urine had been collected the ur flow was again measured

The volume of each urine collection was next measu to ± 0 1 ml and reagents of Bratton and Marshall (19 were added to each separate collection, these reagents g an intense reddish purple colour with very small quantit of P.A H, so that the presence of this injected substa could readily be detected in the urine

It was regularly found that P A H was absent fr several collections after the intravenous injection, trace would then appear, and in subsequent collectio the concentrations would increase and soon reach maximum This absence of a clear cut end point show as expected, that considerable mixing took place in the dead space and made an accurate estimation of it volume impossible Nevertheless, the dead space could not be smaller than the volume of the collections made up to the detection of the trace of P A H (minimal dead space) nor larger than the volume of the collections made when the maximal concentration first appeared (maximal dead space) In the earlier experiments these collections were made, irrespective of time, in volumes of about 1 ml, and, within rather wide limits, the dead space could be measured, from a measure of the urine flow the delay time was then calculated In later experiments urine collections were made in timed perio of 10 sec, irrespective of volume, and the delay time a dead space could both be directly measured with t same limitations

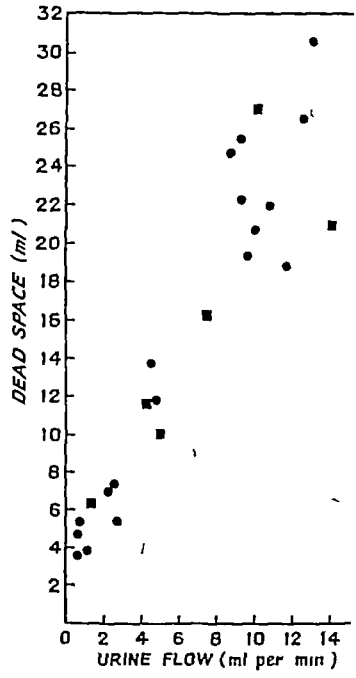

Fig 1—Relation of dead space to uri flow: circles denote P.A H average de space of each experiment shown in t accompanying table squares denc methylene-blue dead space

To 3 persons, when P A H delay time and dead spa had been estimated at comparatively low rates of uri flow, water was given in large amounts About an ho later, when a high stable urine flow was reached, t dead space and delay time were determined again aft a fresh injection of P A.H The P A H originally injecte had nearly disappeared from the urine, and the end poi of this second experiment could be detected with t same ease (and limitations) as before

In 6 persons the delay time was measured after a intravenous injection of methylene blue (100 mg in 1 ml by timing its first appearance in the urine, 2 of the had had a previous determination made with P A H a hour or so before at a different rate of urine flow

Clearly this method of estimating delay time an dead space can only be applied if the urine flow almost continuous and regular The flow of urine fro a catheter is often intermittent, with spontaneous cyclic interruptions We have rejected seven observations people in whom the interruption has lasted longer tha 20 sec

TOTAL RENAL-TRACT DEAD SPACE AND DELAY TIME MEASURED AFTER INJECTION OF P.A.H. AND METHYLENE BLUE INTO ANTECUBITAL VEIN

Case no	Urine flow ml /min	Dead space (ml)			Delay time (min)		
		Min	Max	Av	Min	Max	Av
1	9 3	18 7	25 4	22 1	2 0	2 7	2 4
2	5 0*	10 0			2 0		
3	1 2	2 5	4 8	3 7	2 1	4 0	3 1
	8 9	22 8	26 8	24 8	2·6	3 0	2 8
4	2 4	5 5	8 5	7 0	2 3	3 5	2 9
	1 4*	6 25			4 5		
5	2 9	4 3	6 4	5 4	1 5	2 2	1 9
	14 0*	21 0			1 5		
6	10·6	19 1	24 4	21 8	1 8	2 3	2 1
	7 4*	16 3			2 2		
7	9 2	22 2	28·6	25 4	2 4	3 1	2 8
8	10·0	18 5	23 0	20 8	1 9	2 3	2 1
9	0 9	3 5	7 1	5 3	3 9	7 9	5 9
	11 8	16 1	21 2	18 7	1 4	1 8	1 6
10	0 9	2 8	4 2	3 5	3 1	4 7	3 9
	12 5	24 2	28 7	26 5	1 9	2 3	2 1
11	0 6	4 0	5 4	4 7	6 7	9 0	7 9
12	4 7	8 5	14 9	11 7	1 8	3 2	2 5
13	4 5	10 5	17 1	13 8	2 3	3 8	3 1
14	9 6	18 3	20 3	19 3	1 9	2 1	2 0
15	2 6	6 5	8 3	7·4	2 5	3 2	2 9
	10 0*	27 0			2 7		
16	13 2	26 9	34·4	30 7	2 0	2 6	2 3
17	4 3*	11·6			2 7		

* Methylene blue determination

no gonadotrophic activity could be detected in either A.P.E preparation

Injections of a batch of fractionated A P.E 0 5 ml daily, equivalent in diabetogenic potency to about 0 4 ml of crude A.P E, were given to pregnant rats (table I) Altogether 35 fœtuses were counted, of which 29 (83%) were stillborn (There were probably some completely eaten fœtuses in addition) With two subsequent batches of fractionated A P E, injected in amounts equivalent in diabetogenic potency to 0 25 ml of crude A.P E daily, somewhat different results were obtained. Several rats delivered litters which were either alive or at most contained one or two stillbirths The remainder showed vaginal bleeding due to placental separation, with intra uterine death of fœtuses, and died undelivered The fœtal mortality in these two groups was 29 out of 37 (88%), and 34 out of 66 (52%)

DISCUSSION

From the foregoing results it seems possible to draw certain clear conclusions First, pregnant alloxan-diabetic rats produce an increased number of stillbirths (18% compared with 4% for controls), but pregnant rats treated with relatively high doses of crude A P E produce 100% of stillbirths The results of injections of C G suggested that at least some of this mortality could be due to the assumed content of luteinising factor in the crude A P.E preparation An attempt was made to ascertain whether the crude A P.E did, in fact, have gonadotrophic activity Administration of crude A P E to immature female mice or male rats did not significantly influence the weights of the ovaries and uterus or of the prostate and seminal vesicles respectively, although C G was highly effective in the male rats and is well known to be similarly effective in immature female mice On the other hand, extracts from ox pituitaries, in contrast to those from sheep or hog pituitaries or to non-pituitary gonadotrophins, may be highly effective in inducing ovulation in the rabbit, but almost ineffective in influencing the weight of the ovaries or of the seminal vesicles of immature rats (Wallen Lawrence and Van Dyke 1931, Chance et al 1939, Noble et al 1939) A further complication in the case of the rat is the occurrence of strain differences, as demonstrated by Fraenkel Conrat et al (1940) a strain which was sensitive to urinary or serum gonadotrophins was insensitive to a sheep pituitary preparation, and the converse was found with another strain

Fractionated A.P E preparations, which were anticipated to be essentially free from gonadotrophins, did not show gonadotrophic activity in the tests, but this result should be interpreted with caution in view of the failure to show activity with crude A P.E However, since the fractions consist predominantly of growth hormone, and produced a lethal effect on the fœtus in some instances, it seems likely that growth hormone, or at least the "diabetogenic growth complex," is the important factor in producing this effect The variability in the effects on fœtal mortality of different batches of fractionated A.P E, although difficult to explain, is in conformity with the results obtained by Watts (1935)

The high mortality of live born young of alloxan diabetic rats deserves comment It could be due to the abnormal intra uterine environment, to defective lactation, or to both, and, since the distribution of deaths in the alloxan diabetic and A P.E -injected rats is so different, one is inclined to regard defective lactation as an important element contributing to the deaths of 50% of the live born young of alloxan diabetic rats

It is felt that the evidence presented here is consistent with the suggestion of Barns and Morgans (1948) about the lethal factor in prediabetic and diabetic pregnancies, it makes no contribution towards a solution of the problem of the overweight baby characteristic of these pregnancies, for which purpose the arrangement of the experiment was unsuitable

SUMMARY

A comparison has been made of the fœtal mortality of rats made diabetic with alloxan and that of pregnant rats given injections of ox anterior pituitary extracts (A P E) containing the "diabetogenic-growth complex." For the former the stillbirth rate and neonatal death rate were 18% and 19% respectively, though of the live-born young only 50% were weaned With suitable doses of crude A P E, however, 100% of stillbirths were obtained.

Because the crude A P.E might have contained appreciable amounts of the luteinising factor, the effects of chorionic gonadotrophin were investigated It was found that suitable doses caused intra uterine death with failure of delivery of the uterine contents, followed either by resorption or maternal death

A fractionated A P.E, still containing the "diabetogenic growth complex" but believed to be gonadotrophin free, was given to pregnant rats Different batches produced variable results, the fœtal mortality being 52–88%

It is felt that these results are consistent with the hypothesis that overproduction of the "diabetogenic growth complex" by the maternal anterior pituitary may be responsible for the high late fœtal mortality rate in prediabetic and diabetic women as well as for the subsequent development of diabetes in the former

The cost of the pituitary glands used in this investigation was defrayed by a grant from the Medical Research Council to Prof F G Young We are indebted to him for making the crude A P E available, for this and for his interest and advice, as well as for that given by Prof. H P Himsworth, we wish to express our sincere thanks

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"The man in the street, or more correctly, the woman in the home has to cope with a more varied selection of social visitors than is necessary the harassed housewife might well be forgiven if she suggested that many of their functions might well be entrusted to one 'general purposes' visitor to whom she could tell all her social problems, and who would be interested in all her children, and in all her difficulties The remedy would appear to be that the social work of the hospital should be carried out by the health visitors of the local authority This suggestion is not administratively 'tidy,' and would call for much day to-day improvisation. But it is better to have continuous crises in the administrative machine than to have them amongst the public which it serves"—Dr HUGH PAUL, M O.H. for Smethwick, in his report for 1949

he skin, containing serosanguineous or seropurulent fluid About thirty crusts marked the sites of less recent bullæ Some were yellow at first and to all appearances like those of ecthyma Others were dense, dry, adherent, and black, these did not fluoresce in Wood's light, and their colour was attributed to altered blood

On shedding of the crusts, several types of residual scar could be recognised There were depressed scars, paler than the normal skin, with a tissue paper type of epidermal atrophy and hyperpigmented scars with partial loss of hair Larger and deeper scars showed white epilated centres surrounded by a hyperpigmented partially epilated zone which merged peripherally with normal skin and hair There were also varioliform pits, some normally and others excessively pigmented, and scars of pinhead size, seen mostly on the back of the neck The two largest scars were on the scalp they were each 4 cm across and were hairless numerous smaller (2 cm) scars scattered over the scalp showed varying degrees of cicatricial alopecia The forehead along the hair margin had been severely scarred and on the face itself the nose and circumoral area were worst affected Here a number of varioliform pits were present Numerous flat slightly depressed scars, 1–2 cm across, were evident on the extensor aspects of the forearms and dorsa of the hands and a similar state was found on the thighs legs and dorsa of the feet On the upper thighs only a few dark varioliform pits were present On the palms there was a stippled obliteration of the papillary ridges in places where there had been small lesions In two scars on the legs symmetrically placed near the heads of the fibulæ, the atrophic epidermis was ballooned out by a firm, slightly tender underlying growth suggesting keloid formation there was no keloid elsewhere

One of these swollen scars was partially excised with a portion of the adjoining skin In Wood's light this piece of tissue showed no fluorescence After examining it histologically Dr J F Murray reported That fragment which lay in the normal area shows slight subepithelial œdema of the corium and dilation of the capillary vessels There is very slight perivascular round-cell infiltration in the upper corium. The collagen bands are loose and broad in this area and there is a marked increase in number and calibre of the elastic fibres which are markedly fragmented The fragment of skin which lay in the 'tumour shows closely packed narrow bundles of collagen resembling scar tissue In this area elastic tissue fibres are almost completely absent and those which exist are small and narrow The scar tissue extends up to the basal layer In both areas the pigmentation of the basal layer is well marked but does not appear to be increased and no aberrant pigment has been found There is no evidence of keloid or of neoplasia'

A few small deep seated purpuric spots were noted on the dorsal aspect of the hands and fingers In this region there were also many epithelial elevations, each about the size of a grape seed situated around but not over the prominences of the knuckles and in the dorsal aspect of the interdigital webs These were taken to be milia

All the exposed parts showed slight hyperpigmentation, coarseness and inelasticity of the skin these features being most evident on the back of the neck. The skin generally was dry and powdery, sweating was not observed The child wore a short sleeveless dress, and—in contrast to the unprotected areas—the skin covered by this garment was free from signs of present or past involvement The nature and distribution of the primary lesions and their residual scars established the diagnosis of hydroa aestivale

Fingers and Toes—The fingers were claw like and restricted in range of movement at all joints the hand could neither be placed flat nor clenched The palms were moderately hyperkeratotic and stiff The skin around the digits was tightly drawn, creating a spurious impression of a fusiform thickening around the joints The pulp of the terminal phalanges was sclerotic translucent, retracted and devoid of papillary ridges The child was right-handed and these changes were especially noteworthy in the thumb, index, and 5th fingers of that hand Following this atrophy the paronychial tissue had been drawn away as it were from the sides of the nails, leaving them projecting well over the finger tips On the radiographic appearances Dr C Komins reported 'There is erosion of the terminal phalanges of the thumb 2nd and 3rd fingers and possibly the 5th as well Nicks into the tufts of the terminal phalanges of both ring fingers are evident Further, the phalanges of the 1st and 2nd fingers show early development of the so-called st deformity The soft tissues of the fingers show correspondi changes An unusual feature is that there appears to be accessory epiphysis in the middle and ring fingers'

All the nails of the hands showed dystrophic changes, a spontaneous detachment had occasionally occurred T nail plates were ridged longitudinally and transversely, bei 2–6 mm in thickness at their free edges The right thumbn was beak like In Wood's light the nails appeared dull

The toes were splayed, slender and tapered There w no atrophy or sclerosis comparable with that seen on t fingers One great toenail had been shed and the oth nails showed varying transverse lamination and developme of spoon shape The soles of the feet were supple and show no thickening or scarring

The Hair—The scalp hair was of normal growth a extent except in the upper forehead where the hairline h receded irregularly because of numerous scars The eyebro were thin and separate from one another a few longer a more curly hairs in their outer thirds gave them a slight bushy appearance Eyelashes were normal There was small growth of curly hair in the apex of each axilla pub hair was absent On the sides of the cheeks, in an ar roughly coincident with that occupied by the side whisk in an adult male, there was a thick growth of fine silk and only slightly curly hair Above it was contiguo with the scalp hair just in front of the ear, but was clear demarcated from it by obvious textural differences Ind vidual hair shafts were about 15 mm in length The ha was densest just behind the angle of the jaw and the grow extended down just below the lower edge of the horizont portion of the mandible The upper and lower lips a chin had no prominent hairy covering Between the out ends of the eyebrows and the scalp hair of the temples a outer forehead was found a zone of silky hair, each sha of which was about 20 mm long The central part of t forehead had a sparse covering of short soft hairs while t nose, eyelids, and malar areas were without hair The was slight hairiness of the back and sides of the neck C the posterior and lateral aspects of the arms, on the extens aspects of the forearms and on the legs there was a le conspicuous but definite hairiness Hairs were about 15 mm long and stood at irregular angles on the skin surface

General Clinical Findings

Teeth—All the milk teeth were said to have been a obvious red or pink colour Except for the third mola she had a completely erupted set of permanent teeth with light brown tinting of the crowns In Wood's light the fluoresced with a soft rose pink colour, and an even mo brilliant pink was emitted from the exposed roots whe the gums were retracted On turning down the lower l the roots of the teeth imbedded in the mandible fluoresce brightly through the gums while the intervening bone d not Dr M M J Shapiro, who collaborated in the observations is preparing a full report with a review of t subject for the South African dental press

Bones—In the living subject it is a difficult task to establis the presence of slight pigmentation of the bones by anythin less than a biopsy Among the gentler procedures, Mack and Garrod's (1926) method of trans illuminating the finge was attempted but proved a failure because of the scleros and pigmentation of the soft tissues Fraenkel (1924) i any case considered the technique unreliable Inspection the maxilla and mandible through the mucoperiosteum i the mouth was inconclusive No definite discoloration these bones could be seen in sunlight nor did they fluores in Wood's light

Ears Eyes and Nose—The upper curve of the helix of eac auricle was hyperpigmented no milia were present Ther was a supernumerary tubercle above the tragus on eithe side The ear drums were normal The portion of th bulbar conjunctiva occupying the palpebral fissure was diffuse yellow brown colour and conspicuously thickene This thickening extended slightly across the lateral edge the limbus on either side In Wood's light these area fluoresced a bright white, and looked rather like milk-curd No further abnormalities were noted in the internal an external examination of the eyes The nasal vestibule wa slightly shrunken and inelastic The bridge of the nose wa flat, but the septum was normal apart from a slight deflection

On rhinoscopy Dr C Aronson reported a clinical pictur compatible with an allergic rhinitis Radiography reveale clouding of the left maxillary antrum attributed to thickenin

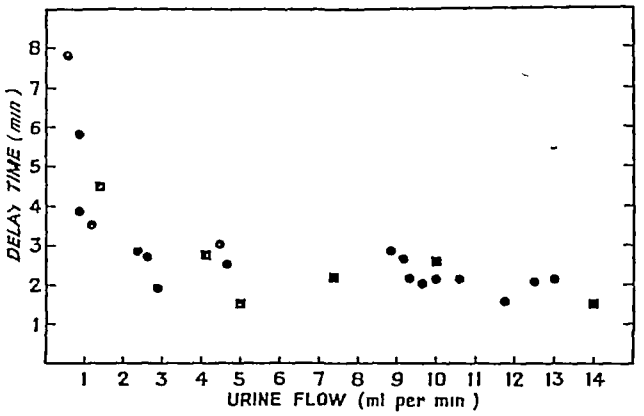

Fig 2—Relation of delay time to urine flow circles denote P.A H average delay time of each experiment shown in the accompanying table, squares denote methylene-blue delay time

Results are shown in the accompanying table and figs 1 and 2

DISCUSSION

The table gives the total delay time from the ante cubital vein to the end of the urinary catheter, this includes (*a*) the arm to kidney circulation time, (*b*) the kidney to bladder delay time, and (*c*) the delay time due to the urinary catheter We include the last two in "renal tract delay time" With urine flows below 2 ml per minute the five observations we have made seem to indicate an inverse relationship between total delay time and urine flow But, at such rates of flow, small errors in urine collection may introduce considerable errors in the calculation of delay time and dead space, and we believe that this method of estimation gives only a rough guide, and we have not proceeded further

With urine flows above 2 ml per minute the method is more accurate, and with flows between 2 and 14 ml per minute total P A H delay time in 14 people was between 1 5 and 3 1 minutes, with an average of 2 4 minutes, and the corresponding dead space was between 5 4 and 30 7 ml The methylene blue delay time in 5 people ranged from 1 5 to 2 7 minutes, with an average of 2 2 minutes Allowing a circulation time from arm to kidneys of 12–18 sec, this gives an average renal tract delay time from the kidney to the end of the catheter of about 2 1 minutes

This unexpected constancy in delay time at rates of urine flow between 2 and 14 ml per minute implies that the renal tract dead space is capable of expanding from 5 4 to 30 7 ml This is well shown in cases 3, 5, 9, 10, and 15 (see table), on each of whom two observations were made at different rates of urine flow

The site of this increased capacity of the renal tract at high rates of urine flow is a matter of speculation The only parts distensible to the required degree are the bladder, the renal pelves, and possibly the tubules, we tried to measure the bladder dead space in our patients by injecting 5 ml of physiological saline solution into the bladder through the urinary catheter and promptly withdrawing the bladder contents into the same syringe If the bladder dead space had expanded from 0 to 10 ml, it would be reasonable to expect that the injection of 5 ml of saline would be followed by the withdrawal of 15 ml of saline plus urine We found that, if the process of injection and withdrawal took x sec, the volume of fluid withdrawn was regularly 5 ml plus the amount of urine formed in x sec, and this process could be repeated This observation implies that in these cases the bladder dead space approximated to zero and that the renal pelves and/or the tubules were the site of the renal tract expansion

SUMMARY

Results are reported on twenty four observations of renal tract delay time and dead space (kidney to end of urinary catheter) in 17 people

When the urine flow was between 2 and 14 ml per minute, the renal tract delay time (including the urinary catheter) was between 1 3 and 2 8 minutes and averaged 2 1 minutes

This implies that the renal tract dead space can increase in volume from 5 4 to 30 7 ml Some evidence is presented suggesting that this increase in volume occurs in the renal pelves and/or the tubules

We wish to thank Prof E P Sharpey-Schafer and Dr F T G Prunty for the help and facilities they have given us in these observations, and Mr M G Ventom for technical assistance

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CONGENITAL PORPHYRIA, HYDROA AESTIVALE AND HYPERTRICHOSIS IN A SOUTH AFRICAN BANTU

G H FINDLAY
B Sc, M B Witwatersrand
OF PRETORIA

H D BARNES
M Sc, A R I C
OF THE BIOCHEMICAL DEPARTMENT, SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH, JOHANNESBURG

CASES of congenital porphyria are still rare enough to warrant reporting This case has the additional interest of being the first recorded in an African, although other forms of porphyrinuria have been found in that race (Barnes 1945, Barnes, in preparation)

CASE REPORT

The patient, a girl of 13 belonging to the Barolong tribe, was the only child of first cousins She had three normal half brothers from two other marriages of her mother Her father had disappeared and could not be traced Her mother was short in stature but not otherwise abnormal, porphyrins were not detected in her urine No other member of the family had any comparable disease

History

She is said to have been completely well until the age of 11 months, when her urine became red, and certain skin lesions and an overgrowth of hair appeared on the face Since then the abnormal colour of the urine has varied in intensity but never entirely disappeared, it has possibly been more obvious in midsummer Skin lesions have always been present, involving at different times most of the exposed surfaces of the body, to which they have been confined They were most abundant during mid childhood and have been less numerous for the past year or two. No association has been noted between change of season and the severity of the skin lesions, but the child lives in the Transvaal, where the sunshine is bright throughout the year Though there is no conclusive evidence that lesions have resulted from knocks or friction, it is stated that the skin tends to break down readily after minor wounds and scratches Apart from an extension to the limbs the hairy overgrowth has shown no noteworthy change in the recent or remote past

The relations did not regard the child as abnormal except for the skin condition, and no internal complaints or crises of pain had ever been noted

Dermatological Findings

The Skin—Our observations extended intermittently over several months During this time four bullæ were seen on

The examination of the liver (function tests, histology) and electrophoretic fractionation of the serum proteins yielded distinctly abnormal results These are difficult to evaluate because South African Natives often show pathological values in these tests when judged by European standards Furthermore these observations were not always made on earlier cases of congenital porphyria, so it would be premature to attach a meaning to them

The ætiology of the skin lesions remains obscure The names hydroa aestivale and epidermolysis bullosa have both been used according to whether light or trauma seemed to the user to be predominant in producing bullæ If sunlight is responsible for producing the skin lesions, it is significant that our patient's racial pigmentation offered her no real protection In at least one case (Gray, Rimington, and Thomson 1948) the effectiveness of these stimuli appeared to alter In our opinion it is not possible to distinguish separate clinical forms of these cutaneous conditions when they are associated with porphyria and when they occur apart from it It is likely, therefore, that no causal relationship exists between the skin lesions and porphyria but rather that they are linked genetically Experiments to demonstrate a causal connection between bulla formation and skin sensitisation by porphyrin have largely failed (Blum 1941)

The trauma of everyday life seemed to be responsible for a measure of the sclerosis and deformity of the hands In a right handed person this change would be most developed in that hand, and in fact the tips of the right thumb and index fingers showed the greatest degree of sclerotic atrophy This suggested that we were dealing with a pure traumatic sclerosis which was not a sequel of bulla formation Brunsting and Mason's (1946) case where the right hand was reported as being more disabled than the left appeared to support this conclusion. Against it stands the persisting suppleness of the soles in spite of far heavier traumatic insults from walking barefoot in the country

The prognosis in congenital porphyria whether it is treated or not, is difficult to assess A combination of poverty and ignorance in our patient prevented us from instituting a régime of protection from the sun, and the short course of crude liver injections she was given brought no clinical improvement Many of the earlier reports indicate that intercurrent pulmonary tuberculosis is a common cause of death. The famous case, Matthias Petry, died at the age of 32 The later history of Gray's (1926) patient is of considerable interest this girl showed a blood picture not unlike that in our case, and over a period of 4 years the anæmia had slowly advanced At the request of Sir Archibald Gray, Dr G Stewart Smith, pathologist to the Royal Devon and Exeter Hospital, has kindly furnished the post-mortem findings on her She ultimately died at the age of 31 with a severe degree of anæmia, and myocardial failure apparently consequent on the anæmia Sir Archibald Garrod's case, G.L., is known to be still alive and is now in his thirties We are informed that he has suffered considerable scarring and mutilation despite rigorous precautions against exposure

SUMMARY

A case of congenital porphyria is described in a Bantu girl of consanguineous parentage The ætiology, clinical features, and prognosis are briefly discussed.

We are much indebted to Dr Murray, Dr Anderson, and Dr Gillman for the special investigations acknowledged in the text and to the South African Iron and Steel corporation for the lutidine One of us (G H F) wishes to thank Dr Davison and Dr Winter of the Pretoria Leper Institute, for referring the case to him and Dr A. Altmann, pædiatrician at Baragwanath Hospital, for facilitating investigations

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INTERSTITIAL INGUINAL HERNIA

REVIEW OF SIX CASES

T J NOONAN
M.B N U I.
LATE SURGICAL OFFICER, ST LUKE'S HOSPITAL, ANUA, NIGERIA

MUCH has been written about interstitial hernias, and probably the most complete accounts are those of Lower and Hicken (1931) and Thunig (1943) As the name indicates, they are hernias in which the sac does not follow the usual course found in ordinary inguinal hernias but lies between the various layers of the abdominal wall Lower and Hicken collected 590 published cases and found that the ratio of male to female was about 4 to 1 Most authorities, however, consider that this ratio is much higher and that interstitial hernia is rare in the female

ÆTIOLOGY

It has been held since the days of Krönlein that the ætiological factor is some obstructive condition in the inguinal canal, the commonest cause being maldevelopment or arrested descent of the testis, hence the preponderance in the male Moynihan (1900) cited Macready's figures of 129 cases, in 67% of which the testis was either completely retained or had only partially descended Hutchinson (1923) thought that the lax mesorchium of such a testis rendered it abnormally mobile, allowing it to be displaced upwards or outwards by muscular exertion and so produce a pouch of processus vaginalis between or behind the muscles of the abdominal wall Edington (1942), however, reported a case associated with an undescended testis which had, in addition, a scrotal sac

Other abnormalities which have been noted in association with these hernias are (1) a small external ring, (2) an external ring closed by adhesions due to a badly fitting truss, (3) absence of the cremaster muscle, and (4) superimposition of the abdominal rings At least one case has been reported where the cause was a hydrocele of the canal of Nuck At one time it was erroneously believed that forcible and oft repeated efforts at reducing an ordinary inguinal hernia might lead to the formation of an interstitial sac, but such attempts could only lead, when no diverticulum is present, to displacement of the whole sac or rupture of its neck Displacement of the sac leads to reduction en masse and not a true interstitial hernia

CLASSIFICATION

McGavin (1932) classified interstitial hernias into (1) those in which an interstitial sac alone is present and (2) those with, in addition, a patent processus vaginalis The generally accepted classification, however, is that of Fuld (1921)

(1) *Properitoneal*—The sac lies between the peritoneum and fascia transversalis It is usually directed towards the anterior superior iliac spine, but sometimes it may be towards the bladder or even the obturator foramen

(2) *Inguino interstitial*—The sac may lie between the various layers of the abdominal wall (*a*) between the transversalis fascia and the transversalis muscle, (*b*) between the transversalis and internal oblique muscles, (*c*) between both

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of the mucosa only The lips were dry, scaling, and inelastic, and the gums were swollen and septic The buccal cavity generally showed no abnormality

The *liver* was clinically normal Aspiration liver biopsy was performed (Dr M H Shnier), and the specimen submitted to Dr T Gillman who made the following observations Ultraviolet light microscopy showed no porphyrin in the liver There was only a fluorescence ascribed to vitamin A Schar lach R preparations showed a moderate fatty infiltration of the liver cells, but the fat stained an orange colour suggesting that it was present in combination with other organic sub stances Slides subjected to the prussian blue test for iron showed fine granular deposits in the liver cells with a certain quantity of iron in " bound " form as shown by green staining There was no cirrhosis or other disease, but the cytoplasm of the liver cells had a somewhat " washed out " appearance such as Dr Gillman recalled having seen during the recovery phase of pellagra, and also in the livers of cases dying from shock or acute hæmorrhage

The *spleen* was enlarged to a point 1 in below the left costal margin. Two enlarged lymph glands were felt—one in either axilla—but none elsewhere Clinically and radiologically the *heart* and *lungs* were normal

Dr R Geerling, neurologist, confirmed the fact that the central and peripheral *nervous systems* were intact The child was shy but intelligent

Endocrine Glands—The pituitary fossa was radiologically normal, the thyroid was normal to palpation, there was no radiological evidence of thymic enlargement, and abdomi nal examination revealed no masses to suggest adrenal or ovarian neoplasm, or indeed any other disease The urinary 17 ketosteroid excretion was within normal limits The external genitals were not abnormal, the menarche had not yet occurred, and the breasts were undeveloped

Laboratory Investigations

The icteric index was normal and the van den Bergh reaction negative The thymol turbidity test yielded a result of 3 5 units, the thymol flocculation test was + positive, and Ucko's modification of the Takata Ara reaction +++ positive Serum albumin was 4 6 g and serum globulin 4 4 g per 100 ml Electrophoretic analysis of another specimen of serum by Mr C G Anderson showed the following percentage distribution albumin 43 (normal average 59), α globulin 8 4 (n a 14), β globulin 13 2 (n a 14 3), γ globulin 35 5 (n a 11 8) Serological tests for syphilis were negative The blood serum showed no fluorescence suggestive of porphyrin

Bone marrow and Blood—Smears of the bone marrow fluoresced an orange colour under the ultraviolet microscope It was impossible to decide where this fluorescent substance (porphyrin) was situated

Dr J F Murray reported that the bone marrow was hypercellular (total nucleated cells, 185,500 per c mm) There was an increase in normoblasts (22 4%) There was also a slight myeloid and erythroid preponderance (myeloid/erythroid ratio, 1 9 1, myeloid/lymphoid ratio, 8 6 1) In other respects the marrow was normal (Murray 1949) The peripheral blood showed slight anæmia and leucopenia, with 2 normoblasts per 100 leucocytes Red cells 4,300,000 per c.mm , Hb 12 1 g per 100 ml , white cells 3500 per c mm (neutrophils 68, monocytes 6, lymphocytes 26), packed cell volume 36, reticulocytes 1 8% No punctate basophilia or increase in diffuse polychromasia was observed

Urine—Routine examination of the urine gave normal results Its colour varied in successive specimens between cherry red and deep burgundy On standing, some darkening occurred

Direct spectroscopic examination of the urine showed a fairly intense absorption band at about 500 mμ and two other bands in the green suggestive of a metal porphyrin complex No band could be seen in the red On adding hydrochloric acid the spectrum changed to that of acid porphyrin On adjusting the pH of the urine to 3 1 with hydrochloric acid a dark flocculent precipitate soon formed which was collected by centrifuging The supernatant urine was distinctly less red than the original and a deep layer showed complete absorption of the violet and blue and a narrow band at 625 but no absorption in the green In a 1 in tube a strong band at 500 was seen The intense band at 500 which persisted after flocculation of the porphyrin was out of proportion to the weak Schlesinger reaction for urobilin The porphobilinogen reaction was repeatedly negative even in an alkaline urine obtained after oral administration of a potassium citrate mixture

The dark flocculent precipitate was treated with acetic acid and shaken with ether which removed some of the pigment Both fractions were dissolved in hydrochloric acid and ammonia added cautiously until flocculation occurred The precipitates were separated by centrifugation, drained, washed with distilled water and dissolved in dilute ammonia. From both these solutions chromatograms were made on paper strips (Nicholas and Rimington 1949) and fluorescent spots were shown at the following Rf values

Ether-soluble			0 30	0 44	0 56	0.[illegible]
Insoluble	0 12	0 18	0 30	0 46	0 58	

The bold figures represent strongly fluorescent spots, all the rest were faint or very faint

Porphyrin was recovered in the above manner from about 3 litres of pooled urine The absorption bands of the ether insoluble fraction were measured in acid and alkaline solutions by means of a Hartridge reversion spectroscope

In 2*N* HCl	552	574	595 mμ	
In 10% NaOH	507	541	573	614 mμ

Methyl esters were prepared from both fractions of the porphyrin and after two recrystallisations the uroporphyrin ester melted at 288°C and the corpo porphyrin ester at 245–247°C. The mother liquors which still contained porphyrin esters were kept but not further examined

Stools—About 50 g of formed stool were dried with acetone and the residue extracted three times with acetic acid ether (1 : 4) This extract was washed with water and the porphyrin removed by several successive extractions with 2*N* hydrochloric acid After passing back and forth from ether to acid several times a strip chromatogram showed fluorescent spots with the following Rf values

Fæcal porphyrin		0 66	0 70	0.[illegible]
Ether soluble porphyrin from urine	0 62	0·69		0.[illegible]

Our " lutidine," a gift from the South African Iron and Steel Corporation, was a complex mixture of tar bases boiling over a wide range In consequence its behaviour was less uniform than that used by Nicholas and Rimington (1949) and chromatograms run on different days showed considerable variation

The spectra of the fæcal porphyrin measured in acid and alkaline solution with the reversion spectroscope were

In 2*N* HCl	548	581		591 mμ
In 10% NaOH	508	543	571	617 mμ

Typical coproporphyrin I methyl ester crystals melting at 245°C were obtained in the usual manner The mother liquor was not further examined

The above findings correspond with those reported in other cases of congenital porphyria—namely, uroporphyrin I and coproporphyrin I predominating in the urine and coproporphyrin I in the stool

DISCUSSION

Our case raises no problems in diagnosis or classification The biochemical findings and the pigmentation of the teeth are typical of congenital porphyria as described in the original classification of Hans Gunther (Garrod 1923) The skin lesions are also typical of hydroa aestivale, which, since M'Call Anderson's (1898) time, has been known to be associated with porphyrinuria If one excludes adult cases with skin lesions and porphyria, where the bones and teeth are unpigmented and the porphyrin excretion appears to be less abundant the congenital type is seen to be by far the least common type of porphyria

Our case corresponds most closely with the girl described by Sir Archibald Gray (1926), she too exhibited an overgrowth of hair Hypertrichosis is an unusual finding in congenital porphyria, and it may have a genetic basis in view of the normality of the endocrine glands Furthermore, in all the reported instances of hypertrichosis and porphyria we know of, the cases were women This stands in contrast with the usual predominance of men affected by the genetically recessive form of hydroa aestivale and porphyria

Mackey and Garrod (1926) observed that splenomegaly is usually first detected in the second decade or slightly earlier, our findings agree with this

The examination of the liver (function tests, histology) and electrophoretic fractionation of the serum proteins yielded distinctly abnormal results These are difficult to evaluate because South African Natives often show pathological values in these tests when judged by European standards Furthermore these observations were not always made on earlier cases of congenital porphyria, so it would be premature to attach a meaning to them

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oblique muscles, or (*d*), rarely, between the fibres of the internal oblique muscle

(3) *Inguino superficial* (Küster's hernia)—The sac lies between the external oblique and Scarpa's fascia The sac may go laterally towards the anterior superior iliac spine, upwards and medially, or downwards over the femoral ring

The only published statistics on the relative frequency of each type of interstitial hernia are those of Lower and Hicken (1931), who in their series of 590 cases found 119 of the properitoneal type, 348 of the inguino interstitial type, and 123 of the superficial type Biasini (1948) reviews his experience with 3 cases of the pro peritoneal type, which represent 0 31% of the hernias encountered at his clinic

ANATOMY OF THE SAC

Moynihan (1900) has stated that bilocular sacs must be present Wilensky and Gordon (1939), however, state that about a third of the recorded cases have monolocular sacs In many inguinal hernias, especially scrotal ones, there is a secondary loculus in the region of the internal ring, but this by itself does not constitute an interstitial hernia A true interstitial hernia must have a sac large enough to burrow its way between the layers of the abdominal wall In bilocular sacs the shape is always that of an hour glass, and there is a common opening into the abdomen at the neck of the sac Biasini (1948) claims that in some cases there may be distinct openings, usually close together The inter stitial portion is to be regarded as a diverticulum of the primary sac (Thunig 1943)

DIAGNOSIS

The diagnosis of interstitial hernias has presented great difficulty in the past, chiefly owing to lack of know ledge of the condition Properitoneal hernias are the most difficult to diagnose and are rarely diagnosed preoperatively even when strangulated The other types, if reducible, are readily diagnosed, but it is impossible to distinguish between type 2 (*c*) and type 3 Trouble arises when they become strangulated A strangulated properitoneal hernia is almost impossible to diagnose as such, usually the most that can be said is that there is an acute obstruction Strangulation of the inguino interstitial or the inguino superficial types, if on the left side, may be mistaken for carcinoma of the colon with acute obstruction or even for a tumour of the abdominal wall A typical strangulated interstitial hernia shows signs of acute obstruction, a mass is present above Poupart's ligament, and the testis on the same side as the lump is absent from the scrotum In such a case the diagnosis is easy if one considers the possibility of interstitial hernia In a properitoneal hernia a lump is rarely palpable, hence the difficulty of diagnosis The reason for failure to diagnose interstitial hernias has been summed up by Beigler and O'Brien (1928)

> "It is seldom we make a preoperative diagnosis of other than the above types (direct and indirect) largely because we fail to recognise any other type of inguinal hernia This failure of recognition is probably due to the fact that most of us are unaware of the existence of inguinal hernias other than the usual types"

PERSONAL EXPERIENCE

In three years, at St Luke's Hospital, Anua, Uyo Nigeria, I operated on 4 simple and 2 strangulated interstitial hernias out of a total of 482 inguinal hernias The 4 simple ones were all in adult male patients and were inguino interstitial type (*c*)—i e, the interstitial sac lay between both oblique muscles In each case the sac extended out towards the anterior superior spine In 1 case it approached to within an inch of the lower right costal margin in the anterior axillary line In no case was there obstruction, the testes being normal and the external rings dilated In 3 cases there were bilocular sacs, large scrotal hernias being associated with the interstitial sac One patient had a monolocular sac but the external ring was sufficiently dilated to admit two fingers Diagnosis was obvious in each case, small intestine, which was readily reducible, being palpable almost under the skin No difficulty was encountered in freeing the interstitial sac through the usual inguinal incision

The 2 strangulations were in a man and in a woman The man had a properitoneal sac, and the woman an inguino interstitial type (*c*)

Case 1—A man, aged about 30, was admitted for repair of a left inguinal hernia Examination on admission showed nothing abnormal on the right side Later he complained of mild circumumbilical pain not associated with nausea or vomiting Examination revealed nothing unusual The pain persisted and became colicky, and after twelve hours the patient vomited once An enema produced a moderate result, a second given an hour later was retained Acute obstruction was diagnosed, and operation performed under 'Nupercaine'

Operation—A lower right paramedian incision revealed a mass the size of an egg in the region of the right internal ring An inguinal incision was then made, and a unilocular properitoneal sac containing strangulated ileum was discovered Division of the neck of the sac led to the return of the normal colour of the bowel The sac was removed at the level of the inferior epigastric vessels, and no repair was made The left side was operated on at a later date and the patient was subsequently discharged in good health

Case 2—A woman, aged about 40, was admitted with four days' abdominal pain, vomiting and constipation Examination showed much abdominal distension, and a tender lump was palpable in the right inguinal region between the anterior superior spine and the external ring but not coming through the latter Despite the fact that the patient had vomited many times she was not much dehydrated Her tongue, though dry, had not the rasp like feel observable in cases of late strangulation, and her urinary chlorides though diminished were still present. The patient received 1000 ml of saline solution intravenously and was treated by Wangensteen gastric suction preoperatively A strangulated interstitial hernia was diagnosed, and operation was done under local analgesia

Operation—The usual inguinal incision was made, and an inguino interstitial sac type (*c*) containing strangulated ileum was found The bowel was gangrenous and 6 in of it was resected A side to side antiperistaltic anastomosis was made, and the distal end closed Since the bowel wall was œdematous, the proximal end was left open and brought to the surface to decompress the suture line (a modification of McKenna's (1947) technique) Fourteen days later the ileostomy was closed and returned to the abdomen under thiopentone anæsthesia The canal was subsequently repaired, and the patient was discharged in good health

SUMMARY

Interstitial hernias, though unusual, are liable to be met with in any large series of cases

Apart from those which are properitoneal the diagnosis is easy

Two cases of strangulated interstitial hernia are reported in detail

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MATERNAL AND FŒTAL TITRES OF ANTISTREPTOLYSIN AND ANTISTAPHYLOLYSIN AT DIFFERENT STAGES OF GESTATION

BO VAHLQUIST, M.D. RUTGER LAGERCRANTZ, MED. LIC.
FOLKE NORDBRING, MED. LIC.
From the Pædiatric Clinic of the Caroline Institute, Norrtulls Hospital, and the Central Municipal Bacteriological Laboratory, Stockholm

IT is commonly accepted that the antibodies which normally appear in the fœtus in utero are passive and transmitted from the mother through the placenta. This view is supported by the close relationship between maternal and fœtal titres at term for some types of antibodies, and by the comparatively rapid fall in the child's titres after birth.

Antigens are believed not to pass the intact placental barrier. A transfer of antigen from fœtus to mother in Rh iso-immunisation has been attributed to a local lesion of the villi. Such lesions have been demonstrated in serial sections of normal placenta (Naeslund and Arén 1947, Kline 1948) and in experiments with tagged erythrocytes (Naeslund 1950).

The facts so far known about the relationship between maternal and fœtal antibody titres *at term* are shown in table I.

The fact that the human placenta, like that of monkeys and rodents, is permeable to antibodies, whereas the placenta of ruminants, horses and pigs is not, has been attributed to the difference in the number of layers of cells separating maternal and fœtal blood (Ratner et al. 1927). But this cannot explain why some types of antibodies pass over more easily than others in man (table I). Differences in molecular size and shape of different antibodies are probably relevant; there may be a threshold mechanism preventing the passage of antibodies present in very low concentrations; and one cannot be certain that the passage of antibodies does not involve more complicated and more active processes than mere filtration whose speed is determined by the thickness and pore size of the placental barrier.

We have not found any report of investigations dealing with the development of the antibody titres in the human fœtus before term.

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Antivirus			
Measles +	Herrman (1923)		
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Allergens			
Skin-sensitising			Bell and Eriksson (1931), Sherman et al. (1940)
'Blocking'		Sherman et al. (1940)	

+ Molecular weight about 150 000 + + Molecular weight about 500 000 (Cohn 1947)

oblique muscles, or (*d*), rarely, between the fibres of the internal oblique muscle

(3) *Inguino-superficial* (Küster's hernia)—The sac lies between the external oblique and Scarpa's fascia The sac may go laterally towards the anterior superior iliac spine, upwards and medially, or downwards over the femoral ring

The only published statistics on the relative frequency of each type of interstitial hernia are those of Lower and Hicken (1931), who in their series of 590 cases found 119 of the properitoneal type, 348 of the inguino interstitial type, and 123 of the superficial type Biasini (1948) reviews his experience with 3 cases of the properitoneal type, which represent 0 31% of the hernias encountered at his clinic.

ANATOMY OF THE SAC

Moynihan (1900) has stated that bilocular sacs must be present Wilensky and Gordon (1939), however, state that about a third of the recorded cases have monolocular sacs In many inguinal hernias, especially scrotal ones, there is a secondary loculus in the region of the internal ring, but this by itself does not constitute an interstitial hernia A true interstitial hernia must have a sac large enough to burrow its way between the layers of the abdominal wall In bilocular sacs the shape is always that of an hour glass, and there is a common opening into the abdomen at the neck of the sac Biasini (1948) claims that in some cases there may be distinct openings, usually close together The interstitial portion is to be regarded as a diverticulum of the primary sac (Thunig 1943)

DIAGNOSIS

The diagnosis of interstitial hernias has presented great difficulty in the past, chiefly owing to lack of knowledge of the condition Properitoneal hernias are the most difficult to diagnose and are rarely diagnosed preoperatively even when strangulated The other types, if reducible, are readily diagnosed, but it is impossible to distinguish between type 2 (*c*) and type 3 Trouble arises when they become strangulated A strangulated properitoneal hernia is almost impossible to diagnose as such, usually the most that can be said is that there is an acute obstruction Strangulation of the inguino interstitial or the inguino superficial types, if on the left side, may be mistaken for carcinoma of the colon with acute obstruction or even for a tumour of the abdominal wall A typical strangulated interstitial hernia shows signs of acute obstruction, a mass is present above Poupart's ligament, and the testis on the same side as the lump is absent from the scrotum In such a case the diagnosis is easy if one considers the possibility of interstitial hernia In a properitoneal hernia a lump is rarely palpable, hence the difficulty of diagnosis The reason for failure to diagnose interstitial hernias has been summed up by Beigler and O'Brien (1928)

> "It is seldom we make a preoperative diagnosis of other than the above types (direct and indirect) largely because we fail to recognise any other type of inguinal hernia This failure of recognition is probably due to the fact that most of us are unaware of the existence of inguinal hernias other than the usual types"

PERSONAL EXPERIENCE

In three years, at St Luke's Hospital, Anua, Uyo, Nigeria, I operated on 4 simple and 2 strangulated interstitial hernias out of a total of 482 inguinal hernias The 4 simple ones were all in adult male patients and were inguino interstitial type (*c*)—i e, the interstitial sac lay between both oblique muscles In each case the sac extended out towards the anterior superior spine In 1 case it approached to within an inch of the lower right costal margin in the anterior axillary line In no case was there obstruction, the testes being normal and the external rings dilated In 3 cases there were bilocular sacs, large scrotal hernias being associated with the interstitial sac One patient had a monolocular sac but the external ring was sufficiently dilated to admit two fingers Diagnosis was obvious in each case, small intestine, which was readily reducible, being palpable almost under the skin No difficulty was encountered in freeing the interstitial sac through the usual inguinal incision

The 2 strangulations were in a man and in a woman The man had a properitoneal sac, and the woman an inguino interstitial type (*c*)

Case 1—A man, aged about 30, was admitted for repair of a left inguinal hernia Examination on admission showed nothing abnormal on the right side Later he complained of mild circumumbilical pain not associated with nausea or vomiting Examination revealed nothing unusual The pain persisted and became colicky, and after twelve hours the patient vomited once An enema produced a moderate result, a second given an hour later was retained Acute obstruction was diagnosed, and operation performed under 'Nupercaine'

Operation—A lower right paramedian incision revealed a mass the size of an egg in the region of the right internal ring An inguinal incision was then made, and a unilocular properitoneal sac containing strangulated ileum was discovered Division of the neck of the sac led to the return of the normal colour of the bowel The sac was removed at the level of the inferior epigastric vessels, and no repair was made The left side was operated on at a later date and the patient was subsequently discharged in good health

Case 2—A woman, aged about 40, was admitted with four days' abdominal pain, vomiting, and constipation Examination showed much abdominal distension, and a tender lump was palpable in the right inguinal region between the anterior superior spine and the external ring but not coming through the latter Despite the fact that the patient had vomited many times she was not much dehydrated Her tongue, though dry, had not the rasp like feel observable in cases of late strangulation, and her urinary chlorides though diminished were still present. The patient received 1000 ml of saline solution intravenously and was treated by Wangensteen gastric suction preoperatively A strangulated interstitial hernia was diagnosed, and operation was done under local analgesia

Operation—The usual inguinal incision was made, and an inguino interstitial sac type (c) containing strangulated ileum was found The bowel was gangrenous and 6 in of it was resected A side to side antiperistaltic anastomosis was made, and the distal end closed Since the bowel wall was œdematous, the proximal end was left open and brought to the surface to decompress the suture line (a modification of McKenna's (1947) technique) Fourteen days later the ileostomy was closed and returned to the abdomen under thiopentone anæsthesia The canal was subsequently repaired, and the patient was discharged in good health

SUMMARY

Interstitial hernias, though unusual, are liable to be met with in any large series of cases

Apart from those which are properitoneal the diagnosis is easy

Two cases of strangulated interstitial hernia are reported in detail

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MATERNAL AND FŒTAL TITRES OF ANTISTREPTOLYSIN AND ANTISTAPHYLOLYSIN AT DIFFERENT STAGES OF GESTATION

BO VAHLQUIST M.D RUTGER LAGERCRANTZ MED LIC

FOLKE NORDBRING MED LIC

From the Pædiatric Clinic of the Caroline Institute, Norrtulls Hospital, and the Central Municipal Bacteriological Laboratory, Stockholm

It is commonly accepted that the antibodies which normally appear in the fœtus in utero are passive and transmitted from the mother through the placenta This view is supported by the close relationship between maternal and fœtal titres at term for some types of antibodies, and by the comparatively rapid fall in the child's titres after birth

Antigens are believed not to pass the intact placental barrier A transfer of antigen from fœtus to mother in Rh iso immunisation has been attributed to a local lesion of the villi Such lesions have been demonstrated in serial sections of normal placenta (Naeslund and Irén 1947, Kline 1948) and in experiments with tagged erythrocytes (Naeslund 1950)

The facts so far known about the relationship between maternal and fœtal antibody titres *at term* are shown in table I

The fact that the human placenta, like that of monkeys and rodents, is permeable to antibodies, whereas the placenta of ruminants, horses and pigs is not, has been attributed to the difference in the number of layers of cells separating maternal and fœtal blood (Ratner et al 1927) But this cannot explain why some types of antibodies pass over more easily than others in man (table I) Differences in molecular size and shape of different antibodies are probably relevant there may be a threshold mechanism preventing the passage of antibodies present in very low concentrations, and one cannot be certain that the passage of antibodies does not involve more complicated and more active processes than mere filtration whose speed is determined by the thickness and pore size of the placental barrier

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In Sweden legal abortion provides an opportunity for the study of antibodies in the fœtus at an early stage of gestation From the antibody titres in premature infants and in those born at term one may obtain information concerning conditions in the late stages of gestation In this paper we report our results as regards antistreptolysin

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+ Molecular weight about 150 000 + + Molecular weight about 500 000 (Cohn 1947)

and antistaphylolysin Studies are now in progress along similar lines with other antibodies—e g , iso agglutinins and diphtheria antitoxin

MATERIAL AND METHODS

Antistreptolysin and antistaphylolysin titres were estimated in mother and fœtus (or infant) in 24 cases between 16 and 22 weeks (16 being between the 18th and 20th week) , in 14 cases between 30 and 39 weeks , and in 15 cases at term

The legal abortions were done by abdominal section Blood from the fœtus was obtained by heart puncture In most cases the indication for operation was either sociomedical or eugenic The samples from children born prematurely or at term were collected from the cord

Antistreptolysin titres were estimated by the technique described by Ipsen (1944), and antistaphylolysin titres by that of Packalén and Bergqvist (1947) One of us has previously reported on the normal values for antistreptolysin titres obtained with the same technique in adults (Lagercrantz 1948)

RESULTS

The results are summarised in table II, which shows a considerable difference in the titres of mother and fœtus between the 16th and 22nd week For antistreptolysin the ratio in individual cases ranged from 200 6 to 100 25 The antistaphylolysin titre in the mothers varied from <0 25 to 2 8, but in the fœtus it was never measurable with certainty , the difference between mother and child may of course have been as great as for antistreptolysin, but the "normal" level is too close to the minimal demonstrable level to show this

In agreement with the observations of Timmerman (1931), Wilson et al (1934), Gordon and Janney (1941), Bryce and Burnet (1932), and Vignes et al (1948) determinations at term show closely corresponding levels in mother and infant Exceptionally the level in the infant seems to be definitely higher than in the mother

It is of special interest to find out to what extent premature infants are provided with transmissible antibodies Since the level may depend on the degree of prematurity, our findings in this group are shown in table III with the duration of gestation in each case It will be seen that the antistreptolysin titres in mother and infant closely correspond even in the most premature cases The antistaphylolysin titres, on the other hand, tend to be somewhat lower in the infant in the most immature cases , though, with one exception (case 7), the difference is not very striking

TABLE II—NUMBERS OF MOTHERS AND FŒTUSES (OR INFANTS) AT DIFFERENT PERIODS OF GESTATION FOUND TO HAVE VARIOUS TITRES OF ANTISTREPTOLYSIN AND ANTISTAPHYLOLYSIN

Titre	Period of gestation					
	16–22 weeks		30–39 weeks		Full term	
	Mother	Fœtus	Mother	Infant	Mother	Infant
Antistrep						
<50	1	21	4	4	2	1
50–<100	4	3	1	1	6	5
100–<150	9	0	4	4	3	4
150–<200	1	0	0	0	0	1
200–<300	6	0	4	4	2	2
> 300	3	0	1	1	2	2
Total	24	24	14	14	15	15
Antistaph						
<0·5	12	24	5	9	6	6
0 5–<1	9	0	6	4	6	7
1 0–<1 5	2	0	2	1	2	1
1 5–<2	0	0	0	0	0	0
>2	1	0	1	0	1	1
Total	24	24	14	14	15	15

TABLE III—RELATION BETWEEN ANTISTREPTOLYSIN AND ANTISTAPHYLOLYSIN TITRES IN MOTHERS AND IN THEIR PREMATURE INFANTS

Case no	Weeks of gestation	Infant s birth weight (kg)	Antistreptolysin titres		Antistaphylolysin titres	
			Mother	Infant	Mother	Infant
1	30	1 3	125	125	0 36	0 *5
2	130	1 6	140	100	0 56	0 *8
3	31	1 4	200	200	0 70	0 25*
4	31	1 8	200	140	0 56	0·40
5	33	1 8	40	40	0 25*	0 25
6	33	2 1	400	400	0 80	0 56
7	34	2 4	100	70	4 00	0 25*
8	35	2 2	200	140	1 00	0 50
9	35	2 3	140	200	0 70	0 50
10	35	2 5	28	28	0 25	0 36
11	35	2 6	18	18	1 10	1 10
12	37	2 4	280	280	0 70	0 70
13	139	2 1	50	200	0 25*	0 25*
14	139	2 4	40	40	0 25*	0 25

* The reading was less than, but nearly equal to, this figure

DISCUSSION

According to Grosser's classification, the human placenta belongs to the hæmochorioidal type Only two layers of cells separate the blood of the mother from that of the fœtus During pregnancy the contact between the two vascular systems becomes successively more intimate, the trophoblast layer decreasing in thickness, the surface of the villi growing relatively as well as absolutely, and the number of fœtal capillaries within the villi multiplying

Using radioactive tracers Flexner et al (1948) and Hellman et al (1948) have shown that the exchange of sodium and water between mother and fœtus increases continually up to the last month of gestation The passage of sodium, calculated per unit weight of placenta, increases seventyfold from the 9th to the 36th week of gestation in man Immediately before term the ratio between the amount of sodium transferred to the fœtus and the amount retained was about 1 130 1 —i e , there was an extremely high "safety factor"

The molecular weights of the antibodies are very high, most of them belonging to the γ globulin fraction of the plasma with a molecular weight of about 150,000 It is impossible to compare the permeability of the placenta for electrolytes with that for antibodies

The results presented here show that antistreptolysins and antistaphylolysins are present in very low or undetectable concentrations in the human fœtus between the 16th and 22nd week of gestation In a group of premature infants born at 30–39 weeks, there was already a close correspondence between the titre in the mother and in the infant for antistreptolysin, whereas the figures for antistaphylolysin were somewhat lower in the infant in some of the most premature cases In agreement with earlier workers we observed a close correspondence for both types of antibodies in the infants born at term

Many of the antibodies in human blood are found in the γ globulin fraction of the plasma, the level of which is about 1 g per 100 ml Since the antibodies form only a minor part, it must not necessarily be assumed that alterations in the concentrations of one or several antibodies as observed by serological methods must be reflected in alterations of the γ globulin fraction determined by physicochemical methods Nevertheless it is of interest in this connection that Moore et al (1949), in investigations on the serum from six human fœtuses at 3–9 months, noted a continuous increase of the γ globulin fraction from very low to high normal values

SUMMARY

The close correlation in the titres for antistreptolysin and antistaphylolysin between mother and child at term is established in the second half of gestation

An analysis of the conditions in 24 fœtuses aged 1–22 weeks showed consistently lower values in the fœtus than in the mother (table II)

Children born prematurely (between the 30th and 40th week) already showed a close correspondence between fœtal and maternal titres for the antistreptolysin, but not quite so good for the antistaphylolysin (table III)

We thank the chief physicians of the maternity clinics at the Sabbatsberg Hospital, Prof P Wetterdahl, and the Ulmänna B.B, Docent S Karlson, for their kind coöperation in collecting the material. Mrs Lekeberg assisted carefully in the laboratory work

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"It is generally accepted that children are specially liable to suggestion As to suggested actions, this is partly due to their impulsiveness but as to suggested ideas and beliefs it is partly due to their ignorance Thus there are rational grounds for the suggestibility of children to which some psychologists do not give adequate attention. Children usually accept for example, the statements of their parents, believing even some fairy tales with readiness One reason is that they have little on which to base any criticism of the ideas They also tend to find such stories lively and pleasing so that a friendly and pleasant mood is established in which the tendency to accept and believe is strong for we are naturally more critical and suspicious when unhappy But there is another good reason why children should be more suggestible So many things have been told a child without evidence by his father or mother, which he has later found to be true—all the many little facts of everyday life about which he receives instruction so that he not unreasonably comes to the conclusion that everything told him by grown ups will be true Later however he becomes more critical He finds some stories false"—Prof G W VALENTINE, D.PHIL., *Psychology and its Bearing on Education* London, 1950, p 101

OBSTRUCTION OF THE INFERIOR VENA CAVA BY A LEIOMYOSARCOMA

N J ROUSSAK
B Sc, M B Manc, M.R C.P
MEDICAL REGISTRAR, MANCHESTER ROYAL INFIRMARY

J D HEPPLESTON
M B Manc
ASSISTANT LECTURER, DEPARTMENT OF PATHOLOGY, MANCHESTER UNIVERSITY

OBSTRUCTION of the inferior vena cava is uncommonly diagnosed and even more rarely confirmed during life The ætiological basis in the case to be described was a pathological rarity

CASE REPORT

A 60 year-old man was admitted to the Manchester Royal Infirmary under the care of Dr A H Holmes on Dec 20, 1948 He complained of progressive swelling of the lower limbs and back over the last 6 weeks This had commenced above the right ankle, spreading shortly afterwards to the left side, and within about 3 days both lower limbs were affected up to the groins There had been transient aching pain in the lumbosacral region which had ceased when he went to bed With rest the swelling partially subsided over the next 5 weeks The patient stated that he was otherwise in good health, and had not lost weight

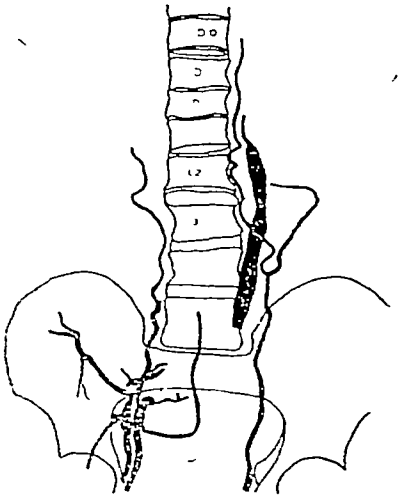

Fig 1—Venogram (tracing of X ray photograph) The inferior vena cava is not outlined An enlarged ascending lumbar vein is seen on left.

He was a sparely built man with moderate œdema of both lower limbs, more marked on the left side The buttocks and sacral region were also œdematous, but not the abdominal wall There were two rather tense veins about 2 mm in diameter on the anterior surface of the right leg below the knee Other physical findings were normal

During the next month a left sided varicocele developed and a prominent vein appeared over the right costal margin anteriorly, the blood flow in which was upwards A spontaneous diuresis was noted soon after admission and this continued for about a month, the œdema diminishing No albuminuria was found although the urine was frequently examined On admission the blood-count was red cells, 4 490 000 per c mm Hb 84% colour index 0 93 white cells 8000 per c mm with a normal differential count Serum-albumin was 3 2% serum globulin 2 6% and serum alkaline phosphatase 14 units per 100 ml microscopy of the urine did not show any abnormality On Jan 6 the serum-alkaline phosphatase rose to 17 units per ml and on Jan 19 to 22 units X ray films of the chest, skull and dorsolumbar spine were normal but that of the pelvis revealed a small area of mixed sclerosis and translucency in the superior ramus of the left pubis which was interpreted as either a metastasis or localised Paget's disease An intravenous pyelogram suggested an abnormality of the left kidney but the retrograde pyelogram did not confirm this

It was clear that the physical findings and investigations did not point to any of the common causes of œdema and by a process of exclusion a provisional diagnosis of obstruction of the inferior vena cava was reached On Jan. 6, Prof A M Boyd carried out venography injecting 20 ml of 30% diodone into the right femoral vein, which was found to be partially thrombosed The venogram (fig 1) showed no evidence of filling of the inferior vena cava the dye

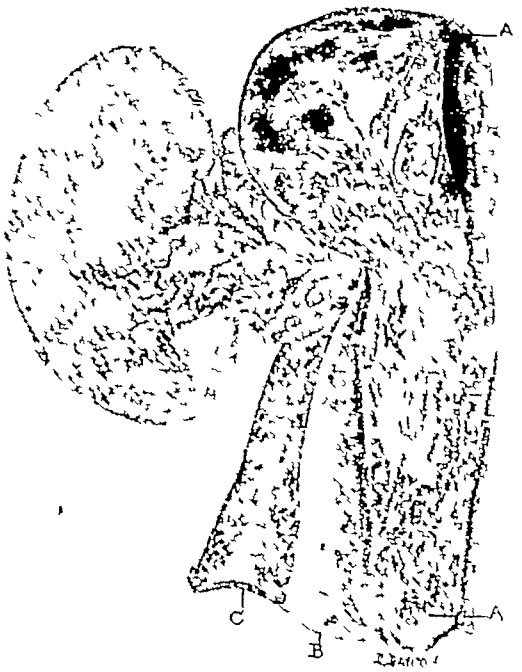

Fig 2—Drawing showing tumour (A) inferior vena cava (B), and posterior surface of aorta (C)

outlining veins in the abdominal wall and also a large venous channel 1 25 cm in diameter, lying over the transverse processes of the lumbar vertebræ on the left side The latter was interpreted as an enlarged ascending lumbar vein The patient, who had hitherto felt well, suddenly vomited on Feb 1 and again the next day, but had no pain The edge of the liver was now felt about 2 5 cm below the right costal margin, it was non tender, firm, and smooth There was no jaundice, the spleen was not felt, and ascites was not present He became unconscious without other changes in the physical findings, and died the following day

Post mortem Findings

At necropsy (J D H) the abnormalities discovered were limited to the inferior vena cava, liver, and pubis

The inferior vena cava was grossly dilated from its origin to the diaphragm Within it, and causing complete occlusion, was a sausage shaped tumour 17 5 cm long and 2–5 cm wide, with a smooth greyish red surface (fig 2) The tumour could not be separated from the upper part of the abdominal vena cava, it did not spread down the renal veins The right spermatic vein was also dilated and filled with uniform dark red clot Both iliac veins were of small diameter with thickened walls and a lumen could not be demonstrated satisfactorily

The liver, which weighed 1325 g, showed marked passive venous congestion, and the hepatic veins were filled with homogeneous dark red clot The kidneys were not congested, there were two or three enlarged vessels passing from the renal capsule to the perirenal tissue on each side The spleen was congested and weighed 130 g The superior ramus of the left pubis was thickened

Histology—The tumour was a leiomyosarcoma, consisting of interweaving bundles of smooth muscle cells which in one part showed malignant pleomorphism (fig 3), the cells varying in size and shape and the ratio of nucleus to cytoplasm being increased The nuclei were also irregular some being multilobular and others showing mitosis

In other parts the cells were more regular and loosely arranged with occasional intercellular hæmorrhages The vessels within the tumour consisted of a layer of endothelial cells supported by a small amount of fibrous tissue The liver showed intense venous congestion which extended to the periphery of the lobules, with centrilobular necrosis and fatty changes in the mid zones, there was no organisation of the hepatic venous clot The kidneys showed no evidence of venous obstruction The thickened pubis was a localised area of Paget's disease

DISCUSSION

Sporadic cases of obstruction of the inferior vena cava were recorded during the last century, Battle (1887) reporting 3 cases and describing fully the variability of the clinical picture One of the first large series to be reviewed was that of Pleasants (1911) who collected 296 cases from the literature and added 18 from the Johns Hopkins Hospital records Of these, 54% were due to thrombosis (over half of which were secondary to puerperal sepsis and other infective states) and 25% were associated with neoplasms

The following causes of obstruction of the inferior vena cava have been given

1 *Pressure on the vein by tumours of pancreas or kidney*, retroperitoneal sarcoma, aortic aneurysm, syphilitic liver, ascites, or enlarged glands The obstruction is often completed in such cases by thrombosis

2 Disease of the wall of the vein, including syphilitic and tuberculous phlebitis and neoplasia

3 Obstruction within the lumen, due to thrombosis originating in the vein or spreading into it from iliac or pelvic veins or hepatic veins in cirrhosis, or to extension of new growth along the renal or suprarenal veins in primary malignant disease of these organs Reports have been collected of 51 cases secondary to hypernephroma, usually of the left kidney (Ney 1946) Thrombosis may be primary or secondary to infectious diseases (typhoid, puerperal sepsis), distant neoplasia, or trauma

Classical symptoms of obstruction of the inferior vena cava are œdema of the lower part of the body and the development of engorged, sometimes varicose, veins on the abdomen, flanks, lumbar region, and lower extremities, in which the direction of blood flow may be shown to be upwards Ascites is not a sign of this condition Disease processes in general, however, do not always present the classical picture, and the subject under discussion is no exception The degree and extent of œdema depend on the completeness and rapidity of onset of the obstruction, sudden obstruction tending to cause more œdema than a gradual onset, which allows time for collateral vessels to dilate Œdema may last a considerable time and lead to ulceration of the legs, or it may soon abate if an efficient collateral circulation becomes established In our patient the spontaneous diuresis with lessening of the œdema was striking The distribution of the œdema may be atypical, sometimes affecting only one lower limb, possible reasons advanced

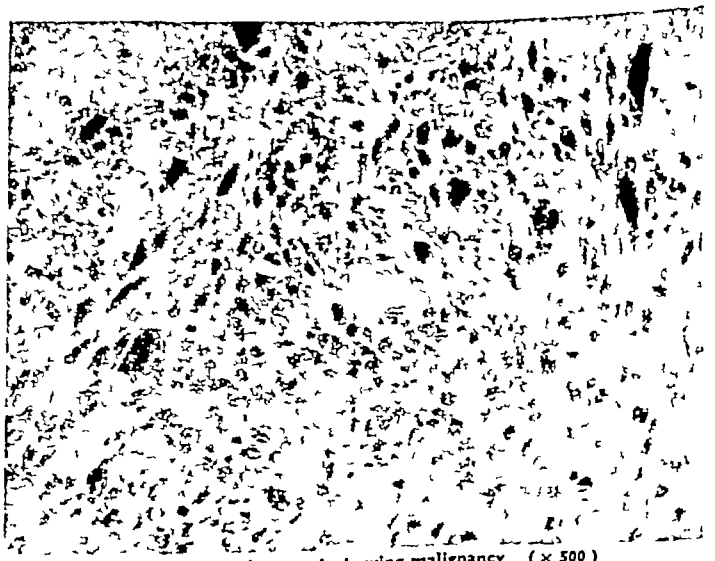

Fig 3—Photomicrograph showing malignancy (× 500)

for this being previous thrombosis of the femoral or iliac vein on the non œdematous side with establishment of a collateral circulation, and congenital venous abnormalities

The collateral circulation to the superior vena cava has been well described by Welch (1909) and Keen (1941), the superficial veins concerned being the inferior and superior epigastric, the long thoracic, the superficial circumflex iliac and the external pudendal, and the deep, the azygos, hemiazygos, and lumbar veins There may be also some return via the liver, through the anastomoses between the tributaries of the portal vein and inferior vena cava Engorged superficial veins are not always found at an early stage and may even be absent throughout, a very efficient deep collateral circulation sufficing In the present case they were almost within the normal range up to the time of death In difficult cases abnormal venous channels may be demonstrated by infra red photography and venography (Stowers and Grossman 1946) The enlarged left ascending lumbar vein seen in the venogram in our case may perhaps be the "left inferior vena cava," the embryological counterpart of the normal right inferior vena cava (Keen 1941)

The results of therapeutic ligation of the inferior vena cava are of interest It was probably first performed by Trendelenburg in 1911 in a patient with puerperal sepsis and has been used more often in recent years to prevent repeated pulmonary embolism It is stated by some that the procedure does not cause more than slight disability and this only in a few cases, œdema being absent or transitory and enlarged collateral veins only rarely developing (Wakefield and Mayo 1934) Others, however, have found troublesome œdema more often

The difficulty of diagnosis in many cases of inferior vena caval obstruction is evident when it is considered that it was made during life in only 4 of 18 of Pleasants's cases from the Johns Hopkins Hospital, in 1 of 15 reported from the Mayo Clinic (Judd and Scholl 1924), and in 2 of 10 in another series (Ney 1946)

Certain complications of obstruction of the inferior vena cava may cause death It would be expected that if the renal veins were occluded heavy albuminuria, perhaps hæmaturia, and renal failure would develop and this may happen if the obstruction occurs suddenly, but otherwise albuminuria appears to be uncommon (Welch 1909), and the anastomosis of veins in the renal capsule with tributaries of the azygos usually enables the kidneys to function normally This was shown in rats by Addis and Lew (1939) who tied off the inferior vena cava above the level of the renal veins and found that many of the animals recovered from the uræmia that usually resulted Although in our patient the tumour extended both above and below the entrances of the renal veins albuminuria was never found Extension of the tumour to involve the hepatic veins may lead to a form of Chiari's syndrome, with tender enlargement of the liver, jaundice, ascites, and splenomegaly Hepatic enlargement was noted 2 days before our patient died, and at post mortem there was considerable venous congestion of this organ with centrilobular necrosis, although the tumour did not actually block the hepatic veins Nevertheless uniform red clots were found in them and it is conceivable that death was in fact due to hepatic failure

Leiomyoma is a fairly common tumour being found in the gastro intestinal and genito urinary tracts, and the uterus breast, and skin Leiomyosarcoma, on the other hand, is more rare It has been reported as a primary tumour in the stomach, duodenum (Golden and Stout 1941) uterus, kidney, and mediastinum (Willis 1948) We have studied the published reports and been able to find only one definite

by Puig Sureda et al (1947) in which t arose from the superior left colic vein The o of primary tumours of the inferior vena ca be two in the German literature of the la One of these (Perl 1871) caused complete obs the vein below the hepatic veins, and dis vessel like the tumour in our patient, it wa cally a spindle celled sarcoma but contain muscle fibres, and Virchow seems to have that it could be called a myosarcoma The that of Unruh (1896), an endothelioma

SUMMARY

A case of leiomyosarcoma of the inferior is described The clinical aspects of obstruct vein are discussed Smooth muscle tumours reviewed, with special reference to those origin

Our thanks are due to Dr A H Holmes for and advice, and for permission to publish this ca to Prof A M Boyd We also wish to thank Baker for his advice and criticism, and Dr L Me with Spanish publications We are indebted Davison for fig 2, and Mr F Ward for fig 3

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MELÆNA FROM HETEROTOPIC G MUCOSA IN THE ILEUM

EDRIC WILSON
F R C S
SURGEON, PLYMOUTH, SOUTH DEVON, AND EAST C GENERAL HOSPITALS GROUP

MELÆNA as a symptom of ulceration of gast in Meckel's diverticulum is well known, but h gastric mucosa in the small intestine seems to

Brown and Pemberton (1936) state that sol of the ileum has been noted not infreq examples from necropsy in fifteen years, and cases, the patients being aged 20–60 The symptoms were abdominal pain in the umb and pallor The ulcer was found in the 5–90 cm of the ileum in 9 cases, and midway be duodenum and the cæcum in 1 case Micro they were simple ulcers with or without a te annular constriction Brown and Pemberto similarity in symptoms to cases of bleeding diverticulum but mention no case of gastric m diverticulum associated with a simple ulce ileum

Because of the similarity in symptoms the references to heterotopic gastric mucosa in diverticulum are of interest Hallendorf and (1947) describe ulceration in Meckel's diverticul by heterotopic gastric mucosa Sibley (1944) s Meckel's diverticulum is the most common site topic gastric mucosa, and thinks that the muc intestine becomes progressively more sensitive chloric acid and pepsin the farther it is from the He uses the term 'dyspepsia Meckeli" to de

describe perforation of the ileum opposite a Meckel's diverticulum Matt and Timpone (1940) found that heterotopic mucosa was often present in the neck of the sac and extended into the adjacent ileum, and regard it as a disease of childhood

CASE RECORD

A married woman, aged 46, was admitted under my care on March 3, 1949, having passed a considerable amount of blood per rectum four hours before admission She was previously admitted to a medical ward in 1947 with the history that in 1944 she had undergone hysterectomy for fibroids, for a few months she had had a nagging pain in the lower abdomen, and on two occasions had passed blood per rectum, and on the day of admission she had fainted five times following a sudden urge to defæcate, and passage of a great deal of blood On admission there were no abnormal physical signs in the abdomen, but dark-red blood was present

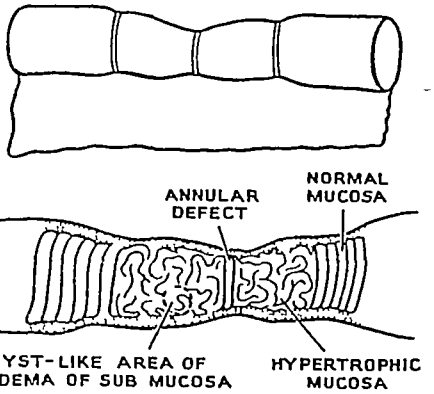

Fig 1—External view of portion of ileum removed
Fig 2—Internal view of portion of ileum removed

in the rectum The hæmoglobin was 55% Palliative treatment was given A fortnight later a sigmoidoscopy showed no abnormality After a month in hospital, in which there was no obvious bleeding but occult blood was found in the stools, she was discharged

On readmission in 1949 she had been having "windy" pains in the lower abdomen for several weeks and passing much wind There was some tenderness over the descending colon with general distension of the abdomen, and shortly after admission she passed another 6 oz of blood She was given enough morphine to keep her sleepy and the bleeding soon ceased

Progress —Three days after admission there was very slight tenderness just to the right of the umbilicus There was no history suggesting peptic ulceration, and the appendix had been removed at the previous operation Hæmorrhage from ulceration in a Meckel's diverticulum was considered probable and, since the bleeding had been recurrent, unexplained and likely to endanger life, exploration was thought advisable

Operation —Laparotomy through a right paramedian incision showed that the appendix had been removed there was no sign of gastric or duodenal ulcer, and no Meckel's diverticulum was found In the ileum, 18 in from the ileo cæcal junction, three constricting rings reduced the diameter to about half the normal (fig 1) the pathology was not clear, but it did not look like regional ileitis Eight inches of ileum was resected and end to end anastomosis performed No other abnormality was found in the abdomen The patient made an uninterrupted recovery, and she remains well

Pathology —The specimen removed at operation was a piece of small intestine 4 in long with mesentery attached It had an hour glass constriction 1 in long, marked externally by three narrow circular whitish bands just visible in the serosa, 1/4 in apart Running transversely across the gut in the middle of the constricted area was an annular groove like defect in the mucosa about 2 mm wide The edges of the defect were regular, and its floor was formed by smooth shiny œdematous submucosa The wall of the gut deep to the defective part was just perceptibly indurated On either side of the groove the mucosa was hypertrophic and presented an irregularly folded pattern quite distinct from the regular ring like folds of normal mucosa At one point 1/4 in away

Fig 3—Mucosa near annular defect. (×30)

from the groove there was a localised cyst-like patch of œdema 1 cm in diameter in the submucosa This could be felt more easily than seen (fig 2) The mucosa over it had split to expose the submucosa, but this was probably an artefact Both the mucosa and the external surface of the gut were of normal colour, and there was no evidence of inflammation or inflammatory ulceration, but the vessels of the serosa in the region of the annular defect were just perceptibly congested The mesentery appeared normal

Histology —The ulcerated area resembled gastric mucosa (fig 3) Mr L W Proger, pathological curator of the Royal College of Surgeons, commented as follows "The section shows undoubted gastric mucous membrane with simple ulceration. These patches of heterotopic gastric mucosa are usually associated with some congenital malformation, such as atresia, reduplication, Meckel's diverticulum, or enteric cyst I have not yet seen one associated with congenital stricture, as in your case"

I am indebted to Dr E Wordley and Dr M R Thomas for their assistance in preparing this article

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PEMPHIGUS ACUTUS TREATED WITH ANTIBIOTICS

THERESA LAZAR
M B Birm, M R C P
MEDICAL REGISTRAR, QUEEN ELIZABETH HOSPITAL, BIRMINGHAM

THE distinction between different forms of pemphigus is not always clear cut Pemphigus acutus, however, is generally regarded as a definite entity (Sutton and Sutton 1939, MacKenna 1945) It occurs mostly in people whose work involves handling animal products, although cases have followed vaccination (Howe 1903) It is probably an infection caught through some breach in continuity of the skin, since many patients give a history of a cut or infective lesion on the fingers A diplococcus was isolated from the lesions by Demme (1886), Claessen (1893), and Bulloch (1895), but this has not satisfied Koch's postulates More recently a virus ætiology has been suggested (Markolf and Knauer 1939) Pemphigus acutus resembles pemphigus vulgaris in many respects, but runs a more rapid course It has a mortality of 50-70% (MacLeod 1933, MacKenna 1945) Hitherto no treatment has been satisfactory.

Since the advent of antibiotics penicillin has been tried in various forms of pemphigus without success (Kolmer 1947, Florey et al 1949, Spink and Hall 1945), but I have been unable to find any specific reference to its use in pemphigus acutus

Recent encouraging reports by Philip (1949), Bettley (1950), and Whittle (1950) on the use of Aureomycin

in pemphigus vulgaris have prompted the trial of this drug in the case described here

CASE RECORD

A man, aged 45, was admitted to the Queen Elizabeth Hospital under Prof K. D Wilkinson on Jan 24, 1950 He was employed in driving a butcher's lorry and handling hides and skins In early December 1949, a whitlow appeared on his left forefinger and persisted until admission. Otherwise he was well until Jan. 16, when he developed coryza with cough, malaise and "pimples" on his face In the next two days blisters appeared all over his body. Later, his eyes began to discharge, and his throat became sore and his voice husky

On admission the patient was very ill with temperature 100°F and pulse rate 116 per min He had extreme fœtor of the breath and body He was hoarse and had a harsh cough, with large amounts of bloodstained sputum containing brownish yellow sloughs The skin of the trunk, limbs and genitalia was covered with bullæ The fresh bullæ were single blisters 1–2 5 cm in diameter on intact skin. The older ones were confluent, broken, discharging and surrounded by erythematous areas *The lesion was worst in the groins and axillæ, where the whole epidermis seemed to be sloughing* On the scalp there were numerous firm dark scabs, and on the face a few small scabs The conjunctivæ were inflamed and discharging mucopus, the eyelids were ulcerated and covered with scabs The mouth was difficult to examine because of trismus but several large bullæ with irregular margins were seen on the mucosa, particularly on the under surface of the tongue There was a purulent discharge from the glans penis. Fig 1 shows the patient's appearance on admission. In the chest there were scanty clinical signs of bronchitis but radiography showed slight emphysema only No abnormality was found in the heart abdomen, or central nervous system.

Investigations—The urine was normal. The red-cell count and hæmoglobin were normal the white-cell count was 10 600 per c.mm. (polymorphs 62%) A swab from a fresh bulla showed no pus cells or organisms in the smear and no growth on culture No significant organisms were grown from the discharge from the glans Sputum culture yielded *Staph pyogenes* which was insensitive to 0·2 unit but sensitive to 0 8 unit of penicillin per c.cm Wassermann reaction and Kahn test were negative

Treatment and Progress—A course of penicillin 50 000 units intramuscularly three hourly was started on Jan. 24, the day of admission After three days of this the patient s condition was unchanged Aureomycin was given from Jan. 26 in doses of 0·5 g six hourly by mouth Twenty four hours later the patient s general condition appeared very much better, the discharge from his eyes was less and the tempera ture lower (fig 2) Only two small new lesions appeared after the start of aureomycin treatment the last one on Jan 30 by which date there was no fœtor and the skin of the face and eyelids was normal. By Feb 6 the mouth and conjunctivæ

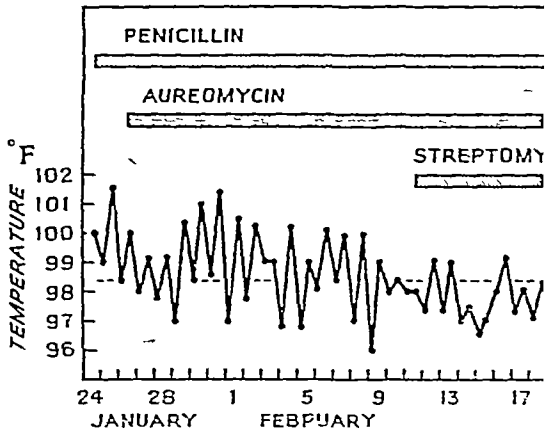

Fig 2—Temperature and treatment chart

were practically clear the voice was much less hoa there was only a slight cough, with scanty white Most of the skin lesions had dried and left scabs flexures and over the pressure points, however, remov bullæ left large denuded areas discharging pus co These were thought to explain the renewed and pe fever A culture from one of these areas yielded a s *Ps pyocyanea* with a low sensitivity to aureomycin (bacteriostatic concentration 50 μg per ml), and s to streptomycin 10 μg per ml This finding led to the a tration from Feb 11 onwards of intramuscular strep 0·5 g six hourly and the local application of strep cream On this treatment the discharge cleared days, the skin was completely healed on Feb 21 cough with sputum remained, but the patient had had this for years He was discharged on March 9

DISCUSSION

The diagnosis of pemphigus acutus in this case in doubt The condition bears some resembla Stevens Johnson syndrome but can be distin by the intense fœtor of the whole body, the larg arising on intact skin and involving the scal absence of the erythematous skin lesions, mer in the mouth, and swelling, ulceration, and blee the lips that are characteristic of Stevens J syndrome

It is probable that antibiotic therapy ma influenced the course of the illness But did drugs act only on the secondary infection, or did both of them affect the disease itself? Strept was started long after the last signs of active pem had disappeared, and it can therefore only have infl the secondary infection Pe did not have any noticeabl while given alone, and fr scientific point of view unfortunate that it was con after the beginning of aure treatment However, the was so gravely ill, with s infected with *Staph py* that it was not thought w *withhold any drug that* help him Although the mycin alone might have with the staphylococci, pe being plentiful could be in more generous doses aureomycin the patient's g condition improved within t four hours, and after eleve the only signs left could be as to secondary infection

No claims can be bas this single case but the

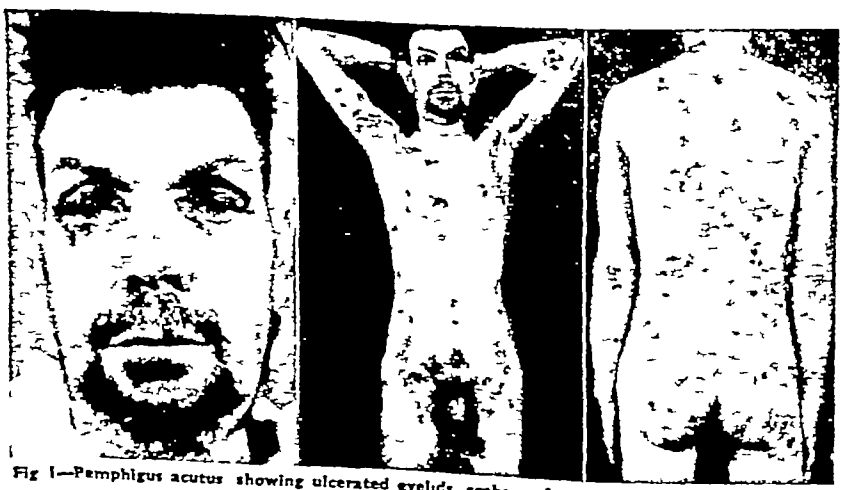
Fig 1—Pemphigus acutus showing ulcerated eyelids scabs on face and distribution of fresh and old bullæ.

seems to justify a trial of aureomycin in other cases of this deadly disease

SUMMARY

A lorry driver, working with hides and skins, developed severe pemphigus acutus, characterised by an erythemato bullous eruption on the skin and mucosæ, and extreme fœtor of the body Penicillin alone was ineffective, but when aureomycin was given as well the patient improved rapidly

I wish to thank Prof K. D Wilkinson for advice and permission to publish the case, and Dr A P Peeney for the bacteriological investigations

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A THERAPEUTIC EXPERIMENT IN PEPTIC ULCER

J B STOLTE
M D Amsterdam
HEAD OF MEDICAL DEPARTMENT,
ST ELISABETH HOSPITAL, TILBURY

IN 1944 a new remedy for peptic ulcer was introduced in Switzerland under the name of 'Robuden' This consists of watery extracts prepared from the wall of the stomach and intestines of newly killed animals and is given by mouth or by injection The idea was not entirely new Okada and Doi (1938) had previously experimented with a similar treatment, though their work has so far not been confirmed, and Sandweiss et al (1939, 1941), and Ivy (1941) had tried enterogastrone, apparently without any lasting success Robuden was found to be effective in experiments by Roulet (1945) on guineapigs and by Grandjean (1948) on rats, and clinical reports on its use in peptic ulcer, mostly favourable, have been published by Schmaszmann (1944), Keiser (1945), Pulver and Maier (1946), Neumann (1946, 1948), Kapp (1946), Hubacher (1946), Bellomo and Bologna (1947), Surkes (1947), Beer (1948), Bergamasco and Morelli (1948), Frémeisz and Roka (1948), Holy and Jelinek (1947), and Ackermann (1948)

In the last few years the treatment has acquired a considerable following in Switzerland and elsewhere, largely because of the good results reported in ambulant patients—an attractive point in view of the shortage of hospital beds

METHOD OF INVESTIGATION

A generous amount of robuden was supplied for trials by the Robapharm Laboratoriums A G There are two kinds of robuden injections, one for gastric and one for duodenal ulcer Besides the injections, tablets are given which are the same for both kinds of ulcer To decide on the respective effectiveness of the injections and the tablets we gave them separately (contrary to the manufacturers' directions) as follows

On 10 consecutive days 1 ml was given intramuscularly, followed by 5 doses of 1 ml a day on alternate days After the 15th injection a change was made to the tablets, of which the patient took one before meals three times a day for 4 weeks, then one twice a day for 2 weeks, and then one three times a day for the first 10 days of each of the next 3 months

The patients were radiographed before the treatment started, after the last injection, and again 6 weeks or 3 months later During the course of injections the symptoms were investigated, and the patients were weighed and, if necessary, examined physically They were encouraged to keep at work and to eat normal meals Smoking was not forbidden

The total number of ampoules and tablets necessary for a complete course were put together in a numbered package An equal number of placebo courses were put up, consisting of brown ampoules containing physiological saline solution and tablets made of talcum with milk sugar, coated like the robuden tablets Only one person prepared the packages and knew the numbering Neither the patient nor the person who gave the injections and tablets in the clinic knew whether the real or the placebo course was being given The numbered packages were given out consecutively, and the numbering was decided by drawing lots Patients with a duodenal ulcer were given injections for duodenal ulcer or placebo, those with gastric ulcer got injections for gastric ulcer or the placebo

RESULTS

Robuden

The results are shown in the table Of the patients with duodenal ulcer 93% were symptom free or greatly improved after the injections, and 70% after the tablets For the patients with gastric ulcer the corresponding figures were 78% and 60%, and for duodenal and gastric groups together 86% and 66%

Since no diet had been prescribed, and most patients had kept at work, these are undoubtedly good results, and they were confirmed by radiography Of the 23 patients with gastric ulcer, 20 showed a considerably smaller niche or none at all after the course In many cases the niche could not be demonstrated after 6 weeks Usually the symptoms disappeared much earlier—several patients had none after the 3rd or 4th injection, and most were practically symptom free after the 8th injection

Placebo

The results of the placebo courses (see table) were no less interesting Of the patients with duodenal ulcer

RESULTS IN PEPTIC ULCER WITH INJECTIONS OR TABLETS OF ROBUDEN AND WITH CONTROL COURSES OF PLACEBOS

Type of ulcer	No of cases	Symptom free		Much improved		Poor result		Radiological changes in niche		
		Inj	Tabs	Inj	Tabs	Inj	Tabs	Disappeared	Much smaller	Little changed
ROBUDEN										
Gastric	23	9	7	9	7	5	9	11	9	3
Duodenal	26	9	9	15	9	2	8			
Total	49	18	16	24	16	7	17	11	9	3
PLACEBOS										
Gastric	24	9	14	10	6	5	4	13	8	7
Duodenal	28	11	11	11	8	6	9			
Total	52	20	25	21	14	11	13	13	8	3

78% were symptom free or greatly improved after the saline injections, and 68% after the tablets For the patients with gastric ulcer the corresponding figures were 78% and 83%, and for both groups together 78% and 75% In contrast with the robuden course, the change from the injections to tablets was not accompanied by any notable reduction in the percentage of good results

One of these patients, successfully treated with the placebo course, ordered genuine robuden tablets from a chemist for a relapse but had no benefit from them Having detected, by biting them a difference between the genuine tablets and those he had taken before, he asked for the placebo tablets After taking these for three days he again became free from symptoms

The effectiveness of the placebo course was confirmed by radiography in the patients with gastric ulcer in 21 of the 24 patients the niche was much smaller or had entirely disappeared The time for healing was exactly the same as with robuden therapy, and the symptoms disappeared in the same time

COMMENT

The effectiveness of placebos in peptic ulcer is not unknown Good results with placebo injections have been described by Sandweiss (1936) and Martin (19 and Gill (1947) obtained successful results in 20 patie treated exclusively with injections of distilled water

The conclusion to be drawn is that any treatment exacerbations of peptic ulcer has a chance of succ In this respect robuden does not seem to be more effect than a placebo

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Reviews of Books

Biological Standardisation

(2nd ed) J H. BURN, professor of pharmacology in the University of Oxford, D J FINNEY, lecturer in the design and analysis of scientific experiment in the University of Oxford, L G GOODWIN, member of the staff of the Wellcome Laboratories of Tropical Medicine London Oxford University Press 1950 Pp 440 35*s*

THIS book is really the second edition of that written under the same title by Professor Burn alone some twelve years ago The statistical analysis of results has been fully treated by Dr Finney, and the part on chemotherapy has been dealt with by Mr Goodwin

Emphasis is laid throughout on the absolute necessity of having standard preparations which are tested simultaneously with the substance being assayed and which, being available to all laboratories make it reasonably certain that a result obtained in one laboratory will, within the limits of experi mental error be equal to that obtained in another There are now 39 International Standards for assaying the potency of preparations of different biological activities It is a pity that no mention could be made of the new International Standard for vitamin D (crystalline vitamin D_3) which was adopted presumably between the writing of the chapter on vitamin D and the actual publication of the book Nor is any mention made of the pioneer work of the British Standards Institution with a preparation of crystalline vitamin D_3, or of Kon s work on the assay of vitamin D in cod liver oils intended for chick feeding Headings and subheadings in the chapter on vitamin D, as in some other chapters are at the first reading confusing Many of the methods of assay are treated historically but it is not always made clear which is the most recently accepted method. In the statis tical section, the historical method is useful for it affords grounds for instructive criticism of the early methods of design and analysis and also reasons for the adoption of new ones

The book will be invaluable to all workers on biological assay Others who wish to know something of what biological assay means, without themselves carrying out experiments, will find it understandable and interestingly written It is not merely a laboratory handbook but also a valuable treatise.

Le rétrécissement mitral

R LUTEMBACHER Paris Masson. 1950 Pp 304 Fr 1400

THIS account of mitral stenosis is written from the French point of view, and the English speaking reader will find that this differs from his own in many important particulars As a cause of the condition syphilis is considered almost as important as rheumatic fe and, in those cases regarded as rheumatic, salicylat credited with the power to relieve myocarditis Tho there is now a movement here to establish high blo levels of salicylate in acute rheumatism, few would ad that—even when given intravenously over a long per as recommended—it can have so beneficent an effect the myocardium as Lutembacher contends An inter ing description of the mechanism and closure of the mi valve is given, and a good deal of attention is paid to apical systolic murmur, but the way in which the mi diastolic murmur evolves receives relatively li attention, and the extra sound heard in diastole at apex is made unnecessarily mysterious The prob of mitral stenosis and pregnancy is only briefly describ and the emphasis placed on relative rarities, as compa with the commonplace, may be illustrated by the f that auricular tachycardia receives a page or two wl auricular fibrillation is dismissed in three lines Th seems to be no mention of mercury diuresis in the tre ment of congestive failure, while for acute pulmon œdema the impression given is that morphine is of m or less the same value as infiltration of the stell ganglion

The British cardiologist will find much that is unacce able in this book, but at the same time much to refl on with profit Many case reports are included and th are excellent photographs of valve lesions

Principles of Ophthalmology

THOMSON HENDERSON, M D, senior surgeon, Nottingh and Midland Eye Infirmary London Hemema Medical Books 1950 Pp 230 20*s*

FROM his researches into the structure of t mammalian globe and his clinical investigations of t human eye, Mr Henderson chooses three points at wh he differs from current teaching—the angle of t anterior chamber, the mechanism of accommodati and the intra ocular pressure He gives reasons believing that the aqueous humour has access to t suprachoroidal space and that by this means particul matter is absorbed from the anterior chamber M important, he thinks, is that this gives the retina a choroid a cushion and thus prevents their being damag by compression against the sclera (He does not expl adequately why aqueous does not escape when t space is exposed at operation) He disagrees with t view that in accommodation the choroid moves sligh forward, while he also regards the statement that t intra-ocular pressure is normally about 25 mm as erroneous, he believes that the intra ocular pressu like the intracranial, is about 10 mm

The author has given a great deal of thought to statements, which are challenging and of great intere

They deserve to be read by ophthalmologists everywhere, and no doubt contain a deal of truth But he could have made his points equally well without referring to the "incomprehensible inanity" encountered in textbooks It may even be that some of his own statements are not free from such a charge

The Springs of Conduct

SIR JOHN PARSONS, C B E, F R C S, F R S London J & A. Churchill 1950 Pp 104 7s 6d

IT is a privilege to overhear a great man Sir John Parsons covers in this book a range of material from neurology and the phylogeny of the nervous system to anthropology and the philosophy of mind—matter for many dozens of books—and does so with clarity and insight His masters are McDougall, Whitehead, Trotter, and above all Sherrington The philosophy of mind has, with the passage of time, moved beyond these writers, but they have left their impress on it and bear frequent revisiting The only blemish, to the reader, is in an occasional looseness of phrase—"the bird is a species which has produced many varieties," "abnormal psychosis," and the like—which is worrying but not a serious bar to comprehension

Eye Surgery

(2nd ed) H B STALLARD, M B E, M D Camb, F R C S, surgeon, Moorfields Eye Hospital, eye surgeon, St Bartholomew s Hospital Bristol John Wright & Sons 1950 Pp 683 52s 6d

THE first edition of this book, coming at the end of the late war, contained a disproportionate amount of military surgery, nearly a third of it being on this subject The author has now corrected this lack of balance Besides 212 new illustrations, there is much new text, including particulars of the latest methods of treating retinal glioma, in which he has had a particularly large experience, and of some new plastic operations The revised volume is a detailed account of the operations in common ophthalmic use, lucidly described and for the most part well illustrated Possibly in places it is a shade fussy Some surgeons may not like to be told to tie surgeon's knots where stability is required, or the precise amount of procaine injected for a particular purpose Perhaps the operation of advancement of the external rectus almost to the limbus should no longer find a place in such a book, and some pictures of enucleation of the eye would be a useful addition. But this is an outstanding work.

Syphilis Its Course and Management

EVAN W THOMAS, M D, professor of clinical medicine, New York University College of Medicine New York and London Macmillan 1949 Pp 317 42s

Dr Thomas is one of the leading American authorities on syphilis and has played an important part in investigating the use of penicillin in its treatment This book is not meant to be a complete textbook on the disease, its object is rather to present the life-history and to outline principles and methods of treatment

The brief chapter on immunology is particularly clear and helpful the section on serological tests and their interpretation and the clear exposition of therapeutic principles and up to date technical detail are all excellent In conformity with American ideas and experience, penicillin is taken to be the drug of choice in all stages of syphilis, and the older remedies receive no more than summary mention Dr Thomas is never content to rest upon the statements of others but gives facts and figures from the large and well studied material of the Bellevue Hospital

Having disclaimed any intention of writing a full clinical description of the various stages of the disease it is perhaps a pity that the author attempted to describe them for this aspect of the subject is dealt with so sketchily as to be possibly misleading Some brief excursions into pathology are equally unhappy For instance the suggestion that gummatous ulcers of the skin usually arise from gummata which commence in the skin itself is inaccurate and liable to be confusing, and, in this country at least, it is not true that the commonest tertiary syphilitic lesion of the tongue is a localised gumma In discussing the toxic effects of arsenical drugs Dr Thomas takes no account of the evidence that most cases of post-arsphenamine jaundice are due to an infection, probably identical with the one that causes homologous serum jaundice.

For the expert and for the postgraduate student this will be a valuable supplement to standard works, but for the undergraduate it is unsuitable The final chapter is a useful review of the public health aspects of syphilis by Dr Theodore Bauer, of the United States Public Health Service The index is good and helpful, the bibliography is carefully compiled

The Chicago Cook-County Health Survey

Conducted by the United States Public Health Service Director K E MILLER, M D New York Columbia University Press London Oxford University Press 1949 Pp 1317 120s

THIS is a comprehensive survey of facilities for maintaining and furthering the health of Chicago and its surrounding districts, with a full discussion of their merits and demerits and possible improvement Undertaken by the Federal health service on the request of the mayor of Chicago and the president of the Board of Commissioners of Cook County, it is probably the most complete of its kind ever made anywhere The report should be available in reference libraries to be used as a model in comparable inquiries The results of similar surveys in this country would have been of great value in framing the National Health Service Act

Urological Roentgenology (3rd ed London Henry Kimpton 1950 Pp 282 52s 6d)—Dr Miley Wasson s treatise with nearly 300 well produced radiographs remains supreme in its field

Freeze-drying Drying by Sublimation (New York Reinhold Publishing Corporation 1949 Pp 280 40s)—This book, by Earl W Flosdorf, describes the development of freeze drying, and the physical data essential for the successful use of small scale and large scale apparatus, and gives details for the freeze drying of widely different products—from penicillin to carrots—with many valuable cautionary notes A useful chapter deals with the use of acrylic plastics for the embedding of anatomical and pathological specimens

Physiology of the Nervous System (3rd ed New York and London Oxford University Press 1949 Pp 667 75s)—It is six years since the second edition of Prof J F Fulton's Neurophysiology appeared In that time the main direction of advance has been in our knowledge of the methods of activity of the cerebral hemispheres It is particularly in this regard that the text of this edition has been revised and brought up to date Such things as the suppressor areas of the cerebral cortex, the autonomic responses to stimulation of the orbital surface of the frontal lobes, and details of localisation of functions in the cerebellar hemispheres are all new and are all described here Chapters such as those on the thalamus, the temporal lobes, and the precentral motor cortex also provide topical summaries which will be helpful to the busy reader who has difficulty in keeping abreast with rapidly changing views Professor Fulton's bibliography runs into 80 pages, but it is critically compiled Most doctors particularly concerned with the activity of the nervous system have used this readable and well presented book, and will continue to do so

Combined Textbook of Obstetrics and Gynæcology (5th ed Edinburgh E & S Livingstone 1950 Pp 1411 70s)—Edited by Prof Dugald Baird, this well known text book has been enlarged by the addition of new chapters dealing with stillbirth, infant mortality, and the psychological factors in obstetrics and gynæcology, and more space has been given to the practical details of treatment Emphasis is laid throughout on the preventive and physiological approach rather than on the operative side In the section on obstetrics the breast pump is still advocated for the treatment of the engorged breast, and the diagnosis and treatment of the various forms of thrombosis are very scantily dealt with, without any description of anticoagulant therapy or the use of local anæsthesia But such grounds for criticism are few and Professor Baird and his co authors must be congratulated on producing an excellent textbook which will not only be of great value in training medical students but will help the doctor to obtain a broader outlook in the field of obstetrics and gynæcology The production, too, is excellent

THE LANCET

LONDON SATURDAY, DEC 23, 1950

Priorities

NOBODY can read the exultant reviews of medical progress over recent decades without asking "Where is all this leading?" With its scientific, economic, political, and philosophical implications, the question is so comprehensive that, rather than attempt an answer, most of us turn back to our immediate work But within the larger question some narrower ones continually force themselves upon us One of these is "Should our efforts be mainly directed to getting patients into hospital or to keeping them out of it?" Dr HUGH PAUL raises this again in his stimulating report as M.O.H for Smethwick He remarks that when a specialist proposes a scheme for improving work in his specialty—for instance, neurosurgery—the questions asked by the regional board are "What is the extent of the demand for this service?" and "What is the most economical way in which these demands can be met?" This, Dr PAUL says, is wrong The first question should be "In what way can these demands be met without the provision of hospital beds? How can the number of patients suffering from neurosurgical conditions be reduced?" (The choice of neurosurgery for the example is not perhaps particularly happy, but the point is clear enough) The reasons why hospital authorities do not approach the subject in this way are "firstly, they are not particularly interested in problems which they have never studied, and which they have never regarded as within their competence, and secondly, with one exception, no regional hospital board in this country has amongst its members a professional epidemiologist" The boards are also hampered in other ways by their make up The business men who serve on them, and who previously served on the voluntary hospitals, are accustomed to judge the relative importance of things by financial criteria and now find their standards inapplicable The hospital is not run for profit, and such a man may have no other values to take the place of the financial ones

> "Unlike the local authority member, he is not an expert in social values, and consequently can only interpret hospital efficiency in terms of the cost and size of equipment, the extent of the chromium and marble, and the appearance of the buildings If the hospital has a larger X ray or a larger pathological department, or spends more on the kitchen equipment than another hospital, he is apt to assume that his hospital is better run than the others This unfortunately does not follow"

Dr PAUL carries his argument further—perhaps too far—when he urges that the local authority representative, on the contrary, is "usually a man or woman who for many years has been accustomed to deal almost entirely in social values" previous experience has led him to make such abstract comparisons as that between, for example, a new picture in an art gallery and the redecoration of the law-courts, or a new boiler at the sewage farm It is of course, true that local ...

to decide such questions, but many would be r
to follow Dr PAUL in his conclusion that "i
appear that the ideal board is one composed
if not entirely, of members from major local
ties" There are, after all, other alternativ
one of them is to be found in a better underst
throughout the hospital service, from the Mi
the members of the hospital management con
of the part to be played by the hospital

The trouble is surely not so much that
member of the hospital board is unduly im
by the magnificence of modern apparatus as
have inherited from the past a belief that a
is progressing if it is growing larger and large
more than a hundred years known medical n
so far outstripped resources that, with a few exc
not much in the public eye, progress has been m
by the extent to which the hospital servic
grow in its effort to catch up Any of the older
literature would prove this What was true
individual hospital has come to be held to
of most hospitals, and now by a loose transfe
ideas to the hospital service as a whole W
not even developed the data which would en
to compare, over the years, the purposes to
hospital beds are put, though it is obvious th
have been radical changes of user The result
"Halt" has been called at an arbitrary point
Exchequer rather than by a rational inference
within the health service as a whole

A few minds have been troubled by the impl
of such data as have been available There a
here and there in FLORENCE NIGHTINGALE'S w
By her study of statistics she drove home the
of the Crimean hospitals, and passed on to t
ventable mortality in the Army at home and
work for the health of the British soldier
DAWSON, though caught up in the tide of the Kn
progress at the London Hospital, later becan
vinced of the urgency of pairing the curativ
the preventive services, and of not regardi
hospitals as in any sense an exception to this pr
The theme ran through the Dawson report of
but it remained a generalisation Nobody
able to see how it could be brought down to
and made a reality That the hospital should
itself in positive health?—that there should
clinic for the "healthy" as well as for the "i
there was something unconvincing in such sugge
however well intentioned Was the medical of
health to be brought in and given a seat
hospital board? Sometimes that was tried
though it usually proved useful, it led to no
change of outlook on the part of the hospital
pitals did not start handing over money for
hospital services however demonstrable the nee

That is in fact where we stand today As a
of administrative convenience the health s
have had to be parcelled out under the N
Health Service Act into parts I, II and III, but,
a great deal of new machinery has been crea
has not been established that the Minister, in allo
total resources, should be guided by a profe
body backed with the necessary data The pr
between various parts of the service are still

by pressure from the different quarters, though the pressure is filtered by the Minister's staff of professional advisers Is it not ultimately desirable that these top priorities should be discussed publicly, well in advance of the date when they must come into operation, by some such body as the Central Health Services Council? And that this body should be given a real opportunity of assessing, if not the amounts, at any rate the proportions in which the whole sum should be distributed? The change of principle involved in admitting such a body to participation in financial discussions would be so great as to make it unreasonable to press for more than the opportunity to discuss and to recommend at any rate for some years to come the Minister would have to retain the ultimate responsibility But the very preparation of the data for such consideration would at once involve the Ministry in a range of most desirable inquiries into the relative claims of this and that on the public purse

We must add that in all such thinking and reasoning there lurks a danger From discussing the relative claims of this or that form of curative or preventive medicine it is but a short step to talking in terms of value to the community and thence to a crude utilitarianism which will prefer the interests of the workers to those of the aged, and the useful to the apparently useless Even PLATO argued himself into this perverse position As POPPER[2] has reminded us, PLATO was led to interpret medicine as a form of politics "the physician has no right to treat a man who cannot carry out his ordinary duties, for such a man is useless to himself and the State" The advocates of preventive medicine sometimes lapse into this risky doctrine, which is anathema to the doctor in the hospital as it is in the home In a later section of his report Dr PAUL, like so many of us, begins to sail near the wind when he writes that it could "scarcely be denied that looking at the matter coldly, it is a business proposition to keep the people healthy rather than to allow them to become ill and then endeavour to cure them by the spectacular activity of a glamorous profession" It is surely a matter of some urgency that the danger-point at which good sense passes over into something very different should be more precisely defined Perhaps those who are going to be our advisers on these matters should be required to include in their curriculum some knowledge of the Benthamite philosophy, and of the deep distrust of it felt by philosophers today, so that they may see clearly to what lengths they might easily be led

The Last Disability

IT would be inconvenient if our tastes remained unchanged through life In *Vice Versa* the mature man, turned boy again, quails before a slab of suet pudding, and who, in his fifties, lightly rises to go rowing on an icy river before breakfast? But if life breaks us in kindly, in the main, to the waning of our early powers, there must always be cases where some special loss is hard to bear Those who have led an active life are often much oppressed by the limitations of the ageing body Our contributor writing on the disabilities of old age (p 872) chafes at his enforced inactivity, and must fight the restlessness it breeds in him What, he asks, should, for the old, take the place of physical recreation? Women feel the force of this question less than men, for their "activity" is usually of a different order Where an elderly man may still be playing such games as golf and bowls, or may enjoy walking or climbing in the open until late in life, an elderly woman is usually active about the house, and she can carry on with familiar household chores long after the man has been obliged to restrict his outdoor pursuits Moreover, women are accustomed to using their hand muscles as freely as their limb muscles, and when walking becomes difficult they take cheerfully to hand-work as a substitute for leg work. A ward for old women is nearly always a more active and lively place than a ward for old men, because all the women are commonly engaged in making something, especially if they are encouraged by the nurses. It is much harder to get old men to value minor handicrafts Yet, after all, physical recreation is very largely an opportunity to use muscles skilfully, to compete, and perhaps to excel When the great muscles begin to fail, the small muscles can give the same satisfactions on a miniature scale

Dr HOWARD COLLIER and MISS EVELYN STURGE, who have given some thought to the problem of growing old, suggest in a recent pamphlet[1] that old people are "the guests of the next generation," and like other guests they themselves help to determine the kind of welcome they receive They can still do much for others, not only by such small services as are in their compass, but by their contented silence, their refreshing memories, their easy company It is the part of age, these writers suggest, to withdraw into the background, but to do it in a way that makes nobody feel guilty The old can keep up their interests by reading, and should be ready to talk on what they have read, little perhaps but well An informed old person can, they think, sometimes waken an interest in poetry or biography in a younger member of the family Since personal possessions become more of a burden with age, old people should gradually get rid of their belongings, keeping only those they specially prize Writing from a religious standpoint, Dr COLLIER and MISS STURGE add much to mitigate the fear not only of death but of war and other disasters

This pamphlet is addressed chiefly to people of some education, who may expect to grow old in their own homes, or the homes of their children or relatives Their physical needs will be well looked after In the community, however, we have many solitary old people of small means who in the past inevitably gravitated to the chronic wards of institutions, and still do so in areas where the care of the old is not yet fully organised Most such old people dread falling sick because removal to hospital may mean final and complete loss of their homes, and for the same reason hospitals are loth to accept them, for an old person with no home to go to must be allowed to occupy a bed till he dies But then as SIR ANDREW DAVIDSON lately put it,[2] a hospital is the last line of

2 Popper K R The Open Society and its Enemies 1945 vol i p 121

1 The Glory of Growing Old Friends Bookshop Euston Road London, N W 1 Pp 27 6d

2 Address by Sir Andrew Davidson chief medical officer of the Department of Health for Scotland at the opening of an old people's home at Balnagask Aberdeen on Dec 6

efence Many, given some necessary help, can live n and keep well in their own homes, others do well i hostels or homes for old people Some can go into ospital for treatment of an acute illness or a chronic isability and return to their homes able to carry n again, provided they can be helped with their ousework, shopping, and cooking Moreover, these inds of help are less costly than hospital care Sir ANDREW quoted the estimate of a medical officer f health that the total cost of caring for an elderly erson in his or her home—including old-age pension, ational assistance, and local authority services uch as home help, district nurse, and health visitor —amounts to only about £98 yearly, or under £2 a week A more elaborate scheme, including meals on wheels, a laundry service for those who specially need it, and the services of a chiropodist, would work out at £123 a year or nearly £2 10*s* a week Care in a hostel costs £3 10*s* a week, and care in hospital anything from £8 a week upwards He made it clear that the chief need of old people is not increased medical care something like half of them, as surveys show, do not see a doctor from one year's end to the next, only about a fifth of them need frequent medical attention, though about the same proportion require regular visits from the district nurse What they chiefly need is help with the heavier household jobs, relief from queueing, a cooked meal now and then, help with letter-writing, or simply a little company Voluntary visitors who call on old people once a week can be very welcome, especially to those who cannot get about easily, but the more active old people of sociable disposition get great pleasure from old people's clubs Sir ANDREW said that of every 100 people of pensionable age something like 25 need help of some kind In any case some 95% of old people, he thinks, can get along in their own homes if those who need it are helped, and this is "a wide field of endeavour for local authorities and voluntary bodies working in close harmony"

It is appropriate perhaps that old age should be the subject of the last essay in our "Disabilities" series, though it is debatable whether old age as such should be regarded as a disability at all. The old today are many and increasing, and it becomes the task of the rest of us not only to treat and ease the disabilities of age, but also to give the old the chance to contribute their share to our common life Like all the others who have written in this series, the writer of this last article makes it clear that a disability is something a man or woman carries it is no more a part of him than his overcoat, and it has nothing to do with the capacities of the human spirit except to evoke them

Gastric Biopsy in the Pernicious-anæmia Syndrome

ATROPHIC gastric mucosa in pernicious anæmia was described eighty years ago by SAMUEL FENWICK, but, because post-mortem changes set in so soon, histological studies have seldom been satisfactory MAGNUS and UNGLEY [1] did obtain proper tissue, by adopting extraordinary measures, but these could not be repeated often, and nowadays necropsies on patients with pernicious anæmia in relapse are rare MAGNUS and UNGLEY found that in the fundus and body of the stomach the normal mucosa was replaced by an intestinal type of mucosa with relatively shallow glands, the pyloric portion of the stomach was relatively normal Their findings were confirmed by COX,[2] who pointed out that the changes were unlike those of chronic gastritis, and also that the gastric changes persisted however long the disease had been present

The idea of obtaining specimens of stomach during life came with the development of gastroscopes, and operating gastroscopes fitted with biopsy forceps have been described The use of such instruments requires much skill by the operator and causes no little discomfort to the patient Last year an Australian group [3] described a flexible gastric-biopsy tube that was small, could be passed easily and quickly, and produced a fragment of gastric mucosa large enough for reasonable histological sections to be prepared The method had the disadvantage that, without radiological control, it had to be used blind With this instrument nearly 500 biopsies have now been performed, and in only 5 was there bleeding afterwards sufficient to cause hæmatemesis or melæna Among the 33 cases of pernicious anæmia in this series they found [4] much the same state of affairs as had their predecessors The gastric mucosa is atrophic and of less than half the average depth, the gastric glands are almost completely atrophied, and a special stain shows very few cells with pepsinogen granules The intestinal metaplasia noted by MAGNUS [5] is common but not constant Some infiltration with lymphocytes is present but is never dense In chronic gastritis, cellular infiltration of the mucosa is dense, and polymorphs and plasma cells are present as well as lymphocytes, moreover, intestinal metaplasia is rare and residual clumps of pepsinogen cells are common Some other interesting results have been obtained For instance, JACOBSON [6] had stated that argentaffine cells were absent in the mucosa of patients with pernicious anæmia who had not had liver treatment, and he suggested [7] that the granules seen in argentaffine cells in normal mucosa contained a pterin substance, and this observation became specially interesting when it was found that folic acid is a pterin substance However, in the gastric biopsy specimens argentaffine cells could be easily demonstrated Another important point was that the gastric atrophy seemed permanent, and even after many years of proper treatment it showed no change

DOIG and WOOD suggested that their gastric biopsy technique could be usefully applied to the kind of case that has become the bane of medical outpatient departments—this is the patient who is thought by his doctor to be "anæmic," and so, without any blood examination, is given some blunderbuss preparation containing ineffective doses of liver, folic acid, iron, and probably "vitamins" The patient does not respond as expected, so he is sent to hospital for diagnosis, by then the blood picture will not be typical, and the bone marrow will be difficult to interpret A gastric biopsy revealing typical atrophy

1 Magnus H A Ungley, C C *Lancet* 1938 i 420

2 Cox A J *Amer J Path* 1943 19 491
3 Wood I J Doig R K Motteram R Hughes A. *Lancet* 1949, i 18
4 Doig R K. Wood I J *Med J Aust* Oct. 14 1950 p 565
5 Magnus H A *J Path Bact* 1937 44 389
6 Jacobson W *Ibid* 1939, 49, 1
7 Jacobson W *Biochem J* 1946 40 3

by pressure from the different quarters, though the pressure is filtered by the Minister's staff of professional advisers Is it not ultimately desirable that these top priorities should be discussed publicly, well in advance of the date when they must come into operation, by some such body as the Central Health Services Council? And that this body should be given a real opportunity of assessing, if not the amounts, at any rate the proportions in which the whole sum should be distributed? The change of principle involved in admitting such a body to participation in financial discussions would be so great as to make it unreasonable to press for more than the opportunity to discuss and to recommend at any rate for some years to come the Minister would have to retain the ultimate responsibility But the very preparation of the data for such consideration would at once involve the Ministry in a range of most desirable inquiries into the relative claims of this and that on the public purse

We must add that in all such thinking and reasoning there lurks a danger From discussing the relative claims of this or that form of curative or preventive medicine it is but a short step to talking in terms of value to the community and thence to a crude utilitarianism which will prefer the interests of the workers to those of the aged, and the useful to the apparently useless Even PLATO argued himself into this perverse position As POPPER[2] has reminded us, PLATO was led to interpret medicine as a form of politics "the physician has no right to treat a man who cannot carry out his ordinary duties, for such a man is useless to himself and the State" The advocates of preventive medicine sometimes lapse into this risky doctrine, which is anathema to the doctor in the hospital as it is in the home In a later section of his report Dr PAUL, like so many of us, begins to sail near the wind when he writes that it could "scarcely be denied that looking at the matter coldly, it is a business proposition to keep the people healthy rather than to allow them to become ill and then endeavour to cure them by the spectacular activity of a glamorous profession" It is surely a matter of some urgency that the danger-point at which good sense passes over into something very different should be more precisely defined Perhaps those who are going to be our advisers on these matters should be required to include in their curriculum some knowledge of the Benthamite philosophy, and of the deep distrust of it felt by philosophers today, so that they may see clearly to what lengths they might easily be led

The Last Disability

IT would be inconvenient if our tastes remained unchanged through life In *Vice Versa* the mature man, turned boy again, quails before a slab of suet pudding, and who, in his fifties, lightly rises to go rowing on an icy river before breakfast? But if life breaks us in kindly, in the main, to the waning of our early powers, there must always be cases where some special loss is hard to bear Those who have led an active life are often much oppressed by the limitations of the ageing body Our contributor writing on the disabilities of old age (p 872) chafes at his enforced inactivity, and must fight the restlessness it breeds in him What, he asks, should, for the old, take the place of physical recreation? Women feel the force of this question less than men, for their "activity" is usually of a different order Where an elderly man may still be playing such games as golf and bowls, or may enjoy walking or climbing in the open until late in life, an elderly woman is usually active about the house, and she can carry on with familiar household chores long after the man has been obliged to restrict his outdoor pursuits Moreover, women are accustomed to using their hand muscles as freely as their limb muscles, and when walking becomes difficult they take cheerfully to hand work as a substitute for leg work. A ward for old women is nearly always a more active and lively place than a ward for old men, because all the women are commonly engaged in making something, especially if they are encouraged by the nurse It is much harder to get old men to value minor handicrafts Yet, after all, physical recreation is very largely an opportunity to use muscles skilfully, to compete, and perhaps to excel When the great muscles begin to fail, the small muscles can give the same satisfactions on a miniature scale

Dr HOWARD COLLIER and Miss EVELYN STURGE, who have given some thought to the problem of growing old, suggest in a recent pamphlet[1] that old people are "the guests of the next generation," and like other guests they themselves help to determine the kind of welcome they receive They can still do much for others, not only by such small services as are in their compass, but by their contented silence, their refreshing memories, their easy company It is the part of age, these writers suggest, to withdraw into the background, but to do it in a way that makes nobody feel guilty The old can keep up their interests by reading, and should be ready to talk on what they have read, little perhaps but well An informed old person can, they think, sometimes waken an interest in poetry or biography in a younger member of the family Since personal possessions become more of a burden with age, old people should gradually get rid of their belongings, keeping only those they specially prize Writing from a religious standpoint, Dr COLLIER and Miss STURGE add much to mitigate the fear not only of death but of war and other disasters

This pamphlet is addressed chiefly to people of some education, who may expect to grow old in their own homes, or the homes of their children or relatives Their physical needs will be well looked after In the community, however, we have many solitary old people of small means who in the past inevitably gravitated to the chronic wards of institutions, and still do so in areas where the care of the old is not yet fully organised Most such old people dread falling sick because removal to hospital may mean final and complete loss of their homes, and for the same reason hospitals are loth to accept them, for an old person with no home to go to must be allowed to occupy a bed till he dies But then, as Sir ANDREW DAVIDSON lately put it,[2] a hospital is the last line of

2 Popper K R The Open Society and its Enemies 1945 vol I p 121

1 The Glory of Growing Old Friends Bookshop Euston Road, London N W 1 Pp 27 6d

2 Address by Sir Andrew Davidson chief medical officer of the Department of Health for Scotland at the opening of an old people s home at Balnagask Aberdeen on Dec 6

in damp refuse In the country it is harder, of course, to abolish breeding places, but with common sense and residual insecticides the problem is not insoluble Those asked for advice on the subject can do no better than recommend a recent publication designed for the lay man by the Ross Institute [1], this emphasises general principles of fly destruction, avoiding that excessive dogmatism which leads to disappointment

We should all, no doubt, be keener on destroying flies if there were stronger evidence that they play an important part in the spread of disease During campaigns in the Near East it has been noted several times that the number of hospital admissions for dysentery varied with the active fly population, and the point of this observation has been sharpened by the finding of species of shigella (and of *Salmonella typhi* and the virus of poliomyelitis) on the feet of flies which have had access to human excreta But we need to know more For example, how many flies abandon the delights of the latrine for the joys of the kitchen, and can one fly carry enough organisms to infect one man? (Tubercle bacilli occur in the mouths of those with phthisis, glasses on licensed premises often receive no cleaning beyond "a lick and a promise" Does the tosspot hence run a much greater risk of infection than the abstainer?) And the danger of an argument based on coincidence is that it may be no more than co incidence, it is possible that the seasons of maximum fly population in the Near East were also those of foulest climate, fungal diseases of the skin, and universal longing to be elsewhere Hope's [2] classical paper on the relation of temperature, flies, and infantile enteritis is convicting evidence only up to a point, for three successive years the disease became prevalent as soon as the fly population reached a certain level, but that this did not occur in the fourth year suggests that the relation was not a simple one of cause and effect

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DRUGS FOR DYSENTERY

IN 50–80% of the cases of bacillary dysentery investigated by the Public Health Laboratory Service in the last few years the organism isolated was *Shigella sonnei* Glover's studies [3] of the notifications in England and Wales have shown that epidemic waves of dysentery, probably of the Sonne type, mainly occur in the autumn and late winter or early spring, and that children under 5 years account for about a third of the dysentery notifications in males but only about a fifth in females Why little boys are much more susceptible than little girls, and what determines the seasonal incidence, is unknown The human alimentary tract is believed to be the chief, if not the only, reservoir of infection, and it is particularly difficult to prevent and control the spread of the Sonne bacillus among children attending day nurseries or nursery schools or among the inmates of children's residential institutions

Since 1945, despite the fluctuating incidence, mortality from bacillary dysentery has steadily declined This association of fluctuating incidence with declining mortality is found also with scarlet fever, and here it has been attributed to the increasing use of the sulphonamides A similar explanation may also account for the falling mortality from bacillary dysentery, against which sulphonamides have been used since 1940 At first the relatively poorly absorbed sulphaguanidine and succinylsulphathiazole were regarded as the drugs of choice, but in 1946 Hardy [4] finally proved that the most readily absorbed sulphonamides, such as sulphadiazine, are the most effective against shigella infections Usually treatment of Sonne dysentery with such sulphonamides is extremely successful, unfortunately, however, application of sulphonamide therapy is not always straightforward Thus in some infants and children who have had severe or long continued diarrhœa before the cause is recognised as shigella infection, the administration of any sulphonamide may be dangerous until dehydration has been corrected, and thus the start of chemotherapy may be delayed for as much as thirty six hours Then occasionally severe acquired hypersensitivity or specific idiosyncrasy to sulphonamides may bar their use Another difficulty, often mentioned but at present perhaps more theoretical than real, is that in the presence of resistant strains sulphonamide therapy may either fail to cure or result in relapse or a chronic carrier state

It now seems that, where sulphonamides cannot be used, chloramphenicol is likely to be the most useful alternative Mazursky,[5] for instance, obtained excellent results with chloramphenicol by mouth in 3 children with Sonne infection, and in a much larger study of 35 cases, 33 of which were due to the Sonne bacillus, Ross and his associates [6] achieved results with this drug that were as good as, or better than, those in controls treated either with sulphadiazine or with streptomycin

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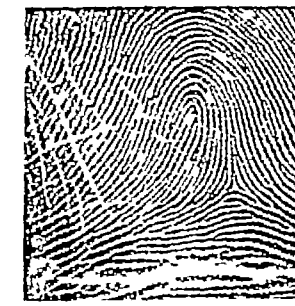

1 The Housefly and its Control Ross Institute Industrial Advisory Committee bulletin no 5 London, 1950
2 Hope E W Liverpool Annual Health Report 1920
3 Glover J A *Mon Bull Min Hlth P H L S* 1949 8 138
4 Hardy A V *Publ Hlth Rep Wash* 1946 61 24
5 Mazursky M M *J Pediat* 1950 37 238
6 Ross S Burke F G Rice E C Washington J A Stevens S *J Amer med Ass* 1950 143 1459
7 Galton, F Finger Prints London 1892
8 Cherrill F R *Nature Lond* 1950 166 581

or intestinal metaplasia would be useful evidence in favour of pernicious anæmia, mucosa that showed the changes of chronic inflammation, or no abnormality at all, would be evidence against pernicious anæmia In this issue the Australian team describe their application of this method, and of these arguments, to the diagnosis of the neurological part of the pernicious anæmia syndrome Here, it must be confessed, they are less convincing Clearly the problem in Australia is somewhat different "In Australia," they say, "there are few conditions which so often escape diagnosis until an irrecoverable stage is reached" One cause of delay in diagnosis is "a reluctance to diagnose subacute combined degeneration of the cord unless there is a well defined picture of pernicious anæmia in the peripheral blood" Again, "cases simulating peripheral neuritis are usually treated uselessly with vitamin B_1 and progress until the diagnosis of subacute combined degeneration becomes obvious" These statements would not often apply in this country The impression is strengthened by the records of the patients described, our feeling is that, sent to a clinic where such refinements as gastric biopsy were available, they would have been satisfactorily diagnosed and treated without recourse to gastric biopsy This is not to say that a problem does not exist—it does The problem patient is one, of suitable age, who complains of persistent paræsthesiæ in the distal parts of the limbs, and shows organic impairment of vibration and joint sense, motor changes have not yet appeared, no anæmia is present, and the bone marrow is reported as normal, but achlorhydria is found What would happen if gastric biopsies were done on such patients, and if those who had mucosal changes like those described in pernicious anæmia were treated with proper doses of liver or desiccated stomach? Would the paræsthesiæ disappear and would the syndrome be arrested? DOIG and his associates offer no evidence on this crucial point, they may have to wait awhile before producing it, because the patients must be watched for years rather than months

It is well known that the patient with subacute combined degeneration of the cord whose outlook for recovery is worst is the one who is *not* anæmic The reward for early diagnosis, if in fact treatment will prevent extension, is consequently very great The difficulties of making a diagnosis that has to rest on the appreciation of mild, often mainly subjective, neurological changes, at an age when symptoms like dysæsthesiæ may be due to several causes, are properly emphasised by the Australian workers The value of gastric biopsy depends a good deal on what proportion of such cases prove to have mucosal changes of the pernicious-anæmia type, this figure also remains to be determined Gastric biopsy, in the hands of its inventors, has proved a useful research tool As a diagnostic technique it is still in the chrysalis stage, and its emergence depends on the answers to questions like those we have posed

Annotations

THE COST OF ILLNESS IN HOSPITAL

WE all know that hospital costs are rising, and that they put an increasing burden on the British taxpayer, but at least this burden is widely distributed among sick and healthy alike, whereas in other countries, if the wage earner of limited means, whether by mischance or lack of foresight, fails to cover himself fully by voluntary insurance, even a short illness in the family may spell financial disaster The investigation in hospital of a pyrexia of unknown origin can cost as much as £60, and when a patient with tuberculosis has a thoracoplasty his hospital costs may well amount to over £1000 As Sir Lionel Whitby remarked when he quoted these figures[1] in his inaugural address at King's College Hospital, these economic considerations were a potent factor in hastening the institution of a national medical service

An American team[2] has been studying the cost of a hospital illness to "non indigent persons" admitted in one fortnight to 13 hospitals in the District of Columbia The average inclusive cost for the 1796 patients was $285, or £100 at the present rate of exchange About two thirds of the patients subscribed to voluntary insurance schemes which defrayed a varying proportion of the charges, the remainder, who included a high proportion of the lowest income group, could claim no such relief, and some of them had to add loss of earnings to their other troubles It seems reasonable to conclude that "the cost of a single illness is often beyond the capacity of the family to meet," and the health insurance Bills now before Congress (summarised on p 815 last week) should be viewed against this background

Few people in this country today would dispute the inevitability of State help in paying the costs of illness, but it is often asked whether the State can now afford to bear the whole expense of treatment in hospital Reporting on a tour of Swedish hospitals arranged by the International Hospital Federation, Dodd[3] expresses the view that "Sweden will be making a profound mistake if it follows the British National Health Service Act and charges nothing for hospital maintenance directly to the patient at the time of entering hospital Whether the patient is allowed to insure privately or has to do it through the State is not so important as the principle involved—namely, that patients in hospital should not receive entirely free board and lodging which the patient ill at home has to pay for out of his own resources" Rees[4] remarks that, "though the N H S has been widely advertised as a free health service, it has never been advertised as a free hotel service," and he advocates a charge for board of £1 a week for those hospital inpatients who can afford it Sir Ronald Davison, who was the first to publish proposals on these lines,[5] suggested a standard charge of £2 a week for accommodation, food, and service, and estimated that 50% of patients might be expected to pay this in full while another 25% might pay half He calculated that in May, 1949, when he wrote, these charges would save some £26 million, which could more usefully be employed in the extension of medical facilities and staffs Unpleasant though the reintroduction of a means test would be, the proposal has merits which have never yet, perhaps, been sufficiently considered

HOUSE-FLIES

THOSE who have shared their dinner in the Near East with *Musca domestica* will not usually attach much importance to the half dozen specimens which rest on the kitchen ceiling at home But the house fly is an offensive animal, and in towns at least, neighbourly behaviour demands that it should not be given suitable nurseries

1 *King's Coll Hosp Gaz* Autumn 1950 p 68
2 Wiprud T Altman I *J Amer med Ass* 1950 144 835
3 Dodd J Swedish Hospitals and Health Services Bristol British Hospitals Contributory Schemes Association 1950
4 Rees J O M *Brit med J* Dec 9 1950 p 1328
5 Davison R *Lancet* 1949, 1 797

in damp refuse In the country it is harder, of course, to abolish breeding places, but with common sense and residual insecticides the problem is not insoluble Those asked for advice on the subject can do no better than recommend a recent publication designed for the lay man by the Ross Institute[1], this emphasises general principles of fly destruction avoiding that excessive dogmatism which leads to disappointment

We should all, no doubt, be keener on destroying flies if there were stronger evidence that they play an important part in the spread of disease During campaigns in the Near East it has been noted several times that the number of hospital admissions for dysentery varied with the active fly population, and the point of this observation has been sharpened by the finding of species of shigella (and of *Salmonella typhi* and the virus of poliomyelitis) on the feet of flies which have had access to human excreta But we need to know more. For example how many flies abandon the delights of the latrine for the joys of the kitchen and can one fly carry enough organisms to infect one man? (Tubercle bacilli occur in the mouths of those with phthisis, glasses on licensed premises often receive no cleaning beyond "a lick and a promise" Does the tosspot hence run a much greater risk of infection than the abstainer?) And the danger of an argument based on coincidence is that it may be no more than co incidence, it is possible that the seasons of maximum fly population in the Near East were also those of foulest climate, fungal diseases of the skin, and universal longing to be elsewhere Hope's[2] classical paper on the relation of temperature, flies and infantile enteritis is convicting evidence only up to a point, for three successive years the disease became prevalent as soon as the fly population reached a certain level, but that this did not occur in the fourth year suggests that the relation was not a simple one of cause and effect

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6 Ross S Burke F G., Rice E C Washington J A Stevens S. *J Amer med Ass* 1950 143 1459
7 Galton F Finger Prints London 1892
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Cherrill suggests that finger prints in general, and the white lines in particular, might be valuable aids to medical diagnosis Unfortunately, however, the illustrations he gives are not very convincing They include prints in Darier's disease (keratosis follicularis) and poliomyelitis, and from a doctor with lesions caused by radium In the girl with poliomyelitis prints from the unparalysed hand were normal, but those from the paralysed hand showed abnormal distension of the mouths of the sweat glands (the minute white dots running in single file along the ridges) and atrophy of the corneous and Malpighian layers of the epidermis, so that in places two fine ridges appeared where a normal print has a single ridge Such double ridges are a recognised feature of prints taken some time after the epidermis of the finger has been removed, they may be produced by the double row of papillæ normally present in the dermis immediately below each epidermal ridge Cherrill also includes the prints of a patient with spinal tuberculosis to show how, as the disease progresses, the papillary ridges atrophy to knife edge dimensions When Braasch and Nickson [3] took wax impressions of the finger tips in radiologists and a control group they found abnormalities of the papillary ridges, ranging from localised flattening to general atrophy or proliferation, in 48% of the radiologists and 1 8% of the controls The incidence rose with years of exposure to reach 100% in the radiologists who had practised for over thirty five years Degenerative changes in the ridge patterns and nail beds seem to be a usual finding in very old people An example of atrophy of the papillary ridges presumably resulting from a congenital defect of the skin is reported from South Africa by Dr Findlay and Mr Barnes in this issue (p 846) Their patient, a Bantu girl of 13, is the first recorded case of congenital porphyria in an African In addition to widely distributed cutaneous bullæ, crusting, and scarring, mainly on the exposed parts, the girl had stiff claw like fingers, with tightly drawn skin, the pulp of her terminal phalanges was sclerotic and translucent, and the paronychial tissues had retracted so that the nails overlapped the finger tips at the sides The right thumb and index finger were most severely affected, and since the child was right handed the sclerosis seems likely to have been precipitated by everyday trauma rather than sunlight

To experienced observers like Chief Superintendent Cherrill the terminal phalanges no doubt offer useful clues to their owner's state of health as well as his identity, and a dermatologist in search of a thesis subject might do worse than choose "The Fingertips in Disease, with special reference to the Medical Applications of Finger prints"

MEDICAL EXAMINATIONS IN WALES

Greenwood and Lewis Faning,[4] writing on the statistics of medical graduation, noted a surprising lack of published material—surprising because, as they pointed out, "the medical profession has been longer and more sedulously examined than others" Among their statistical predecessors in this field they were able to claim only the London Hospital surgeon, Walter Rivington, who published in 1879 and 1888 two large and partly polemical books on the degree examinations of the University of London Earlier records may have existed, but Greenwood and Lewis Faning cite Munk for the allegation, made "with proper indignation, that the loss of certain eighteenth century records is believed to be due to the desire of an officer of the College [of Physicians] to conceal the fact that *he* had once been ploughed"

The twentieth century statistician has an altogether easier time of it, and Lewis-Faning [5] has made good use of facilities afforded him by the Welsh National School of Medicine for a study of examination results over a ten year period He had at his disposal records of all students admitted to one or other of the university colleges of Wales for preclinical training, during the years 1933–42 Altogether 470 of them proposed studying for the Welsh degree, and it is with these students that the report mainly deals They were divided into three groups those with total exemption from the preliminary subjects (physics, chemistry, and biology), those with partial exemption (one or two subjects), and those with none These groups contained respectively 38, 92, and 340 students For the men exemption in physics was slightly commoner than in biology (19% against 15%), while for the women a far higher proportion were exempted in biology (28%) than in physics (8%)—presumably a reflection of teaching differences in the schools One purpose of the survey was to compare the three exemption groups in terms of their subsequent examination results It had been held that those whose training in the preliminary subjects was completed within the university had a better foundation for later studies than those who had passed the first examination before admission to the university The evidence, however, seems to be against this view Thus none of the total exemption group dropped out through later examination failure, while of the partial exemption group 5% and of the no exemption group 24% were eliminated If other causes of wastage, besides failing examinations, are taken into consideration the elimination rates become 13% for the total exemption, 14% for the partial exemption, and 32% for the no exemption

Similar comparisons can be based on other criteria, such as average number of unsuccessful attempts at each examination, proportion of passes at each attempt, or time taken to obtain the degree, and each of these supports the same conclusion Even when allowance is made for the fact that the exemption groups had fewer examinations to take, they still appear to have the advantage One possible reason is that at schools the candidates for the Higher Certificate, which affords exemption, are usually selected for their ability More over, Johnson [6] has pointed out that in the London 1st M B the failure rate among external students is far higher than that normally found among internal students of the university, and this could well be taken to indicate a higher level of ability in those who pass externally If this is also the case in Wales, the total-exemption group could be regarded as more highly selected than the others, and the difference in prognosis between the groups would reflect the stringency of the examinations they had passed rather than the quality of their training

If all three groups are considered together, it appears that the over all wastage rate is about 27%—notably higher than the figure of 12½% which the Goodenough Committee were inclined to accept as representative, and probably a more realistic estimate [7] Some information was also available about qualifications other than the Welsh Of all students enrolled in this ten year period 52% studied for the Welsh degree alone, 10% for both Welsh and London degrees, 23% for the Welsh degree and the Conjoint examination, and 4% for all three The remaining 11% either attempted only London or Conjoint, or failed to sit any examination Among those who set out to take a London degree the wastage rate was higher than it was among those who set out to take a Welsh degree, but these wastage rates do not enable one to compare the two examinations, since many who obtain a Welsh degree do not seek another

WE have to record that SIR LEONARD PARSONS, F R S, died in Birmingham last Sunday

3 Braasch N K Nickson M J *Radiology* 1948 51 719
4 Greenwood M. Lewis Faning F *Lancet* 1937 II 277
5 Lewis Faning E Report on the Examination Performance of Medical Students 1933–48 Welsh National School of Medicine Cardiff 1950
6 Johnson M L *Lancet* 1949 II, 529
7 Report of the Interdepartmental Committee on Medical Schools H M Stationery Office 1944 Pp 255

Special Articles

CORONARY DISEASE AND MODERN STRESS *

I McD G STEWART
M D Lond, M R C P
SENIOR MEDICAL REGISTRAR, BRISTOL ROYAL INFIRMARY, TUTOR IN MEDICINE IN THE UNIVERSITY OF BRISTOL

THERE has been a vast increase in coronary disease during the present century The malady strikes predominantly men in middle life It is common to all modern States, yet in some thickly populated parts of the world it is unknown The immunity enjoyed by members of primitive races disappears if they subject themselves, in exile, to the rigours of civilised life Two main influences are brought to them by civilisation —unfamiliar mental stress, and increased richness of diet The first of these is considered here

THE MIND AND DISEASE

We are continually assured that the 20th century belongs to the Common Man In medicine it is the Whole Man who has become the fashion This is the age of the psychosomatic approach An early question to be decided on first encountering a patient is What sort of person is this ? In the language of the initiate, assiduous efforts are now made to relate organic illness with basic personality type It proves a considerable task, since personality not only creates its own endogenous stresses but also determines such factors as occupation, which further introduce the extraneous influences of environment

In some diseases, however, the relation appears clear enough Thus, few doctors could have much difficulty in agreeing with Avery Jones (1948) that sufferers from peptic ulceration tend to be "tense, possess unusual drive, and are over conscientious in their work They worry unduly, but do not give way to their emotions" In fact, they belong to what Ogilvie (1949) describes as the "surgical registrar type," a category not so narrow, one ventures to think, as totally to exclude medical registrars

A similar connection between disease and type of personality is sometimes claimed on grounds which appear less substantial. Wittkower (1938) studied 40 unselected cases of ulcerative colitis According to him the illness was preceded by psychological abnormalities in 37 of them He ascribed to these patients a fair selection of the traits of human temperament In particular he decided, like Hardy (1945), that colitis tends to occur in a "mother's boy" sort of person, contrasting thus with the psychologically mature ulcer type Paulley (1949) now suggests that the temperament of regional ileitis victims may be somewhere between the two At this rate it appears that a precise mentality is shortly to be affixed to disorder in every foot of gut

Inevitably there is also a "coronary type" personality Most physicians have their own ideas of it The psychiatrists are explicit Describing the temperaments he found in a group of people who had suffered coronary infarction Arlow (1945), at a meeting in America, remarked that 'what disturbed these patients most was to fail in the rôle of their deeper identification, and to fail under circumstances which convinced both the outer world and themselves that they were not as good as they thought " Fear of failure, he observed, was always liable to turn to aggression, "the kind of identification one sees in women " It was then associated with "sexual fear and identification with the male " accompanied by "a desire to oppose them in open competition"

The trouble with this kind of speculation is that it is too comprehensive There is something for everybody "I thought I recognised myself rather clearly" was Dock's comment after he had listened to these observations by Arlow There remains always the fundamental question How far does all this affect structure ? "Do you gentlemen mean," inquired Boas quizzically at the same distinguished gathering, "that these mental mechanisms are the cause of arteriosclerosis ?"

In truth the problem is not simple Ogilvie (1949) accepts essential hypertension as "a new disease, and a stress disease the price the millionaire pays for his directorships and the clerk for his failure" But when asked how stress can cause this effect he replies "I do not know, and if anyone does he has not told me" Any attempt to find a psychosomatic explanation for coronary atheroma and its syndromes must encounter much the same difficulty Witts (1949) has pointed out that the rôle of the mind in the pathogenesis of organic illness is more difficult to assess than is popularly supposed, and that in those few maladies, such as thyrotoxicosis, in which its influence has been established the demonstration has been achieved only as a result of elaborate laboratory research, never (according to Witts) from the recesses of an armchair And seldom, I suggest, from within the curtained closets of the psychiatrists Nevertheless, there are recognisable today many associations between conditions of life and specific illness Always there is the hope that study of such links may produce a clue to ætiology That the stress of modern times may contribute to the causation of coronary disease is a possibility that merits such examination

The genesis of mental stress must depend on the nature of the predicament that causes it in relation to the character of the person involved Heredity is the main factor in the determination of character Admittedly it is responsible for much else besides At this stage let us consider in all its aspects heredity as it bears on the ætiology of coronary disease Later there will be examined the forms of mental stress which may be evoked by modern conditions of life in persons whose native temperament renders them susceptible Finally there will remain to be answered the fundamental question whether sufferers from coronary disease can be identified as the particular victims of these new mental stresses

HEREDITY

Boyd (1934) includes coronary disease among those conditions which may result from inherited constitutional "weakness" Coombs (1926) and Hadfield (1927) took much the same view Indeed the contention is scarcely in dispute It receives general assent from clinicians Cassidy (1946) considered that half his cases showed a family history of the illness, and Levine (1929) holds that heredity is of "considerable importance," adding "it is amazing how frequently one finds various members of the same family suffering from early vascular hypertension or coronary disease" Ryle (1948), too, accepted the fact that "genetic factors" probably play a part, "whether through physical or temperamental predispositions or both" Dock (1946) points out that there is a hereditary variation in the thickness of the coronary intima which follows the sex difference in the incidence of coronary disease

Controlled statistics have been provided by Yater et al (1948) for myocardial infarctions in young American soldiers They discovered a history of coronary or hypertensive disease in 41% of close relatives, a term which they define as including only father, mother, brother, and sister This percentage they compared with a group of hospital amputation patients Of these only 13% admitted a similar family history Hypertension and coronary disorder are, of course, by no means invariably associated Nevertheless there exists a close

* Extracted from the Carey Coombs prize essay, University of Bristol, for 1949

relation between the two, particularly among women at all ages and in the older patients of both sexes It is reasonable to conclude that heredity is an important factor in the pathogenesis of coronary affection Further inquiry is thus suggested into the physical and mental components of diathesis

The famous physicians of the recent past judged constitution to be of great significance In assessing it they tended, perhaps, to rely more upon physical qualities than upon the temperament of their patients Hurst, in the tradition of Addison, Bright, and Hodgkin, was wont to assume a whole chapter of information from the width of a costal angle According to this school of thought coronary disease develops in the sthenic or Falstaffian type of man Osler (1910), however, already took account of temperament in maintaining that he could recognise his angina patients as they entered the room He described in detail "a well set man from 45 to 55 years of age, with military bearing, iron grey, and florid complexion " He would be "robust and vigorous in mind and body, the keen and ambitious man, the indicator of whose engines is always set at 'Full Speed Ahead'" Levine's (1929) phraseology is much the same "The typical patient is a well set person, somewhat overweight physically strong with the appearance of good health and capable of vigorous physical effort" Many physicians today would agree with these impressions

In Boston they deal with somatotypes According to White and Ferrero (1949) they have been finding there that it is "the mesomorphic young male who is particularly prone to early coronary thrombosis " whereas the ectomorphic type is happily spared Even in America, however, statistics scarcely keep pace with clinical impressions Yater et al (1948) concluded that stature was irrelevant

Investigation by many authorities has, in fact, revealed that the physical element in constitution, so far as it is perceptible to clinical examination, is not very helpful Little more can be shown than the fact that obesity, particularly in men, predisposes somewhat to coronary atheroma The hereditary variation in the thickness of the coronary intima may be of much greater importance

Neither can there be any clear cut standard of "temperamental predisposition" to mental stress The test of war proves that the resources of human nature are unpredictable In time of peace a man's inherent temper guides him in his choice of employment Any tension which his work may engender then plays back on his mind and personality It is reasonable, therefore, before attempting to survey the problem of stress as a whole, to pass from the mental and physical sanctions exacted by heredity to those deriving from environment as presented by education, occupation, and class

EDUCATION, OCCUPATION, AND CLASS

It is well established that not all members of the community are equally menaced by coronary disease Doctors are wont to complain with reason that they are worse hit than any Much has recently been written on the subject in America It has been shown that the death rate among medical practitioners rises sharply, in comparison with the average, above the age of 45, this increase being largely due to cardiac maladies Dublin et al (1947) give as 1 18 the mortality ratio expressing the death rate due to heart disease among doctors compared with that affecting the general male population of parallel age Others go further Dickinson and Walker (1948) echo Osler and many of their own contemporaries in declaring roundly that "heart disease is in reality an occupational hazard of the medical profession" The *Journal of the American Medical Association* (1944) blamed it for 1 death in 5 among American physicians During a clinical meeting in the same year Dock observed to his interested colleagues that coronary affliction might well be worthy of their interest, since "a quarter of us in this room are going to die of it"

How does this proportion compare with that in other professions? Cassidy (1946) maintained that there was "an unquestionably heavier incidence of coronary disease in the non hospital as opposed to the hospital population" Although they refer to a period which includes some of the years before the war of 1939–45, the figures provided by the Registrar General's last Decennial Supplement afford information of great interest The adult population is divided into five successive classes on grounds of occupation and income, two factors which a few years ago bore a closer relation to each other than in these days, when the charwoman is so much better off than the ward sister, and the income of a prolific docker exceeds that of a celibate university tutor Class 1 contains the professional workers, and the grades then proceed to class 5, which is made up of unskilled labourers It is seen that the proportion of deaths from coronary disease is well above the average in the first two classes, and well below it in the last three Even more remarkable is a comparison of occupational groups in which the figure 100 is taken to represent the average death rate from coronary disease for all males aged 20–65 The following significant figures are revealed

Agricultural workers	32
Coalminers below ground	40
Banking and insurance officials	183
Anglican clergy	218
Physicians and surgeons	368

In the face of such evidence it is difficult to see how Master (1947) can justify his contention that "no occupation has any priority in this disease," even if it be true that "rich and poor, the labourer, the executive, the ordinary man at his desk are all possible victims" His view sharply exemplifies the dissent at the highest professional level that so often enlivens discussion of the ætiology of coronary heart disease

Less attention has been paid to physical stress Levine (1929) is "inclined to think that hard physical work is conducive to early disease of the coronary arteries" He declares himself to have been "impressed by the fact that athletes seem to succumb to vascular disease in surprisingly early years of adult life" It is generally believed, however, that great exertion never initiates damage to the heart The effect of physical labour was further investigated in America by Phipps (1936), who showed that the prognosis after a thrombotic attack was better in his labouring class patients than in the white collar workers

It seems to be beyond dispute that the better educated, and those who work with their brains, are more liable than their fellows to coronary disease Why this should be is not clear Reasonably it may be postulated that these people are exposed to a particular form of stress If it could be proved that such stress may lead to metabolic change, perhaps to increased blood pressure, an important step might have been taken towards finding a cause for generalised atheroma There would still require to be explained the strange predilection by which atheroma develops disproportionately in the coronary vessels, arising there not infrequently in the total absence of lesions elsewhere According to Dock (1946) "the chief cause of death of American men during their period of highest earning capacity is to be sought in the peculiar susceptibilities of a few tenths of a gramme, or at most in a few grammes, of coronary intima" This selectivity of the pathological change is the kernel of the problem The solution must await the results of further research conducted in the laboratory and requiring the assistance of expert biochemists

nd morbid histologists From such recondite spheres ıere speculation withdraws ın modest confusion In he meantime it is important that improved understanding y clinicians can already indicate the most likely victims 'he appreciation is empirical but none the less valuable

What is it, then, that in the lives of professional men redestines so many of them to death from coronary ısease ? Are they more harassed than their less educated ontemporaries ? Do their ranks contain a monopoly ıf "worriers" ?

Mental stress is elusive It does not flaunt its dominion Rather does it lurk within the shadows of life The hapes which it assumes are infinite, and constantly hanging, appearing to no two men alike Trials which o some might be intolerable are by others not even per eived Is there some form of stress which weighs upon he "workers by brain" more heavily than upon the 'workers by hand" ? It is necessary to go more closely into these questions

ORIGINS OF STRESS

Nowadays it is scarcely possible to open a newspaper without seeing a reference to the "stress" of modern existence It seems to be held almost universally today that things are pretty tough—bad enough, in fact, to account for almost anything

Most leading cardiologists regard this proposition with caution There was a time when many of them seemed ready to welcome it as an explanation of the new forms of vascular disease Paul White has admitted that in the first edition of his book *Diseases of the Heart* the element of stress as a factor in the pathogenesis of coronary disease was emphasised in italics, in the second edition the reference appeared in ordinary print, in the third it was deleted

The trials of life have usually appeared exceptional to the generation called on to bear them In 1910 Osler was already asking whether the "high pressure life" of the new century was making angina more common To readers of Sackville West the Edwardian period now suggests the tranquillity of a Golden Age In the slums, at the turn of the century, things were less happy, but Osler was not referring to the troubles of the poor Time, like distance, lends enchantment The magnolia-scented South of America was perhaps never quite so gracious as reputed of the days that are gone with the wind, nor England ever so "merrie" as she appears in retrospect Mere survival during the Wars of the Roses and the Rebellion must have provided ordeals no less trying than the modern fish queue It is tempting to agree with Master (1947) when he maintains that "stress and strain today is not greater than that which existed in ancient times during periods of war, great fires, plagues, and famine" Yet in those times coronary disease seems to have been rare

Neither is it easy to trace evidence of particular stress in those who have developed heart-disease Cassidy (1946) believed that most of his cardiac patients had lived "remarkably placid and sheltered lives" Levine (1929) has written "Concerning mental tension it is our impression that it is only of minor importance in coronary disease" Despite such scepticism the Spens Committee accepted the suggestion that it is the "strain of medical practice" that shortens the expectation of life in doctors—largely because of heart-disease

What conclusion can be drawn from such varied opinions ?

Mankind has always been subject to the constraints of human bondage The question thus becomes Has there developed during the last few decades, as a result of the increased "pace" of life, any special stress bearing preponderantly upon the educated male section of the community ? I believe that there has—and that its influence is becoming more widespread

The essence of this stress is that it confronts its victim with an opposition which he feels himself driven to combat, and capable of surmounting, but only at the cost of extreme and long continued effort In the end he is as likely as not to fail, to have it forced upon him, in fact, as Arlow (1945) suggests, that he is not as good as he thought "Ambition minus reality equals neurosis," writes Beverley Nichols, quoting the words of a woman psychologist who thus identifies the source of many ills in modern America Or it may be that a man's work is mentally distasteful to him Experimentally such a situation has been investigated by Wolf and Wolff (1946), who found that a healthy individual when "asked to do a task he did not relish at which he was convinced he would fail, exhibited a striking increase in blood pressure," which might persist for forty eight hours

The corroding effect of such endeavour is not usually revealed The physician may miss it Indeed he is seldom consulted and has little opportunity to discern it Disasters such as flood and famine, war, and pestilence are outside the control of the individual They do not produce the same tension They are accepted—since there is no alternative The victim becomes *débrouillard* He does what he can If that should not suffice, he cannot blame himself There is no element of competition He need not feel that he has wasted half a lifetime, that if things had been a little different then he, and not Jones, would have won the promotion on which he had set his heart

Not all temperaments are susceptible to this modern stress Women are almost immune It belongs to the office and the technician's bench, not to the kitchen or the Labour Exchange For all sorts of women there is perhaps no greater anxiety than that of too often repeated pregnancies The haunting possibility of what seems an almost intolerable further burden is seldom far from the thoughts of the average housewife Yet should her fears be realised she is usually ready to accept what appears to be inevitable No mental conflict develops She is saved by her philosophy of acceptance So also is the unskilled labourer—and for the same reason

Today, more than ever before, the intuition of the manual labourer is to put his trust in collective action and wait for something to turn up "The worker has not got the individualistic ethic" wrote Giles Romilly recently in the *New Statesman*, "his standards and values are coöperative, not competitive" Individual providence he regards with contempt Whatever the size of his pay packet he makes a point of spending all that he earns So long as things are going well for him, he takes inflated prices in his stride, scorning to limit his consumption of beer and tobacco while continuing to invest an average of ten shillings a week on horses dogs and football pools He is content, if not with his lot, at least with himself No sentiment of self reproach assails his peace of mind Neither is he troubled by ambition He does not plague himself to master new techniques Indeed he is profoundly suspicious of all change unless it promises shorter hours or higher pay One of his deepest instincts is his distrust of rivalry in any form To him the faintest breath of competition carries with it the odour of past exploitation He wants neither more nor less than his fellows Loyalty to his "own people" is his supreme concern. All his problems are *laid upon the altar of this restricted solidarity* He knows it for his source of strength and he will have no truck with anything that might impair it From time to time he is likely to decide in conjunction with his mates that it would best serve his interest to take a few days off On these occasions it may well happen that a private soldier being required briefly to take his place, will learn between breakfast and lunch to perform

with equal efficiency the labour at which he has spent a life time He will observe the fact without a pang

The same tendency is plain among adolescents It remains the dearest wish of most of them to leave school at the earliest possible moment, thus qualifying without delay for the quick rewards available in industry Neither do they later evince the slightest desire to learn more than will barely suffice for their employment A recent inquiry conducted by the West Hill Training College revealed much about the habits of teen agers in Birmingham The general impression was judged to be "depressing" The lives of these boys and girls, it was thought, must be "empty and barren" The organisers of the inquiry professed themselves "astonished" that the standard of writing and spelling should be so poor, and that the reading of a great many should be limited to "comics" Such findings are unlikely to surprise anyone who has lived with troops or worked in the wards of a hospital As might have been expected, the cinema was shown to be universally popular among these young people, the whole group averaging three visits a fortnight Expense proved no handicap They had plenty of pocket money Indeed about 13% of the boys were betting regularly each week Of their newspapers the *Daily Mirror* easily topped the list Not that they concerned themselves greatly with the happenings of the day With few exceptions the most that might be said of their study of affairs was that if their interest could be momentarily captured by a comic strip, or a picture of a half naked girl, it might prove possible so far further to entice their recalcitrant attention as to bring them to figure out a line or two of black type

It is surely undeniable, from a cursory study of contemporary life in England, that most people, both young and old, feel no inclination whatever towards individual self betterment No doubt it has always been so Illiteracy fifty years ago was far more wide spread even than it is now Despite the temporary setback of war it will no doubt continue to decrease Neither does absence of personal ambition imply any lack of manifold stalwart virtues, though perhaps it is to be feared that the changed economic and political trends of the modern world will threaten increasingly those whose philosophy is that of acceptance Orwell (1949) saw the workers of 1949 as the "proles" of 1984 They had undergone a subtle degeneration "Heavy physical work, the care of home and children, petty quarrels with neighbours, films, football, beer, and, above all, gambling, filled up the horizon of their minds To keep them in control was not difficult " But the proles, nevertheless, whatever their masters may have thought of them, were the only happy people in Oceana One can be sure that, like their prototypes, they were little troubled by coronary disease

How different is the attitude of the minority During the last fifty years the progress of what Witts calls the Second Reformation has induced the stirrings of ambition in many young men who, in an earlier age, would have spent their lives in manual toil. No other possibility would have occurred to them Today their newborn hopes have been fostered by increased facilities for secondary education As a result these budding engineers, clerks, and craftsmen have found themselves entering into bitter competition with each other in an effort to secure scope for their new talents and consequent entry to the pathways of personal advancement In this way new sections of the population have become exposed to the modern form of stress The struggle which awaits them proves severe Blacker (1949) points out that the aspirations so kindled are likely to become increasingly thwarted There are not enough places to go round To quote a university student "There is a sense of fighting all the time ," with the consciousness that "it is vital not to let anyone get ahead" While the contest lasts poverty depresses the standard of living among these young men below that of the lowest paid manual worker Of those that fail few can accept with equanimity the return to well fed serfdom in factory dock, or mine They have lost their habit of acceptance The memories of vanished hopes pursue them relentlessly in defeat Nevermore can they escape their own attempt to strike out for themselves

There remain too, in England, the tattered survivors of the former "middle classes," from whom it is now thought proper that resentful and idle mediocrity should exact every conceivable tribute From the first these were the chosen victims of coronary disease, whether or not as the result of their way of life. Recently the many modern troubles which assail their domestic security have become disproportionately aggravated In the words of Mabane (1949) "to all who pursue an independent life, and who by their ability and effort achieve a high earning capacity, the problem of provision for retirement and even more, provision for dependants on death, is a constant and gnawing anxiety"

At this half way stage of the twentieth century there are, in fact, two Englands , but they are not the Englands referred to by Disraeli when he wrote of the Chartists in his novel *Sybil*, not the England of power and privilege on the one hand and poverty and constraint on the other Rather does the division lie today between the few who still regard independence as the ultimate goal striving towards it in circumstances of unprecedented difficulty, and the many who are prepared to surrender it in return for the nebulous rewards offered by the Welfare State Only upon the few does modern life exert its particular stress, and from among them exact its fatal tribute

CONCLUSION

Here then is a significant parallel New conditions of stress, and a heavy preponderance of coronary disease, have in recent years arisen concurrently within the same small sections of civilised communities These two developments have been present long enough for it to be possible that the first should be cause and the second effect It is, in fact, reasonable to identify sufferers from coronary disease as the selected victims of modern stress Little more can be said at present Nothing is proved Nevertheless, the coincidence is remarkable.

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EMARKABLE FEAT OF ENDURANCE BY A YOGI PRIEST

RUSTOM JAL VAKIL
M D Lond, M R C P, D T M &H

MARKABLE feats of endurance, often bordering on fantastic or miraculous, are by no means rare in 1 In spite of their frequency, these endurance of *yogis* or *sadhus* continue to excite our admiration disbelief So far as I am aware, very few, if any, scientific studies have been made in an attempt to over the physiological explanation of them The ent report represents but an amateurish attempt to am one of these feats that I had the interesting rience of following up at close quarters

n Wednesday, Feb 15, 1950, at precisely 5 P M, the first, ry, phase (often called the *bana samadhi*) of the *yogic* feat begun when Shri Ramdasji, an emaciated *sadhu* of hyp emic habitus and middle age, entered an airtight sub anean concrete cubicle on one of the main highways of bay city The act was witnessed at close quarters by l over 10,000 spectators

he walls of the cubicle, which measured $5^1/_2$ by $4^3/_4$ ft, e constructed of slabs of concrete 7 in thick firmly ented at the edges to make the cubicle both airtight and tertight, the total air capacity of the cubicle worked out 216 c ft the lid or roof of this cubicle which was cemented place afterwards, was another slab of concrete 3 in thick l six walls of the concrete cubicle were lined or studded ernally with thousands of iron nails 3 in long, most of them l and rusty

After the *sadhu* had sat down with legs crossed in the sub rranean chamber, the lid was put on and sealed with cement ncased within this shell of concrete, the *guruji*, according to is disciples and followers, is supposed to remain in a state of spended animation and meditation or *samadhi*

Exactly fifty six hours after the start of the *samadhi* a arrow opening was bored into the lid of the cubicle, and with e aid of a fire hose about 1400 gallons of water was intro uced into the concrete cubicle, the narrow opening being bsequently sealed Thus began the second or wet phase the *jala samadhi*) of the *yogic* feat, this lasted about six and half hours, the *sadhu* remaining all this time within the ubicle in a state of almost complete immersion

At 8 A.M on Sunday morning the concrete lid of the cubicle was detached and the yogi lifted out of the water placed on a high and specially erected *pandal*, and immediately subjected to a clinical examination by me He was in a state of semi consciousness or stupor with closed eyes and flaccid limbs The pupillary reflexes were present but sluggish The pulse, whose rate was quite regular at 80 per minute was of low volume The blood pressure was 112/78 mm Hg, and the respirations were only 8–10 per minute and regular After a few whiffs of smelling salts the *sadhu* opened his eyes and took heed of his surroundings Except for some scratches and cuts over the lower extremities and trunk he appeared none the worse for his gruelling experience He had remained within the concrete cubicle for just over sixty two hours

COMMENTS

In connection with this *yogic* feat it is interesting to recall that J B S Haldane once enclosed himself in an airtight tank for an hour apparently receiving no harm In his opinion the oxygen requirement of a man doing light work is about 24 c ft per twenty four hours, whereas that of a man lying perfectly still is only about 12 c ft a day or 1/ c ft an hour According to Haldane's figures the *yogi* could have remained alive within his concrete cubicle of 216 c ft capacity for eighty six hours, whereas he spent only sixty two hours in it

Although these physiological considerations may rob this *yogic* feat of much of its mystery, nevertheless one cannot but admire the courage and endurance of this frail and emaciated man who allowed himself to be encased within an airtight chamber, lined with 3 in nails, for sixty two hours

THE KING'S FUND

Hospital Costing System

PRESIDING at a meeting of the General Council of King Edward's Hospital Fund for London on Dec 13, the Duke of GLOUCESTER said that people still some times ask what the Fund is doing today Some seem to find it almost incredible that it should be free to use its own discretion, and that its help should be constantly sought But it is, and today the Fund is doing more direct practical work to help hospitals and their patients than ever before It is recruiting nurses, arranging the admission of patients, designing new kitchens, and advising on the latest equipment for any hospital that needs the help In addition to all this, the Fund is training future hospital administrators, medical records officers, and others, it is investigating the finance systems of the hospitals, and is providing relief accom modation for hospital beds In all these things its activities are directed towards improving the hospital service while keeping the cost down

The fact is that the new administrative arrangements are on their trial, and some time must elapse before it can be assumed that they are providing a service that is both humane and economical But the new set up has come to stay, and the Fund is anxious to do all it can to help We have, at the express invitation of the Ministry of Health, undertaken an extensive costing investigation at a number of hospitals, and I should like to enlarge a little upon it The Fund has long possessed much information about the organisation and management of hospitals, their finances, and accounting methods In 1939 the scope of its activities was extended, and at the time of the passing of the National Health Service Act budgets were becoming fairly common, stores records, and in some cases stores accounts also were being introduced, quantity statistics were prepared, and a number of hospitals were considering the introduction of cost accounts The present investigation therefore, may be regarded as an extension of an existing activity of the Fund rather than a new one It will, however, go much further than any investigation hitherto carried out Its purposes are to investigate the existing systems of accounting to design and install a costing system, and finally to supervise its operation in a limited number of hospitals When satisfied as to its practicability the Fund, with the Nuffield Provincial Hospitals Trust, which is carrying out a similar investigation in the provincial hospitals, will present a joint report to the Ministry of Health

The system will at the same time bring about the all essential integration of finance and administration the lack of which at present is seriously impairing the efficiency of hospital administration

Referring to other activities of the Fund, the Duke said that it was expected that the Hospital Admini strative Staff College would open in April, 1951 The rehabilitation of the many convalescent homes dotted over the southern counties was now largely accomplished Thanks to the substantial allocations made by the Fund and to the energetic work put in by the convalescent homes committee, under the chairmanship of Sir Henry Tidy, most of the homes were functioning in a way that would certainly not have been possible without help from the Fund A detailed survey was being made of cases in hospitals needing convalescence, and the committee hoped to get definite figures which would dispose of the uncertainty which had for years surrounded this subject

The distribution committee had this year been able to help several of the hospitals lying outside the National Health Service with special grants to tide them over difficulties, and—more important in the long run—with sound advice which should lead to balanced budgets

The provision of a number of homes for the aged sick had proved no easy task Difficulties in the way of acquisition of suitable properties could not always be foreseen and had to be solved as they came to light. The Fund had, however, already opened three homes, and a further seven properties were in process of adapta

with equal efficiency the labour at which he has spent a life time He will observe the fact without a pang

The same tendency is plain among adolescents It remains the dearest wish of most of them to leave school at the earliest possible moment, thus qualifying without delay for the quick rewards available in industry Neither do they later evince the slightest desire to learn more than will barely suffice for their employment A recent inquiry conducted by the West Hill Training College revealed much about the habits of teen agers in Birmingham The general impression was judged to be "depressing" The lives of these boys and girls, it was thought, must be "empty and barren" The organisers of the inquiry professed themselves "astonished" that the standard of writing and spelling should be so poor, and that the reading of a great many should be limited to "comics" Such findings are unlikely to surprise anyone who has lived with troops or worked in the wards of a hospital As might have been expected, the cinema was shown to be universally popular among these young people, the whole group averaging three visits a fortnight Expense proved no handicap They had plenty of pocket money Indeed about 13% of the boys were betting regularly each week Of their newspapers the *Daily Mirror* easily topped the list Not that they concerned themselves greatly with the happenings of the day With few exceptions the most that might be said of their study of affairs was that if their interest could be momentarily captured by a comic strip, or a picture of a half naked girl, it might prove possible so far further to entice their recalcitrant attention as to bring them to figure out a line or two of black type

It is surely undeniable, from a cursory study of contemporary life in England, that most people, both young and old, feel no inclination whatever towards individual self-betterment No doubt it has always been so Illiteracy fifty years ago was far more wide spread even than it is now Despite the temporary setback of war it will no doubt continue to decrease Neither does absence of personal ambition imply any lack of manifold stalwart virtues, though perhaps it is to be feared that the changed economic and political trends of the modern world will threaten increasingly those whose philosophy is that of acceptance Orwell (1949) saw the workers of 1949 as the "proles" of 1984 They had undergone a subtle degeneration "Heavy physical work, the care of home and children, petty quarrels with neighbours, films, football, beer, and, above all, gambling, filled up the horizon of their minds To keep them in control was not difficult" But the proles, nevertheless, whatever their masters may have thought of them, were the only happy people in Oceana One can be sure that, like their prototypes, they were little troubled by coronary disease

How different is the attitude of the minority During the last fifty years the progress of what Witts calls the Second Reformation has induced the stirrings of ambition in many young men who, in an earlier age, *would have spent their lives in manual toil. No other* possibility would have occurred to them Today their newborn hopes have been fostered by increased facilities for secondary education As a result these budding engineers, clerks, and craftsmen have found themselves entering into bitter competition with each other in an effort to secure scope for their new talents and consequent entry to the pathways of personal advancement In this way new sections of the population have become exposed to the modern form of stress The struggle which awaits them proves severe Blacker (1949) points out that the aspirations so kindled are likely to become increasingly thwarted There are not enough places to go round To quote a university student "There is a sense of fighting all the time," with the consciousness that "it is vital not to let anyone get ahead" While the contest lasts poverty depresses the standard of living among these young men below that of the lowest paid manual worker Of those that fail few can accept with equanimity the return to well fed serfdom in factory, dock, or mine They have lost their habit of acceptance The memories of vanished hopes pursue them relentlessly in defeat Nevermore can they escape their own attempt to strike out for themselves

There remain too, in England, the tattered survivors of the former "middle classes," from whom it is now thought proper that resentful and idle mediocrity should exact every conceivable tribute From the first these were the chosen victims of coronary disease, whether or not as the result of their way of life Recently the many modern troubles which assail their domestic security have become disproportionately aggravated In the words of Mabane (1949) "to all who pursue an independent life, and who by their ability and effort achieve a high earning capacity, the problem of provision for retirement and even more, provision for dependants on death, is a constant and gnawing anxiety"

At this half way stage of the twentieth century there are, in fact, two Englands, but they are not the Englands referred to by Disraeli when he wrote of the Chartists in his novel *Sybil*, not the England of power and privilege on the one hand and poverty and constraint on the other Rather does the division lie today between the few who still regard independence as the ultimate goal striving towards it in circumstances of unprecedented difficulty, and the many who are prepared to surrender it in return for the nebulous rewards offered by the Welfare State Only upon the few does modern life exert its particular stress, and from among them exact its fatal tribute

CONCLUSION

Here then is a significant parallel New conditions of stress, and a heavy preponderance of coronary disease, have in recent years arisen concurrently within the same small sections of civilised communities These two developments have been present long enough for it to be possible that the first should be cause and the second effect It is, in fact, reasonable to identify sufferers from coronary disease as the selected victims of modern stress Little more can be said at present Nothing is proved Nevertheless, the coincidence is remarkable

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Public Health

OUTBREAK OF FOOD-POISONING DUE TO SALMONELLA ABERDEEN

WILLIAM BROCKBANK
M.A, M.D Camb, F R C P
PHYSICIAN IN CHARGE OF A UNIT AND DEAN OF CLINICAL STUDIES, ROYAL INFIRMARY

C METCALFE BROWN
M D Glasg, D P.H,
Barrister-at-Law
MEDICAL OFFICER OF HEALTH

M T PARKER
M B Camb,
Dipl Bact
DIRECTOR, PUBLIC HEALTH LABORATORY

MANCHESTER

IN the summer of 1949 a widespread outbreak of infection due to *Salmonella aberdeen* occurred as a result of the consumption of meat pies manufactured in Manchester and bought from different branches of one catering firm Of the 50 cases 29 occurred locally (Manchester outbreak) and the rest in a party of scouts who ate the pies on their way to Scotland (Torridon outbreak) Since infections with this organism seem to be rare, we thought it desirable to publish our findings

THE MANCHESTER OUTBREAK

On the evening of July 28, 1949, the Public Health Laboratory was informed of 4 cases of suspected food poisoning in two households in an area to the south-east of Manchester, and that meat pies bought from the local branch of a Manchester firm were thought to be responsible A specimen of fæces and the unconsumed portion of a pie were received at the same time Next morning it was clear that an organism of the salmonella group was responsible Within a few hours reports of further cases in two other areas on the outskirts of Manchester were received During the next few days specimens of fæces from several patients and the remainder of a second pie were examined An apparently identical salmonella was isolated from all

In the meantime the divisional medical officers of the affected areas telephoned all the local practitioners to seek information of other cases, and several further groups were discovered In addition, 1 person infected with the same organism who denied eating any of the suspected pies was found All subsequent attempts to trace the source of his infection failed

Inquiries in Manchester revealed that the pies causing illness had been made on July 26, and sold by twelve branches of the firm, 206 pies and 450 sausage rolls had been distributed to the branches and practically all sold. As a result of all inquiries, 29 cases in eleven family groups were discovered all the patients had eaten pies made on the same day No cases could be attributed to the sausage rolls

The main symptoms were diarrhœa and vomiting, but the common presence of pyrexia, malaise, and pains in the limbs had suggested a salmonella infection Five patients were admitted to hospital. One interesting feature was a case of acute gastro enteritis in a dog fed with part of a pie which gave rise to 2 human cases

It is instructive to note the circumstances which led to the discovery of the 29 cases Eighteen were traced through inquiries by medical officers of health after the existence of the outbreak had been established Of the other 11, 3 came to light when a practitioner sought assistance in securing their admission to hospital, and 4 because they were relations of members of a public health department, 1 was diagnosed by blood culture after appendicectomy 3 were reported by practitioners to a medical officer of health by telephone None were notified

Causative Organism

An organism of the salmonella group was isolated from the fæces of 21 patients and from the blood of 1 other It was also obtained from thirteen meat pies and 1 symptomless excreter It was isolated at about the same time from the fæces of 1 other patient whose connection with the outbreak was doubtful

Twenty eight strains were examined in detail and found to have identical characteristics They were gram negative motile bacilli which grew well on ordinary media They gave acid and gas in glucose, maltose, mannitol, dulcitol, arabinose, rhamnose, xylose, and trehalose in eighteen hours, but not in lactose, sucrose, salicin, or inositol in fourteen days They were all H_2S positive and indole negative, and did not liquefy gelatin They were not agglutinated by salmonella O sera of groups A, B, C, D, or E It was subsequently found that they were agglutinated to full titre by an *S aberdeen* O serum On first isolation they were largely in the specific phase and were agglutinated by a *S typhimurium* H serum Six strains were submitted to the Salmonella Reference Laboratory at Colindale Dr Joan Taylor reported that they had the antigenic formula XI 1 ⟷ 1, 2, 3 and were therefore *S aberdeen*

TORRIDON OUTBREAK

A group of 18 scouts and 9 adults, including one of us (W B), left Manchester on the evening of July 27 bound for a walking holiday in Scotland They took with them thirty small meat pies packed in a biscuit tin These were eaten for lunch in the train between Inverness and Achnasheen at about 12 30 P M on July 28 Sixteen boys and 6 adults ate at least part of a pie, some more than one

In the afternoon of the same day camp was pitched in a rather exposed position at the eastern tip of Loch Torridon, and a latrine was dug in a distant part of the field It began to rain heavily that evening and continued for six days with occasional strong gales One or two members of the party had some diarrhœa that evening, but the existence of an epidemic was not realised until those on duty rose to prepare breakfast It was then clear that something was wrong There were several pools of vomit and at least one pair of soiled pyjamas lying outside the tents Twenty one of the party had diarrhœa, vomiting, and abdominal pain to a greater or lesser extent, and many of them were feverish All had eaten at least part of a pie, and only one pie eater was unaffected

During the next two days there was little improvement in most of the victims, and on July 31 two scoutmasters and six boys had temperatures of 101°F or more Diarrhœa was still apt to be sudden and violent At this stage Captain Gunter, of Torridon House, kindly arranged for the worst eight cases to be transferred to the top floor of his house with two able bodied adults to look after them An attempt was made to consult the local doctor, but he was away on a long distance call up the loch

On Aug 1 the doctor arrived It was then decided to send a scoutmaster and a boy who were still feverish to Invergordon Isolation Hospital One more boy was transferred from the camp to the house Next day two of the boys in the house had relapsed with temperatures of 103°F, and one other was still feverish All three were transferred to hospital

The camp was due to move next day to the neighbourhood of Loch Maree and, the weather still being very bad, a search was made for covered accommodation On Aug 3, therefore, the remnants of the party were moved by bus to a small corrugated iron drill hall at Kinlochewe There were still two obvious invalids who, although afebrile, were lethargic and looked poorly The rest seemed fully recovered

tion The British Red Cross Society and other voluntary bodies which had undertaken the management of the homes had coöperated wholeheartedly with the hospital authorities and the Fund in all the preliminary work This was essentially a pilot scheme, with two objects to give some of the old people who must otherwise be hospital cases more home like care, and at the same time to get the beds in the hospitals free for others who too often cannot obtain admission

Sir EDWARD PEACOCK, treasurer, said that during the year £230,000 had been spent on ordinary expenditure, and £92,000 on capital and non recurrent items, whereas the disposable sum upon which the Fund could rely was some £300,000 a year or a little more A further £100,000 had been received from the Nuffield Trust for the Special Areas, and was being added to capital The late Lord Wakefield had made the Fund one of the residuary legatees of his estate, with an instruction that any sum received should be treated as capital, and £200,000 had recently been received

Sir ARCHIBALD GRAY, chairman of the distribution committee, speaking of the nine homes now being provided for the aged sick, said that the Fund was anxious to emphasise that they were intended, not for the completely bed ridden, but for "frail ambulants" who could enjoy the attractive gardens and other amenities of the houses

Disabilities

57 OLD AGE

WHEN does old age start? I feel inclined to extend the normal three score and ten to 75 Life today is longer and, granted reasonable health and mental freshness, no one should *feel* really aged before then Of course, when no more than five and forty, a man with a family growing up may remark, "I am getting on" This, however, is a pose, and the next day, to prove his fitness, he will take a twenty mile walk After 60 he may, as a precaution, take things easier, but this without a trace of certain symptoms which will appear later He may escape serious accident or illness and be spared one or other of those bodily visitations which call for drastic surgical treatment Yet sooner or later there comes a day when he realises that age is upon him Yes! And suddenly he feels a wave of intimate sympathy with the frail, for whom previously he had a lordly pity

The first warning is often ignored Probably the patient has neglected to be perfectly frank with his doctor There has been a momentary shock, but equilibrium is restored, and in the absence of any perceptible change he proceeds on his journey Years may pass before another red light appears My own came at about the 75 contour line while I could still carry on normally What is the reaction when deterioration can no longer be ignored? I leave on one side the question of bodily or mental collapse Also I accept as normal the slow response of muscles and the hesitancy of functional organs The man I have in mind is still mentally vigorous, still full of life, with a steady hand and good eyesight, who knows clearly that, now, he *is* old Secretly he resents it Intelligence, imagination, enthusiasm, capacity for work, all are there, but (and it is a big but) control is waning This applies to head and limbs alike, for these are in mutual sympathy

Firstly, in respect of the head there may be no sudden vertigo, but there is a precautionary reluctance to turn round or stoop down An upward glance or a sharp turn of the head provokes momentary giddiness, while a downward bend to pick up something reveals a lack of correlation between head and knee muscles The worst trial of all is to stand still indefinitely while a lady discourses at large on the movements of her relations This question of balance is interesting because of its contradictions Rough hilly ground would not disconcert me, walking a 9 inch plank over a [illegible] stream would not unnerve me, over a wooden or [illegible] wire fence I could climb without hesitation But give me a streak of ice on a wintry road, set me on a chair without a supporting hand hold, and I should shirk it some conspiracy between head and limb would warn me To a doctor one does not communicate this kind of childish weakness Can determination overcome it? Or is it wiser to capitulate gracefully?

Then, on the physical side, there comes awareness that exercise of any kind produces tiredness, and this is emphasised by shortness of breath There may be no pain and no stiffness in the muscles, but just a weariness inclination to get out of the way and rest And when the brain is active again you resent this, you are still nursing the unconquerable hope, still clinging to the delusion, that you are *not* old It is long since you felt an inclination to run, but you do hope for [illegible] to walk without threat of faintness But that hilly bit of road over the bridge, that flight of steepish steps that parcel of books you are carrying, that window you wish to open, that table you want to move! Tackle all or any—and some obscene little demon laughs in your ear

It is here, too, that the mental side comes in From ordinary mental overwork a man may seek refuge in physical exercise, but on reaching the stage when physical work is beyond him, where can he turn for recreation? It is easy to suggest read, write, or resort to chess or bridge, but at 75 or 80, with little capacity for physical exercise, can the mind be rested by mental exertion greater than it had to bear between the ages of, say, 20 and 70? Ordinary business or professional pursuits provide a routine which eases the strain, but in retirement routine is swept from the daily schedule Companionships might do much to stimulate, but environment changes as age approaches Contemporaries drop by the way, and if retirement has involved a change of scene new companionships are not quickly acquired nor are they quite so intimate Thus age has often to be passed in comparative seclusion

Apart from trifling lapses of memory or moments of absent mindedness, a man of 80 may feel in full possession of all his former mental faculties and yet be honest enough to ask himself how far is this justified and how much is mere wishful thinking? If he attempts to write a book or an article, or to deliver an address will the impression left on reader or hearer be that of virility or senility? He cannot tell, but the secret dread of disillusionment is ever present My own experience of men is that even in age the capacity for study, research, concentration, analysis, and interpretation may remain unimpaired At 80 a man may show an inclination to suspend judgment on matters of the moment, but in thought he may have much to contribute Where weakness may emerge is in yielding to mental restlessness—this at least in the case of one who has led a very active life and who chafes at enforced inactivity Restlessness, too, unless combated, may easily develop into impatience and possibly depression, and as the man is usually aware that his blood pressure is above normal he is conscious that impatience reacts on bodily as well as on mental fitness

Age presents many problems, but to the old man whose mind remains active the greatest is this At his desk, fully occupied, he feels fit, calm, and contented He needs recreation, however, as well as rest When the body can no longer provide the exercise that would afford the needed recreation, is there any other compensation

*** This article concludes our present series on Disabilities We are hoping to publish a selection from them in book form —ED L

1 in Manchester and 5 in Scotland) Very little formation was obtained about the rate of clearance the organism from the fæces In only 3 patients hose occupations were connected with the food industry ere regular specimens examined for a month At ie end of this time 2 were still excreting the organism nd 1 had become negative at about the seventeenth ay after infection

The organism was isolated from blood cultures in all cases in which it was attempted when the temperature as 99 F or higher Two of these occasions were during elapses Serum agglutinations were done in a few cases n the second week of disease and a high titre of agglutina ion of *S aberdeen* O and *S typhimurium* H specific as obtained The series was too small and selected o the results to be of much value Total and differen- al white-cell counts in a few of the cases showed ather normal values or mild leucopenia with relative ymphocytosis

FACTORS INFLUENCING ATTACK RATE AND SEVERITY OF INFECTION

A total of 238 pies and 450 sausage rolls made on July 26 were distributed for sale about 20 of the pies were large (1 lb) and 210 small (4 oz) Of the eleven amily groups of cases in and around Manchester six with 21 cases followed the consumption of seven large pies Four groups with 7 cases were due to ten small pies Eaters of large pies consumed an average of a third of a pie each, as compared with a whole pie each for the eaters of small pies Thus the apparent attack rate for large pies was about 30%, and for small pies between 3 and 4% The true rates for both groups were certainly higher than this, but it seems that the risk of illness from large pies was greater than that from small pies The attack rate within the family group was 100% for large pies and about 70% for small pies

In the Torridon outbreak the situation was quite different Here only small pies were consumed but they had been kept for a further twenty four hours at atmospheric temperature The high apparent attack-rate (95%) may well have been due to the presence of medical supervision. However if this had been the only difference between the scouts and the Manchester group one would have expected a higher proportion of mild cases among the former In fact, 5 of the 8 severe cases and only 3 of the 12 mild cases occurred at Torridon, and there is little doubt that the average attack was more severe in this group

The quantity of pie eaten by the patients varied from 2 to 12 oz Of the 49 cases in which information is available the average consumption was 4 9 oz for mild cases, 4 4 oz for moderate cases, and 4 1 oz for severe cases

The patients were aged 2½–65 years and of either sex There was no obvious association between age and severity of attack within these limits.

INVESTIGATION OF OUTBREAK

On July 29 the bakery at which the pies had been made was inspected It was a large modern plant employing about 100 persons The standard of cleanliness was high, and good sanitary accommodation was provided.

Preparation of Pies

The meat used for both pies and sausage rolls was supplied ready for use by a wholesale butcher It had been minced, seasoned, and mixed with 'filler' A consignment of 80 lb was received each Monday Tuesday, Wednesday and Thursday, and used the same day

The pastry was made from flour cooking fat, salt and water The dough was 'blocked out' on a modern pie making machine and the prepared meat was hand-filled into the "blocks" by three female employees The same machine was also used for "crimping" on the tops of the pies, which were then placed in the oven for 25–30 minutes at 450–475°F The gelatin was added after baking Sheet gelatin was soaked in water, dissolved in fresh boiling water, and filled into the pies from a jug as soon as it had partially cooled No eggs or egg products were used

The pies were stored at room-temperature overnight and taken next morning to the twelve branches for sale They were normally sold on the day of receipt and with few exceptions eaten on the same day

Bacteriological Investigations at Bakery

None of the pie makers had recently had any gastro intestinal disturbance One of the bakers was absent from work with diarrhœa and vomiting but he had taken home some of the pies from the incriminated batch He and his family had become ill after eating them

The bakery was first visited on a Friday, when no pies were available for sampling Owing to the Bank Holiday, specimens of fæces from the three pie makers were not obtained until Aug 2 All were negative except that of a middle aged woman, from which a scanty growth of *S aberdeen* was obtained Three subsequent specimens taken between Aug 8 and 12 were negative None of her family gave any history of gastro-enteritis, and their fæces were negative The woman admitted that she was in the habit of eating pieces of raw meat while filling the pies

Specimens of sheet gelatin, washings from the tin in which the gelatin was softened and a mouse trapped in the bakery were examined bacteriologically with negative results Specimens of six batches of pies made between Aug 5 and 15 were bacteriologically negative.

Butcher's Shop

The meat used for the preparation of the pies consisted of five parts of hindquarter beef and one of fat pork It had been received on July 23 and prepared two days later Conditions at the shop were very unsatisfactory, and legal proceedings were successfully taken against the firm It was impossible however, to establish that the infection had been introduced from this source, or to find out whether meat from a single carcass had been used for the preparation of mince on successive days

Samples of minced meat and of debris from the mincing machine and from the crevices of the cutting-up table on July 29 were negative bacteriologically The fæces of all four employees and specimens of prepared pie-meat collected on six subsequent occasions were also examined without result No salmonellæ were isolated from the only mouse trapped on the premises

Other Investigations

On July 29 a divisional medical officer took possession of eighteen meat pies and seven sausage rolls which were on sale at one of the branches These were stated to have been made on July 28—i e , two days after the batch responsible for the outbreak—and subsequent investigations confirmed this Two of the pies were sent to the laboratory and the rest stored in the basement of a town hall A heavy growth of *S aberdeen* was obtained from both of the pies Unfortunately the rest of the batch could not be secured until Aug 2, but in spite of having been five days at room temperature and become heavily contaminated with moulds the organism was isolated from nine of the sixteen pies None was obtained from any of the sausage rolls It is therefore certain that batches of pies other than the one responsible for the outbreak were contaminated with *S aberdeen*

DISCUSSION

S aberdeen was first described by Smith (1934), who isolated it from a sporadic case of mild gastro-enteritis

The weather having now improved, two expeditions were organised These did much to improve the spirits of the party, but unfortunately one of the boys on his return complained of headache and a recurrence of abdominal pain and had a temperature of 102°F His recovery being slow, he was sent to hospital on Aug 6 One other boy, who usually abounded in energy, remained strangely lethargic though perfectly happy and had not fully recovered when the party returned home The party began the journey home on Aug 16, picking up five of the six hospital patients on the way Some of the latter had clearly lost a lot of weight and looked pallid In two cases it was well into October before recovery was complete

Only for two short periods did any of the patients cause real anxiety while at Torridon On the first day a boy complained of pain and was tender over his appendix for a few hours, and four days later he suddenly developed a generalised urticarial eruption, which was fortunately only short lived

Subsequent inquiries showed that the pies responsible came from the same day's baking as those causing the outbreak in the Manchester area, but they were eaten about twenty four hours later

Salmonella aberdeen was isolated from the fæces of 5 and from the blood of 2 of the 6 patients in Invergordon Isolation Hospital

CLINICAL CONDITION OF MANCHESTER AND TORRIDON PATIENTS

The 21 Torridon patients were under continuous medical supervision, and full clinical histories are available The county M O H of Ross and Cromarty has kindly allowed us to make use of the case notes from the Invergordon Isolation Hospital With the help of other medical officers of health and hospital physicians it has been possible to collect clinical histories of 26 of the 29 cases occurring in and around Manchester Three were diagnosed after a considerable interval, and they have not been included in the following analysis The single case in which there was no history of eating a meat pie has also not been included

Most of the patients had gastro enteritis with fever In over half the cases the most prominent symptoms were diarrhœa and vomiting, but these symptoms were usually accompanied by a feeling of general malaise and pains in the limbs and back or headache There were other cases in which the gastro intestinal disturbance was less prominent and the appearances were very like those of a mild enteric fever In two cases there was no gastro enteritis and the symptoms were those of a pure septicæmic disease There were also cases whose symptoms suggested an acute surgical abdominal condition Several of the more severe cases had short febrile relapses with or without a return of the gastro enteritis

Incubation Period

The average incubation period of all the cases was 13 hours (range 5–24 hours) There was no significant difference between the average incubation period for those eating pies on July 27 and 28

Cases with Gastro enteritis

Of the 47 patients, 45 had some diarrhœa, and of these 33 had vomiting, 27 had abdominal pain, and 18 had vomiting and abdominal pain, 4 had diarrhœa only Other symptoms included headache (13 cases), generalised aches and pains (11 cases), and lassitude (4 cases) The *temperature* was recorded in 40 cases and was raised in 36 of these It exceeded 100°F in 29 cases, 101° in 16, 102° in 10, and 103° in 4 The highest recorded was 104 5°F The presenting symptom was diarrhœa in 20 cases, vomiting in 3, diarrhœa and vomiting in 5, abdominal pain in 11, headache in 3, and anorexia in 3

Twelve cases were classified as mild, 27 as moderate, and 8 as severe Five of the 8 severe cases were in the Torridon outbreak. The duration of illness varied greatly 5 patients were incapacitated for 1 day only, 17 for 4–5 days, 9 for 6–7 days, 3 for 10 days, 1 for a fortnight, 5 for 3 weeks, 4 for 4 weeks, 1 for 5 weeks, and 2 for 10 weeks

The following cases illustrate the varieties encountered

Mild a man, aged 49, ate one small pie at 1 30 P.M. on July 28 There were no symptoms until 7 A.M next day, when he passed a fluid stool For forty eight hours he was lethargic with slight fever (maximum 99 2°F) but could get about with an effort After this he felt fully recovered but continued to pass two fluid stools daily until Aug 2

Moderate a scout, aged 15, awoke feeling sick and dizzy eleven hours after eating one small pie He vomited several times during the next forty eight hours and had diarrhœa for four days He was feverish for three days (maximum 100°F) Recovery was complete after four days

Severe a man, aged 23, ate one small pie at 1 30 P.M. and two more at 5 15 P M on July 28 At 10 P.M the same night he woke with violent abdominal pains and diarrhœa Fever (101–102°F) and diarrhœa persisted for five days. He was sent to hospital on Aug 1 but was afebrile on arrival and remained so He was discharged on Aug 16 having lost a stone in weight He looked poorly and was easily tired and short of breath He was not fit to play energetic games until the middle of October

Severe with relapses a scout, aged 17, became ill seven and a half hours after eating one small pie Diarrhœa persisted for five days and vomiting for two days He was feverish for two days (101°F), but the temperature was normal by the evening of Aug 1 Next morning he had relapsed (102 8 F) with a tender distended abdomen He was sent to hospital where *S aberdeen* was isolated from his blood His temperature became normal on Aug 6, but rose to 99°F on Aug 9, 14, and 15 He was detained in hospital for three weeks and lost $1^1/_2$ st He was short of breath on exertion and easily tired for several weeks afterwards He was not fully recovered until early October

Cases Simulating Appendicitis

A girl, aged 13, developed acute vomiting and abdominal pain in the early hours of the morning about fourteen hours after eating a small pie In the afternoon she was sent to hospital, where acute appendicitis with peritonitis was diagnosed At 11 P M her abdomen was opened the appendix was kinked and bound to the cæcum by adhesions and was moderately inflamed The mesenteric glands were enlarged Next day the temperature was 103°F and the patient passed two motions *S aberdeen* was grown from blood collected on this day Fever persisted until Aug 8, and the patient was discharged on Aug 20

A scout, aged 15, became ill with headache and abdominal pain twenty hours after eating a small pie His temperature was 100°F, and he was tender and rigid over the appendix In view of the other cases in the camp it was decided not to send him to hospital for the time being The diarrhœa came on soon afterwards, and the localised tenderness vanished

Cases of Pyrexia without Gastro enteritis

Only 2 such cases occurred, and 1 of these had some abdominal pain

A woman ate half a large pie, and after twenty-one hours had a headache with a temperature of 100°F, which lasted twenty four hours There was no diarrhœa or vomiting This case was not confirmed bacteriologically, but *S aberdeen* was isolated from the remainder of the pie and from the fæces of another person who had a severe gastro enteritis after consuming half as much as this patient had

A scout, aged 17, ate half a small pie on July 28 He developed headache, abdominal pain, and fever twenty four hours later At no time did he vomit or pass a fluid stool but *S aberdeen* was isolated from the fæces The fever (101°F) lasted six days, and he was the first to be sent to hospital Convalescence was slow, and he was not fully recovered for a month

BACTERIOLOGY

The causal organism was isolated from the fæces of every patient from whom a specimen was examined

l in Manchester and 5 in Scotland) Very little ormation was obtained about the rate of clearance the organism from the fæces In only 3 patients ose occupations were connected with the food industry ere regular specimens examined for a month At e end of this time 2 were still excreting the organism id 1 had become negative at about the seventeenth w after infection

The organism was isolated from blood cultures in all cases in which it was attempted when the temperature as 99 F or higher Two of these occasions were during lapses Serum agglutinations were done in a few cases the second week of disease and a high titre of agglutination of *S aberdeen* O and *S typhimurium* H specific as obtained The series was too small and selected r the results to be of much value Total and differential white-cell counts in a few of the cases showed ither normal values or mild leucopenia with relative mphocytosis

FACTORS INFLUENCING ATTACK RATE AND SEVERITY OF INFECTION

A total of 238 pies and 450 sausage rolls made on nly 26 were distributed for sale about 20 of the pies ere large (1 lb) and 210 small (4 oz) Of the eleven mily groups of cases in and around Manchester six ith 21 cases followed the consumption of seven large s Four groups with 7 cases were due to ten small s Eaters of large pies consumed an average of a hird of a pie each, as compared with a whole pie each r the eaters of small pies Thus the apparent attack-ate for large pies was about 30% and for small pies etween 3 and 4% The true rates for both groups ere certainly higher than this, but it seems that the isk of illness from large pies was greater than that from mall pies The attack-rate within the family group as 100% for large pies and about 70% for small pies

In the Torridon outbreak the situation was quite ifferent Here only small pies were consumed but they ad been kept for a further twenty-four hours at atmospheric temperature The high apparent attack-rate 95%) may well have been due to the presence of medical upervision. However if this had been the only difference etween the scouts and the Manchester group one would ave expected a higher proportion of mild cases among he former In fact, 5 of the 8 severe cases and only of the 12 mild cases occurred at Torridon, and there ittle doubt that the average attack was more severe i this group

The quantity of pie eaten by the patients varied from to 12 oz Of the 49 cases in which information is avail ble the average consumption was 4 9 oz for mild cases, 4 oz for moderate cases, and 4 1 oz for severe cases

The patients were aged 2½–65 years and of either sex here was no obvious association between age and everity of attack within these limits

INVESTIGATION OF OUTBREAK

On July 29 the bakery at which the pies had been made was inspected It was a large modern plant employing about 100 persons The standard of cleanliness was high and good sanitary accommodation was provided.

Preparation of Pies

The meat used for both pies and sausage rolls was supplied ready for use by a wholesale butcher It had been minced. seasoned, and mixed with filler A consignment of 80 lb was received each Monday Tuesday, Wednesday, and Thursday, and used the same day

The pastry was made from flour cooking fat salt and water The dough was "blocked out" on a modern pie making machine and the prepared meat was hand-filled into the "blocks" by three female employees The same machine was also used for "crimping" on the tops of the pies which were then placed in the oven for 25–30 minutes at 450–475°F The gelatin was added after baking Sheet gelatin was soaked in water dissolved in fresh boiling water and filled into the pies from a jug as soon as it had partially cooled No eggs or egg products were used

The pies were stored at room-temperature overnight and taken next morning to the twelve branches for sale They were normally sold on the day of receipt and with few exceptions eaten on the same day

Bacteriological Investigations at Bakery

None of the pie makers had recently had any gastro-intestinal disturbance One of the bakers was absent from work with diarrhœa and vomiting but he had taken home some of the pies from the incriminated batch He and his family had become ill after eating them

The bakery was first visited on a Friday, when no pies were available for sampling Owing to the Bank Holiday specimens of fæces from the three pie-makers were not obtained until Aug 2 All were negative except that of a middle aged woman from which a scanty growth of *S aberdeen* was obtained Three subsequent specimens taken between Aug 8 and 12 were negative None of her family gave any history of gastro-enteritis, and their fæces were negative The woman admitted that she was in the habit of eating pieces of raw meat while filling the pies

Specimens of sheet gelatin, washings from the tin in which the gelatin was softened, and a mouse trapped in the bakery were examined bacteriologically with negative results Specimens of six batches of pies made between Aug 5 and 15 were bacteriologically negative.

Butcher's Shop

The meat used for the preparation of the pies consisted of five parts of hindquarter beef and one of fat pork It had been received on July 23 and prepared two days later Conditions at the shop were very unsatisfactory, and legal proceedings were successfully taken against the firm It was impossible, however, to establish that the infection had been introduced from this source, or to find out whether meat from a single carcass had been used for the preparation of mince on successive days

Samples of minced meat and of debris from the mincing machine and from the crevices of the cutting-up table on July 29 were negative bacteriologically The fæces of all four employees and specimens of prepared pie meat collected on six subsequent occasions were also examined without result No salmonellæ were isolated from the only mouse trapped on the premises

Other Investigations

On July 29 a divisional medical officer took possession of eighteen meat pies and seven sausage rolls which were on sale at one of the branches These were stated to have been made on July 28—i.e two days after the batch responsible for the outbreak—and subsequent investigations confirmed this Two of the pies were sent to the laboratory and the rest stored in the basement of a town hall. A heavy growth of *S aberdeen* was obtained from both of the pies Unfortunately the rest of the batch could not be secured until Aug 2 but in spite of having been five days at room temperature and become heavily contaminated with moulds the organism was isolated from nine of the sixteen pies None was obtained from any of the sausage rolls It is therefore certain that batches of pies other than the one responsible for the outbreak were contaminated with *S aberdeen*

DISCUSSION

S aberdeen was first described by Smith (1934) who isolated it from a sporadic case of mild gastro-enteritis

in an infant Subsequent records of its isolation from human sources are very scanty The only published information for England and Wales is to be found in the table summarising the investigations of the late Dr W M Scott at the Ministry of Health laboratory (Wilson and Miles 1946) Dr G S Wilson and Dr Joan Taylor have kindly provided us with some further unpublished information Scott's records contain no cases during the years 1923–38 Three "outbreaks" occurred in 1939, one consisting of a single fatal case of gastro enteritis in Liverpool No information is available about the other two, but it is improbable that they involved more than a few people The organism was isolated twice in 1940, once from a symptomless child, aged 4 years, living near Llandudno There is no information about the source of the second culture Since then the organism has been isolated on four occasions from single cases of gastro enteritis in adults at Oxford (1941), Northallerton (1946), Liverpool (1946), and Nottingham (1948)

We have been unable to find any records of human cases in other countries There are none among the 3000 infections reported from the New York Salmonella Centre (Seligmann et al 1946) or among the 3016 identified by Edwards et al (1948) in the United States The organism is not included in the large series reported in recent years from the Mediterranean (Bruner and Joyce 1947), India (Hayes and Freeman 1945), or the Pacific (Lindberg and Baylis 1946)

There are few records of the isolation of *S aberdeen* from non human sources Mallmann et al (1942) obtained it on two occasions in routine post mortem cultures from 294 chickens Neither chicken had apparently died of salmonella infection They state that this was the first time the organism had been isolated in the United States It was encountered four times among 9315 salmonella cultures from non human sources examined by Edwards et al (1948) in fourteen years All four isolations were from sporadic infections of chickens, and probably the two cultures of Mallmann et al (1942) are included in this total *S aberdeen* was also isolated from 'Ovomaltine' by Timmermann in Holland (Breed et al 1948) Despite the suggestion that the organism may be associated with poultry it is not included among the large series of salmonellæ isolated from American spray dried egg (Medical Research Council 1946, Solowey et al 1947)

It is impossible to be sure how the infecting organism gained access to the food in the present outbreak The transitory human excreter may have been responsible, but it is not certain that she was not herself infected by eating raw pie meat The existence of one apparently unconnected case of infection in the area at the same time further complicates the picture without suggesting any alternative source of infection Possibly the infection was derived from the pie meat No source of infection was found at the butcher's shop, but a single carcass from an animal with salmonella infection may have been responsible The few previous isolations of *S aberdeen* in widely scattered parts of the world provide no clue to a possible reservoir of infection

Previous evidence of the pathogenicity of *S aberdeen* for man consisted of a few accounts of its isolation from sporadic cases of gastro enteritis and was therefore inconclusive Also, Mallmann et al (1942) have reported failure to cause symptoms in rhesus monkeys by feeding large volumes of culture by stomach tube The present outbreak establishes that under favourable conditions the organism can give rise to a typical severe gastro enteritis with septicæmia

There was greater risk from eating large than small pies on the first day after manufacture, but by the second day the small pies seem to have become more capable of causing severe disease Presumably a greater number of organisms survived the oven temperature in the large pies than in the small, because of the relatively short period of heating The sausage rolls seem to have been effectively sterilised Experience with dried egg (Medical Research Council 1946) indicates that the minimal infecting dose of many salmonellæ is very large It is significant that no cases were detected as a result of eating a subsequent batch of infected pies, though the knowledge of the existence of an outbreak should have drawn attention to them

Food poisoning outbreaks due to meat pies are common, and it is difficult to know how to prevent them Hand filling is obviously undesirable, but its abolition would not guarantee safety Any food containing raw meat which is not uniformly raised to a sterilising temperature is potentially dangerous It is only necessary for a few pathogenic organisms to survive, because there is usually ample opportunity for them to multiply before the food is eaten It would be reasonable to insist that the meat be thoroughly cooked before being filled mechanically into the pies

SUMMARY

An outbreak of food poisoning due to eating meat pies infected with *Salmonella aberdeen* is described

The clinical condition was a short pyrexia, usually but not always accompanied by diarrhœa and vomiting Several of the cases were severe, and one patient underwent appendicectomy in the acute stage of the illness

The investigation of the outbreak did not reveal the ultimate source of the infection

Methods of reducing the risk of salmonella infection from meat pies are discussed

We wish to thank Dr G S Wilson and Dr Joan Taylor for unpublished information and the latter for confirming the identity of representative strains of *S aberdeen*, Dr H Macpherson for allowing us to make use of his bacteriological findings on the cases in Invergordon Isolation Hospital Drs D G Anderson, A. Telford Burn, J Landless Horne D Longbottom, C H T Wade, and R Q O Wheeler for clinical or epidemiological information, and Special Sanitary Inspector A W James, of the Manchester Public Health Department, for his help

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Measles

The biennial peak in notifications of measles is due to occur in the early months of next year Already the number of cases has reached epidemic proportions During the past two months notifications have increased at the rate of one thousand a week, for the week ended Dec 9 the total was 12,323 This is a steeper increase than that in the last epidemic period two years ago, but in 1948 the build up in the country as a whole during the late summer and autumn was more substantial

The incidence this last summer was most intense in the Potteries and the North-East, but these districts have been relatively free in recent weeks Now the majority of cases are being notified in the counties around London in Lancashire, and in Yorkshire (East and West Ridings) Of the county boroughs, Kingston upon Hull has been affected considerably more than any other, in November almost 3000 cases were notified from this source The infection is reported to be comparatively mild

Parliament

Minister on Registrars

IN the House of Commons on Dec 15, SIR HUGH ccas-TOOTH raised the question of hospital registrars connection with the Ministry of Health s recent rcular MR FRED MESSER urged the Minister to nsult the teaching hospitals and regional boards efore putting the circular into operation

MR ANEURIN BEVAN said that a large number of ctors had returned from the Services anxious to be amed as consultants, and many more posts had been rovided than was reasonable All that the Ministry as trying to do was to relate the number of registrars aming to be consultants to the number of consultant ests that might be available Obviously it was not ise to enlarge the number of specialist posts until here were the hospitals with the work The number of ramees was now nearly 3000 in 1938 the number was ot more than 750 Even the proposed new total of 700 was nearly 2½ times the pre war figure There ad been a good deal of misunderstanding about this natter, and a good deal of resistance much of it from nside the medical profession It must not be assumed hat complete harmony existed between the specialist nd the general practitioner, on the contrary, there as often a considerable amount of friction

In these days when the specialties were tending to roliferate, it was essential that some of the more ubstantial branches should have a more adequate umber of registrars, and that some of the new specialties hould not get more and some of the older ones not enough

DR CHARLES HILL asked if the Minister would invite he regional hospital boards to comment on the new establishments MR BEVAN replied 'Certainly" The main purpose of the circular was to try in future to have sufficient numbers to do the normal work of the hospitals and then to have a number of registrars who were training to be consultants In the past these categories had been blurred, and because of this there had been a tendency to enlarge the category of registrars He was certain that this step would be in the interests of all concerned.

Medicine and the Law

Accident due to Lighting Failure

A RECENT fatality at an Essex hospital, the subject of an inquest at Chelmsford, is a warning to hospital authorities not to neglect preparation for the consequences of a temporary lighting failure

An infant boy, 4 days old, was in an oxygen tent His condition and that of his twin sister caused considerable anxiety Suddenly the lights in the ward went out and the ward sister struck a match in order to see to her two little patients The tent went up in flames She turned off the oxygen and took off the tent in order to get to the baby, whom she took to another ward. She extinguished the flames There was evidence that she had had plenty of experience with oxygen tents but there was no torch available and she had not been told where any portable lighting apparatus was kept

A verdict of accidental death was recorded The coroner expressed his strong opinion that the accident was not due to ignorance or lack of knowledge but to the sister's preoccupation with her patients safety To strike a match in the darkness was perhaps an instinctive act, one done in haste with the best intentions and without thought of the consequence The coroner suggested that the hospital authorities should inquire into their emergency arrangements forthwith so that such an accident should not recur

Hospital managements everywhere will wish to satisfy themselves that the danger is appreciated

In England Now

A Running Commentary by Peripatetic Correspondents

HE wasted no time on the platitudes commonly expected on a first visit I had a quick impression of cherubic pink cheeks, a magnificent snow-white beard and morning dress (unusual in my practice), but I had no time for a further survey before he dropped heavily into the patients' chair and announced, with a strong Continental accent, "You must help me I am too thick"

I m used to patients who come to be cured of obesity, but they are generally women and most of them are under sixty, whereas this man must have been at least seventy But it wasn t for me to dissuade him from regularising his waistline, which was undoubtedly too expansive so I took up my pen and prepared to take a history It wasn t easy going, apart from the language difficulty there seemed to be some misapprehension in the old fellow s mind that we'd met before and that I must know everything about him I was convinced that I d never treated him before though when he first came in I had felt that I d seen him somewhere in different surroundings and totally different clothes

Anyway, after a quarter of an hour one thing had clearly emerged It wasn t for his looks that he wanted to lose weight but because his girth was interfering with his job 'Still working?" I inquired surprised at the staying powers of some of our seniors He shot me a glance of as near shocked contempt as that benign cheerful face could express "Every year I work ' he said with dignity "Last year I was also thick though not as now and it was a very squeeze, but this year I am already so thick I have fear I shall not get through So I come to you in good time that you may me smaller make before my work begins" Ah! Seasonal work, I thought But I ventured to hint that perhaps at his age (he was obviously comfortably off) it wasn t necessary to work at all This time I got a really scorching glance from his surprisingly youthful blue eyes But he calmed down again, and thanked me politely for the usual advice I gave him on diet and exercises.

"It is not chust for myself," he said, as he rose with difficulty from the comfortable chair I provide for my patients "It is for my staff also If I any bigger get they cannot any longer pull me At any moment they may—how do you say?—strike It is heavy for them with me, and all the extra loads, you know" "Have you a large staff?" I inquired politely "Six or eight always some extras in the stables," he replied Now at last I understood Unlikely as it seemed at such an age my patient was connected with a riding school and still rode occasionally for demonstration or teaching purposes He might even be attached to a circus—that would explain the seasonal aspect of his job

'Ah," I said knowingly, as we shook hands at the door "I see now You work with horses" "No," he replied as he turned to go 'You have forgotten, my child Reindeer"

* * *

I have been in and out of hospitals man and boy, as patient student and doctor for the past fifteen years, and I must regretfully report that many conditions have not improved in the least The old adage about a doctor having a dose of his own medicine applies with equal truth to the nursing staff The obvious relish with which a nurse, when about to give an intramuscular injection of the latest wonder drug" wipes the blunt end of a bent and rusty needle with a piece of cotton-wool dripping with ether meth or alcohol, leaving a little tuft of fibres on the barbed end, has to be seen to be appreciated She then orders the victim to roll over," bathes his skin with alcohol and, with a practised, but unsteady hand, jabs towards his sciatic nerve The needle having entered at a tangent is barely intramuscular at its barbed end, but, not bothering to pull back the plunger to find out how much bleeding is going on she presses home the plunger with a gay abandon acquired through years of malpractice thereby forcing the drug out at the bevel of the badly fitting

needle and forcing air into the patient She then gives the skin another flooding with alcohol and goes on her way rejoicing, leaving the patient who knows no better to blame the new antibiotic for the pain of his intracuticular injection of alcohol and to boast later to his relations that he "bruises so easily"

Medicines are given out, b d or q d s, always p c, and nothing will make a ward sister give them a c —unless the patient is a "gastric," when he will be given his "trisilicate" with one hand and his milk pudding with the other If any patient is rash enough to say "no" to his evening catechism he is quickly given mist alba or tabs cascara How much simpler it would be if due allowance were made for the hospital diet, consisting of white bread and potatoes, with very very rarely any fresh lettuce or properly cooked cabbage and seldom any fruit Even the most active of guts are soon undermined by such food, especially when it is supported by tabs A P C for this, that, and the other pain, headache, or malaise, not to mention the morphine derivatives, and routine dosing with "ferrous sulph" And how many hospitals have a commode? If every house governor, every matron, every member of a management committee were made to wait in bed, as patients, until their neighbour found time to wheel them to the toilet, commodes would be provided as quick as the proverbial lightning

Do physicians always realise, when they study the temperature chart, that "morning temps" are taken any time between 5 and 7 45, and that a thermometer is seldom left in the mouth for more than the "half-minute"? Nobody ever bothers about the effect of Summer Time on the time of the patient's peak temperature, and to persuade the nurses to recognise Double Summer Time in anything except hours off duty would be as great a waste of time as counting the pulse for a quarter of a minute, or with the aid of an hour-glass

Despite all the errors in their teaching, I have met only one nurse who made me mad—she simply could not do anything quietly and loved to exercise her strident voice—and there is no more sympathetic and welcome character than the night nurse who optimistically rubs a mixture of water, alcohol, powder, and soap into your gluteal muscles at three in the morning

* * *

Reassurance, I was always told, is very important in cardiology When a man who had had very severe pain in his chest told me that it was only a bad spell of his cardiac neurosis, diagnosed eight years before at my old teaching hospital, I began to see what could be done in this line An electrocardiogram with clear evidence of myocardial infarction showed that his condition had altered considerably in the interval, but his confidence in the original diagnosis was unshaken I mentioned this to a colleague and heard an even better example He was working in a hospital near the terminus of an airline, when one day an American civilian was brought in from an aircraft somewhat collapsed and with a pain in his chest Between gasps he was understood to say "This is only my cardiac neurosis Dr X (a world famous cardiologist) has been treating me for it for years" Thereupon, E C G s were taken, transatlantic telephones were called into play, and eventually the patient was persuaded to spend the necessary time in bed for his coronary collaterals to develop All this leaves me enviously feeling that I must polish up my reassurance

* * *

Have you come across one of those unfortunate surgeons who suffer from hyperactivity of the nasal mucosa? He usually wears his mask so that its upper margin lies immediately below his nose For operations lasting up to half an hour a series of powerful sniffs will successfully control the ever present menace of a drop separating itself from its host, but for longer procedures the anæsthetist or a nurse has to wield a piece of gauze, usually just in the nick of time I was pondering on this weighty problem during a lengthy operation when the answer came to me in a flash—why not Tudor Edwards spectacles fitted with continuous suction?

Letters to the Editor

THE CHANGING FACE OF SURGERY

SIR,—The address by Sir Cecil Wakeley at the Westminster Hospital Medical School, published in your issue of Dec 9, contains some observations on specialisation in surgery which I feel must be challenged Sir Cecil repeats the usual arguments of the general surgeon against specialisation when he says "Such a state of affairs is bad for teaching and makes for little progress. There is a tendency to view a patient with ultra specialist eyes and only see a minute part of the anatomy instead of considering the patient as a whole" He further states "It is important that surgeons on the staff of teaching hospitals should remain general surgeons, but it does not matter if they have a hobby—for instance gastric surgery, thyroid surgery, or urological surgery"

As the surgeon in charge of a urological department in a teaching hospital, may I point out the vast difference in "making a hobby" of gastric or thyroid surgery and of urological surgery In the first two examples a single organ is being dealt with, in urological surgery a whole system I am writing this letter a few hours after making a round of my department The range of conditions dealt with can be gauged from the following examples of disorders in patients at present occupying the beds

Renal and ureteric calculi (treated by pyelolithotomy, nephrolithotomy, ureterolithotomy, or nephrectomy), renal tumour (nephrectomy), hydronephrosis (cases which have had conservative plastic procedures), stress incontinence, urethral carcinoma, epispadias, prostatic obstructions, benign and malignant (treated by open operation or per urethral resection), and bladder carcinomata (treated by diathermy, radium, partial cystectomy, or total cystectomy) This list is incomplete and takes no account of the preliminary specialised diagnostic procedures, carried out for the most part before the patients were admitted to hospital, but it will suffice to show that something rather more than dilettantism is required of those who would undertake urological surgery Furthermore, can it be seriously suggested that in a urological department there would be less tendency to consider "the patient as a whole" than there would be if these patients were interspersed amongst others suffering from hæmorrhoids, hernias, varicose veins, and other more major surgical lesions? On the contrary the urologist with his paramount responsibility for prostatic disorders and the cardiovascular, renal, diabetic, and pulmonary complications commonly associated with them is particularly aware of the need for general assessment Many house men have spoken to me of the value of the "medical" experience they have had while occupying the resident's post in the urological department

With regard to the remark that specialisation makes for little progress, surely the opposite is the case Certainly in the past thirty years, during which urology has been finding its place as a recognised specialty, the phenomenal progress in the subject has been due to outstanding contributions by urological specialists and not general surgeons Thus, Hugh Young devised the earliest prostatic punch, and Edwin Beer showed how to destroy a growth in the bladder by electric desiccation Stern and McCarthy devised the resectoscope, and Thomson Walker and Harris advanced the technique of transvesical prostatectomy, and Zwick, working with von Lichtenberg in his urological clinic, gave us intravenous pyelography The application by the urologist, Huggins of endocrine therapy to the treatment of prostatic cancer has proved an outstanding contribution to medical science, and the retropubic extravesical method of prostatectomy by Millin a brilliant contribution to the surgery of the prostate I know of no comparable presentments to urological progress emanating from general surgeons

With regard to the problem of teaching the undergraduate must of course receive instruction in urology as part of his surgical course If as is advocated by Sir Cecil, one of the general surgeons in the teaching hospital makes urology his particular sphere, his wards are likely to have a concentration of urological cases Unless, therefore, a system prevails of all students rotating in turn round all the surgical firms—certainly an impossible arrangement in most provincial medical schools, served as they are by several hospitals each with a number of surgical units—only those attending the ward especially concerned with the urological patients will receive adequate instruction in the subject I suggest that the teaching should be integrated with the general surgical course but that it should be given by the specialist staff, who have at their disposal not only the necessary teaching material but also the out-patient, diagnostic and ward facilities for displaying it

I would affirm that the primary function of a hospital is to arrange for the optimum treatment of its patients and this obligation applies as much to the teaching as to the non teaching hospital Because of the limited number of urological departments in Great Britain, particularly in the teaching hospitals a considerable proportion of urological surgery is still carried out in general surgical units It would be difficult to contend that the standard of their urological work is comparable to that of the special departments, equipped and staffed for the purpose, though there are some outstanding exceptions to this general rule The need for urological departments has long been recognised on the European continent Many of the larger hospitals in Paris have units of over 50 beds, and in the 1000 bed hospital of the Lyons medical school the urological unit has 110 beds. In the U.S.A no hospital of standing appears to be without its urological department, many housed and equipped in a manner to be expected only in that country Let us here not attempt to put back the clock.

I feel strongly for the prestige of urology My own hospital was early in recognising the needs of the specialty and generous in responding to its claims I am anxious to see the same conditions prevailing elsewhere

Glasgow ARTHUR JACOBS

REGISTRARS

SIR,—One of the more perplexing aspects of this affair has been the method of publication of the Ministry of Health's circular B.H.B 50 106 When it appeared most people, I believe, thought it had been produced without prior consultation with the profession That seemed perhaps its worst feature We are now told by the Minister that it was "issued after full consultation with the profession's representatives"[1], and we learn that, though not an "agreed" document, its contents have, in fact, been the subject of discussions between the Ministry and the Joint Committee for some time.[2]

It is reasonable to ask in what capacity the Joint Committee stood to the Ministry in these discussions Was it acting as the general representative and mouthpiece of all consultants and registrars, or was it in the role of Whitley Council for Consultants and Specialists (which I thought was now its main, if not its only, function)? It seems doubtful having regard to the purpose of Whitley machinery, whether the subject of registrar establishments is a proper one to be referred to this committee. Whichever was the case it is difficult to understand why there was no consultation at lower levels For several months discussions have been going on between the Ministry and our representatives concerning matters which closely affect the professional life of all consultants and registrars, and most of those concerned have had no knowledge of them, and played no part in them

It has been suggested, although it seems incredible, that the Ministry asked the Joint Committee to keep the discussions confidential. If this was so, it appears that the proper course would have been for the Joint Committee to refuse to take part in them as being unwilling to commit their colleagues on such an important issue without consultation with all concerned There is no point in keeping matters of this kind confidential, and if there is pressure from any quarter to do this it should be resisted by the profession.

Evidently the discussions were fruitless and it appears that the Ministry decided to fly a kite with B.H.B 50/106 It has now, in the end become necessary to consult all levels of consultants and registrars All kinds of meetings have had to be called, often at short notice, and information on hospital work and statistics hurriedly gathered and sent to bodies such as regional hospital boards, which have become involved in unwanted labour collecting the facts and bringing forward proposals for the continuation of the hospital services about which they are naturally anxious Indignation and perplexity have been engendered at all levels, neither state of mind being conducive to balanced and thoughtful judgment If this particular problem had originally been passed down to the peripheral hospitals and consultants the necessary discussions could have taken place over a reasonable period of time This would have resulted in consultants and registrars being fully informed of the points at issue, and all would have had ample opportunity to state their case and make constructive proposals *before* the Ministry began to formulate policy

This is not the first time the hospital service has been disturbed—we went through a somewhat similar experience when the post-war registrar scheme was wound up In the present instance the Ministry itself cannot escape blame for the method of publication of this fateful document but whatever else comes out of this affair it is permissible to make the point that hospital medical staff need adequate consultative machinery at all levels up to the Ministry if the hospital service is to run smoothly and with satisfaction to the doctors who work in it The particular form this might take should become a subject for discussion at once It is doubtful if the Whitley machinery is suitable except for its already defined purposes The B.M.A Central and Regional Consultants and Specialists Committees might be suitable for the work with stronger regional representation on the central committee It would be important for the committee which finally dealt with the Ministry to be as representative of all groups of hospital doctors as possible, and for the machinery really to be used for consultation downwards In this way the top committee would voice the views of those whom it represented, and by doing so would not only bring satisfaction but strengthen its position with the Ministry An alternative arrangement would be a system of consultative machinery within the hospital service itself. The chief merit of any scheme should be the adequate inclusion, at all levels, of opinion representative of area hospitals and smaller non teaching hospitals The present difficulty is in part due to the overweighting of teaching-hospital opinion on the Joint Committee The time has come when the views of those working at hospitals which perform the major part of the clinical work of the country should be well represented in discussions with the Ministry

To return to the particular problem of the registrars, it is a fact that the circular in question has startled the profession Although its extreme proposals cannot be taken seriously its appearance has had an unsettling effect on the service Registrars sense of security has been shaken consultants are concerned as to how they

1. *Lancet* Dec. 9 1950 p 775
2. *Brit med J* suppl., Dec. 2 1950 p 225

are to carry on their hospital work, and the future of the hospital service seems suddenly darkened Much is at stake, not least the maintenance of the standard of work in many hospitals where adequate staff (consultant and registrar) has only recently been appointed for the first time It is perfectly clear that if registrars are to go, to maintain quality and quantity of work others of equal ability must take their place Discussion chiefly centres on how this shall be done You were right to have doubts about your "second premise" in your leading article of Dec 9, but the question of a junior grade of consultant is not easy to settle I suggest that a very strong case indeed can be made out for a *moderate* increase in the number of *full* consultant posts *now* In addition, a number of "assistant" or "junior" consultant posts could be made, as a temporary measure, in suitable hospitals The particular merit of these two suggestions is that most of the senior registrars who are now fully trained could be kept in hospital work, if necessary for some years, until promotion was possible to the full grade, and in this way the work of the service would be unimpaired If the number of new consultant posts of all kinds was less than the present number of registrars (and it is generally conceded that this must be so) there should be no financial drawback to this arrangement Something must be done to preserve the present standards of the hospital service and to prevent hardship among a group of able, hard working, and admirable colleagues—our registrars It has lately been proposed that consultants might make a financial contribution to ease the difficulty [3] This is very reasonable I am sure I am not the only relatively young consultant who would be prepared, for instance, to go up the incremental ladder more slowly than at the present prescribed rate But more might be needed, and consultants may have to be prepared for some sacrifice if the hospital service and the present registrars are not to suffer

One more point The importance to the hospital service of the work of registrars has been stressed by you and many others, but it must not be forgotten that registrars are in training for something higher Their number is bound to be reduced, but if too many are taken from area hospitals—even if they are replaced by other doctors—the service will still suffer because the training to be had at an adequately staffed and equipped area hospital is of value to the man training to be a consultant, and there can be no doubt that the presence of such trainees is a stimulus to the senior staff at any hospital

West Middlesex Hospital, Isleworth N F COCHILL

SIR,—The Chancellor of the Exchequer has placed a ceiling on health service expenditure which, judging by other calls on national resources and particularly those of rearmament, seems unlikely to be raised in the foreseeable future That being so, it is surely time that the Minister and his advisers decided how the available money should be spent to the best advantage, as is done in any other concern not blessed with unlimited funds

It is, I think, evident that a properly run hospital service is much more important to the community than the free supply of dentures, wigs, corsets, spectacles, and so on, to all and sundry For such a service an adequate number of specialists is essential, and on the Ministry's own showing the number at present employed is only about 65% of what it regards as the optimum The work in the hospitals of this country which cannot be undertaken by the consultants—many of whom, incidentally, are working for many hours more than their contracts call for—is undertaken by registrars, and should their numbers be reduced, as is proposed, the work of the hospitals will suffer accordingly

One need not dwell on the cynicism with which it is suggested that these men should be thrown into the discard, or at best used to obtain specialist services at cut rates in the Armed Forces, but it would be well for the Minister and his advisers to ponder whether their long training and skilled services are not of greater value to the community than the free supply of the various appliances I have mentioned I would suggest that it would be no great hardship if such facilities were limited to certain well defined groups, such as school children and old age pensioners, while others paid for them in cash, thus freeing money for more important aspects of the health services

Great Clifton Cumberland IAN MACKENZIE

SIR,—The Ministry of Health's circular on registrar appointments has caused anxiety and disquiet to senior registrars and registrars, mainly because of the insecurity which its terms imply From the apparent security of their permanent appointments consultants should convey to the Ministry their grave concern at the callous indifference shown by the suggestions contained in this document

Especially affected are those relatively senior doctors who served throughout the war and who, mainly through encouragement by the Ministry and by post war training schemes, have restricted their activities to hospital appointments with the intention of filling the consultant vacancies which they were led to believe would abound Registrars (many in their late thirties or early forties) have had these promises rudely broken, and they can foresee no security in any branch of medicine The most essential immediate step is to persuade the Ministry to freeze all registrar appointments until satisfactory plans have been made for hospital establishments

For generations hospital staffing schemes have distinguished between junior and senior appointments, but, largely through the opposition of consultants, such was the lack of foresight in the grading of the present National Health scheme that a gap was at once created through the refusal to recognise this distinction between senior and junior consultants It is likely that this anxiety and difficulty with regard to registrars would not have arisen had this gap not been created

The remedy would appear to be the formation of a grade of junior or assistant consultant Consultants must be persuaded, as must the Ministry, that such a grade is essential if hospitals are to be adequately staffed by clinicians fit to take the responsibility Without such a grade consultants will be overwhelmed by the volume of work No one in any specialty is worthy of a consultant appointment with less than ten years' experience, and appointments to the consultant grade should be made from the grade of junior consultant when the necessary further experience has been obtained Senior registrars who entered this junior grade would know that only a proportion of them would ultimately reach consultant grade, but the salary in the lower grade should be big enough to assure a reasonable livelihood These junior consultant appointments should be permanent, to provide some sense of security, and those entering the hospital service in the future should have some idea of the number of permanent appointments available Junior consultants might receive a salary of £1400 rising by £50 per annum to £2000, and after 15 years' service rising by further annual increments of £50 to £2200 They should have a separate scale of salaries and not that of consultants otherwise there will be added further anomalies to those existing today owing to the fatuity of paying all consultants alike, irrespective of the specialty, the quality and/or quantity of work, and the responsibility of the appointment Registrars who have already proved themselves of value to the hospital service should be

3 Roberts F *Lancet* Dec 9, 1950, p 766

omoted where warranted to this grade in the hospitals here their worth is known

The major proportion of work in a general hospital general (often humdrum) medicine and surgery, and ie suggestion for giving greater prominence and ;traction to minor specialties, where vacancies are ud to be numerous, should be deprecated Applicants ir these minor specialties should graduate through ie junior consultant grade rather than be given con iltant rank at too early an age The solution will ot be found by appointing more consultants to individual ospitals, as this would mean more consultants doing ss, and add to the difficulties of allotting beds or tards and operating and outpatient sessions where ccommodation did not exist

It is "assistants" (call them what you will) that are vanted More consultants will require more assistants, ind it is the latter who will be scarce if these cuts are mposed

Today too much emphasis is placed on teaching, ind teaching hospitals (valuable though they be) should not be given an excessive quota of registrars More over, teaching hospitals should not dominate decisions on new appointments to non teaching hospitals

Many hospitals today are grossly overstaffed in over all establishment, and where lavish staffing has been encouraged establishments should be pruned and brought within reasonable limits, beyond which no future reduction should be made

Among the different staffs in hospitals—as in every profession and trade in the country—the waning capacity for work should be increased, otherwise, by lagging behind, the hospital service may fall into disrepute In such directions, and too many others in the hospital service, the Ministry may find the economies for which it appears to be looking

Hillingdon Hospital
Uxbridge Middlesex W ARKLAY STEEL

SIR,—As a general practitioner, I wish to join the registrars in their protest against the proposed cut in their numbers

Out of interest and prestige general practitioners could take clinical assistantships, but they could not profess to replace the registrars Unless the number of consultants is increased or the number of registrars kept up, the volume of medical work in hospitals will inevitably fall

What of our own future? Reduced lists without an increased capitation rate become a possibility if 1100 partly trained specialists are wastefully thrown into the general practitioner market We must see the mutual relation of our problems

Abersychan
near Pontypool Monmouthshire A S JARMAN

SIR,—I agree with Dr MacWilliam [1] that merit awards, which have caused so much distaste and unrest among consultants, might be better employed in preserving the 1100 registrars who are to be summarily dismissed

Registrars have always had a long path to tread, and few reached staff appointments under 35 or 40 years, many fell by the wayside and discreetly moved away into general practice which afforded them some use of the specialty they had previously aimed at making their life's work No registrar, therefore, worthy of his salt minds the risks of defeat, they have always been present But a mass dismissal is a different matter General practice cannot absorb so many embryo specialists at once, so that many "sacked" registrars will be out of work for a long time I hope they are eligible for unemployment benefit

[1] MacWilliam H H *Brit med J* Dec. 9 1950 p 1329

The peremptory Ministry of Health memorandum, with its offensive paragraph 12, is now stated to have been discussed before publication "with the profession s representatives" I feel that many of us would dearly like to know who (if any) of our colleagues agreed to this treacherous document

The consultants must stand by their junior colleagues who are responsible for such a great part of hospital work, for without them the hospitals will surely founder, and I for one offer what services I can give to the registrar body Let my fellow consultants realise that if they permit this slaughter of their junior colleagues, without making every effort to stop it, then the way is open for future attacks on themselves

Wolverhampton E G DOLTON

SIR,—Whilst agreeing with the suggestion, in your leading article of Dec 9, that "when hospital building is approaching a standstill, it is unrealistic to suppose that the establishment of consultants can soon be brought up to the optimum contemplated in the Ministry's *Development of the Consultant Services*," I cannot see reason to suppose that *no* increase in the establishment is possible The Ministry's memorandum envisages no increase, yet the need exists, and it is partly masked by the large number of registrars, many of whom are doing work which should properly be done by con sultants An immediate increase of 500 consultants is necessary, is possible within the present limits of accommodation, and would avoid the registrar problem which threatens

Other measures are also necessary, including (1) a decrease in the rate of recruitment of registrars (2) a decrease in the number of registrars, to be achieved by not reappointing those thought unlikely to reach the top grades in the profession, (3) a restriction preventing consultants accepting more than eleven sessions (many have sixteen or more), and (4) possibly an increase in the establishment of posts of the S H M O type, as you suggest

By these means the standard of medical service will not be lowered, the ability of the best of the present registrars will not be wasted, and hardship will be minimised There would not be need to dismiss an excessive number of registrars, and those dismissed would on the whole be the less able ones To dismiss 1100 registrars regardless of ability is unjust and not in the best interests of the service And, most important, there will never again exist a pool of trained men, such as at present, from which to expand the consultant service

Middlesex Hospital London W 1 CECIL MCIVER

SIR,—The registrar problem is the concern of everyone at the present moment Most of us in the senior con sultant ranks have one or two of these younger men working with us, and we are trying to do everything in our power to ensure that they shall retain that place in the hospital service which they have already worthily earned

Yet I do not think that Dr Ffrangcon Roberts, in his letter of Dec 9, strikes just the right note in putting forward his particular solution of the problem Practising north of the border, one may be speaking from insufficient knowledge of conditions in the south, but the picture painted by Dr Roberts of the registrars doing a great deal of the most difficult operative work and much of the outpatient consultation work, and providing the means whereby the consultants are enabled to do private practice, seems overdrawn

In the Scottish teaching hospitals with which I am familiar, all important and difficult operative work and all outpatient consultation work is done by consultants Registrars do a proportion of the routine operative work

but only under supervision, and they are never in sole charge of a unit They work under definite limitations laid down not only by the chief but also by the hospital management committee They do much useful work, but they are not the key men in the hospital, nor are their services the means whereby consultants are allowed extra time for private practice

Doubtless Dr Ffrangcon Roberts speaks from conditions which he has personally observed, but he makes no reservations, geographical or otherwise, and it would be a pity if the picture he has drawn were to be regarded both at home and abroad as the true over all one Perhaps there is virtue in his solution of the registrar problem My criticism is only of the statements he has made to advance it Incidentally, Dr Roberts has solved another problem for us—namely, where private practice has disappeared to in recent times Apparently it has all centred round the Cambridge area

Glasgow ROBERT MAILER

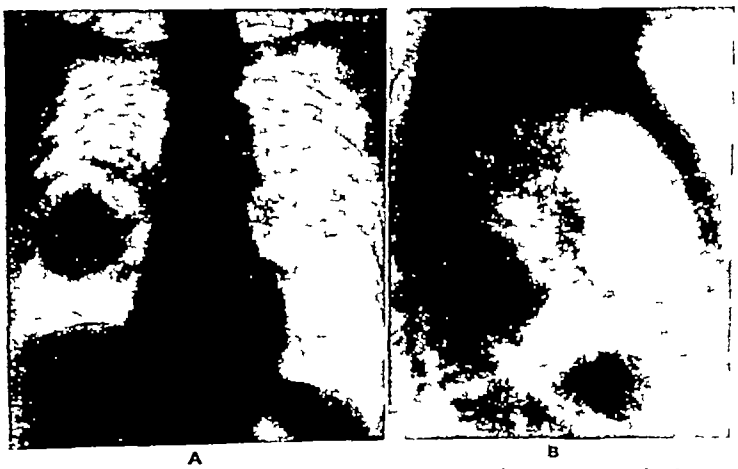
SUPPURATIVE PNEUMONIA

SIR,—The very interesting lectures by Dr Nicholson, published in your issues of Nov 18 and 25, prompt me to report a case of chronic lung abscess following staphylococcal pneumonia without signs or symptoms and with unusual radiographic appearance.

An upholsterer, aged 51, was admitted to St Nicholas' Hospital towards the end of January this year with right lower lobe pneumonia His white blood cell count was 17,100 per c mm., 15,730 of which were polymorphs, and the sputum contained coagulase positive *Staphylococcus pyogenes*, insensitive to penicillin. He responded well to a course of sulphamezathine and streptomycin, and the signs in the chest gradually disappeared

To my surprise routine radiological examination of the chest during convalescence showed a large rounded opacity in the right lower lobe (see figure) Bronchoscopy, blood count, blood sedimentation rate, blood Wassermann and Kahn reactions, Casoni test, and repeated sputum examination gave negative results, and by early February he was up and about in the ward and began to put on weight As the opacity persisted he was referred to a chest unit early in April It was thought that the mass in the right lower chest was a coincidental finding unrelated to the staphylococcal pneumonia, and the possibility of gastrogenous cyst or neurofibroma was considered

The patient continued to remain well, without any signs in the chest, and serial radiographs from April to August showed gradual diminution in the area of opacity, a bronchogram suggested that the cause was extrapulmonary In August the patient was transferred to the same chest unit, where a right lower lobectomy was performed The pathologist's report on the specimen was as follows "Specimen consisted of the whole right lower lobe Beneath a plaque of pleural thickening was a cavity with thick fibrous tissue walls, lined by granulation tissue No evidence of neoplasm or tuberculosis microscopically"



A B

A anteroposterior view and B lateral view, showing round mass in the lower zone of the right lung

Postoperative recovery was uneventful and the patient remains well

St Nicholas' Hospital, London S E 18 S KARAVI

ST PAUL'S CRAY APPOINTMENTS

SIR,—The two paragraphs which Miss Hornsby Smith quotes from *Hansard* in her letter of Dec. 9 contain several inaccuracies and show how badly informed she was when she made her statement in the House of Commons

Miss Hornsby Smith writes that she never alleged that the L C C had appointed us to our practices According to *Hansard* she actually said "I am raising on the Adjournment the method of appointing doctors to the London County Council estate area known as St Paul's Cray the L C C by deciding which doctors should be allocated a house from which they can practise are choosing the doctors on this estate." Later, in reply to Members who found it as difficult as we do to know what was her complaint, she stated "I made the accusation against the London County Council that is the purpose of raising the matter on the Adjournment"

Since that was her purpose, it is surprising that she mentioned the names of two doctors who have no connection with the L C C, and failed to mention other doctors who have also started practising in the area and of whose existence she must surely have learned during her discussion with "the secretary of the local Medical Practices Committee" (presumably she meant the secretary of the Local Medical Committee) Referring to us Miss Hornsby Smith said "I first had shoals of protests about these gentlemen and that gave rise to my investigating [the matter]" We wonder why she has not disclosed from whom she received these shoals

St Paul's Cray Orpington, Kent. L M FRANKLIN J D PAULETT R TEPPER E TUCKMAN

REVOLT AT KINGSTON

SIR,—I was glad to see that Dr Morgan had corrected (Dec 9) Dr Stark Murray's distorted version (Nov 2 of the happenings at Kingston

Dr Murray's antagonism to general practitioner hospitals appears to render him incapable of putting the facts fairly and honestly A good general practitioner service is as necessary for the community as any other part of the health service, and should be an integral part of it, coördinated, as far as possible, with the hospital and public health service It has long been recognised that the general practitioner will achieve a high standard of work if he has access to hospital Lord Webb-Johnson, president the Royal Society of Medicine, said Nov 22 that all engaged in the practice of medicine would deplore the present tendency whereby general practitioners were deprived opportunities which should be theirs at the local hospitals

But we do not want the general practitioner hospital as visualised, in his ignorance, by Dr Murray We want to retain the type general practitioner hospital exemplified the Kingston Victoria and Surbiton hospitals where the practitioner works in conjunction with a consultant and specialist staff, and able to learn what advances are being made see procedures carried out, and discuss cases with them in short, a hospital which will prevent him from being left medical isolation and help him keep his standard of medicine, and so make him more useful to the community T

called "revolt at Kingston" has aroused the interest of general practitioners all over the country, because they know the Kingston Victoria Hospital is fighting for an ideal, and they are all waiting to see whether the Minister of Health is going to stand by his recommendations on the matter of general practitioner hospitals which he issued last year to regional boards, or whether will continue to let the matter be settled by "planners" who have no knowledge of the aims and ideals of general practitioners

Gynæcological cases are not the only ones for which beds are urgently needed This manipulation of beds in the proposed scheme is only robbing Peter to pay Paul, and it is open to question whether this is for the benefit of the community.

RALPH G SMITH
Chairman Kingston Division
British Medical Association
Tolworth Surbiton Surrey

FLAME PHOTOMETRY

SIR,—The article by Dr Spencer in your issue of Nov 25 will have left many readers with the confused feeling that flame photometry, though doubtless a very convenient and rapid method of estimating certain electrolytes, is hardly suitable for use in a routine laboratory, owing to the complexity of the apparatus and the numerous possible sources of error In fact, however, for ordinary clinical purposes, flame photometry can be carried out with quite simple equipment which can be designed to eliminate many of the sources of error mentioned by Dr Spencer, while some of the other sources are in fact of very little real significance For instance, Dr Spencer's figures for the effect of urea show that the amount present in undiluted urine would produce less than 2% error, and urine is usually diluted 1/100 before use

The main means by which a flame photometer can be simplified and rendered less liable to error is by modifying the design of the atomiser and burner Dr Spencer is quite correct in saying that the design of the atomiser is critical, but his brief account and illustration of various possible types does not shed much light on the subject Essentially, atomisation is produced by feeding liquid into a high velocity gas stream, and, other things being equal, the higher the velocity of the gas stream the finer the droplets produced, and the larger the proportion of the liquid therefore made available for feeding into the flame

The use of coal gas is unsatisfactory for two reasons if taken direct from the main, the pressure is liable to sudden small variations which make direct photometry, as Dr Spencer rightly says, unreliable (pressure stabilising devices are available but they increase the complexity of the apparatus), secondly, the pressure of the gas is insufficient to produce atomisation, and compressed air must therefore be used for the purpose Most institutions where compressed air is available on the bench employ a pressure of between 5 and 10 lb per sq in., which does not produce efficient atomisation It is therefore necessary to use either a blower, which is usually noisy, or a cylinder of compressed air, when the stability of the photometer depends on the efficiency of the reducing valve employed Both these disadvantages can be overcome, and the atomiser and burner combined into a single unit, by using a gas such as butane, which can be stored as a liquid with a vapour-pressure of 30 lb per sq in at room temperature This pressure is amply sufficient to give a gas velocity which will produce efficient atomisation and it will vary only slowly with changes of temperature of the cylinder The atomiser can be made an integral part of the burner, and the jet will then draw in sufficient air for complete combustion

Another disadvantage of the system suggested by Dr Spencer is that it not only uses solution at an excessive rate, but also wastes it, in that once the funnel is filled it must be emptied before the solution can be changed An atomiser such as that shown in his fig 2A can be designed to be as efficient as any other, and if the dead space is kept small no solution will be wasted By using a single gas at a practically constant pressure not liable to sudden changes, all adjustments and flowmeters can be eliminated, and the stability of the system is such that the "direct" types of photometry can be used with confidence to give all the accuracy necessary in routine clinical work. The optical and electrical system can thereby be much simplified, so that the overall simplification of the apparatus is very great indeed

If flame photometry is ever to graduate from the research laboratory to its proper place in routine clinical work, more attention must be directed to simplification and less to elaborate devices designed to avoid relatively unimportant errors

Medical Research Council
Pneumoconiosis Research Unit
Llandough Hospital Penarth Glam
B M. WRIGHT

MASS RADIOGRAPHY

SIR,—Your leading article of Dec 9 states "It takes time to learn to handle a new tool, even when we are guided by experts When the tool itself is new there are no experts" And it concludes with "These considerations all suggest that we are trying to use mass radiography in the wrong way" May I point out that "the tool" (the X-ray unit) had many experts before and at the time of the introduction of this less efficient mass producing unit, in proof of which it may be pointed out that, before the introduction of this very expensive mass radiography scheme, a criticism was published[1] containing all the points made by your leading article, and precisely the same conclusion, but stated in the more forcible words of Wilfred Trotter That criticism was refused by various medical journals, and all the symposia presented since that time (except one in the *Post graduate Medical Journal* of May, 1944) have excluded any critical contribution

The figures quoted by Dr Peter Kerley in support of mass radiography, to the effect that tuberculosis patients picked up by this means stayed on an average 6–7 months in hospital and there were but three deaths amongst them, whereas in a comparable control group—presumably cases with signs and symptoms notified by general practitioners—the average stay in hospital was 18 months and there were many more deaths, are open to criticism In Birmingham (where the mass radiography unit is under the direction of Dr Halliday Sutherland) we have picked up patients with the radiographic signs of early pulmonary tuberculosis and seen these signs completely disappear within 3–6 months, and we have seen very many cases, as indeed Dr Kerley must have done, with radiographic evidence of extensive disease which has healed without the patient having been aware of its presence These patients have not been given the expulsive stigma of tuberculosis, nor have they needlessly occupied sanatoria beds

Patients with signs and symptoms notified by the general practitioner, and found to have extensive disease which proves fatal in spite of all chest hospital activities are patients whom we know from experience would a few months before probably have proved negative to any radiography That some chronic cases are missed we are well aware, they form the small proportion of patients with recurrent signs of bronchitis who do show definite radiographic evidence of tuberculosis, but this is one of the groups for which I have advised the economical use of mass radiography

The suggestion by Dr Owen Clarke (Dec 9) that 4 × 5 in film should be used instead of 35 mm film

1 *Medical World* Sept 11 1942 p 77

for mass radiography or the full sized film for general clinical medicine (which is assuming mass numbers) is neither economical nor sound It is still a photograph of the screen image, and its doubtful superiority over the 35 mm film does not economically warrant its manufacture or use For general clinical medicine its substitution for the direct radiograph as an economical measure would not yield the additional benefits which could be gained from more careful clinical selection of cases for radiography

Mass radiography has a use in selected groups, as I have shown, but unfortunately it has fostered the erroneous teaching that progressive disease is symptomless, and the bad habit of radiography prior to adequate clinical examination—the cart before the horse—which so blinds the observer that the course, which might otherwise have been clear, is now rendered hazardous and even dangerous to the patient

Edgbaston Birmingham JAMES F BRAILSFORD

*** Our leading article should have given credit to Dr Brailsford for the opinions he has persistently expressed in our columns from 1941 onwards —ED L

SIR,—Dr Hoffstaedt's article raises many issues

There is no doubt that mass radiography is still in an evolutionary stage, seeking the most efficient methods for the discovery of symptomless tuberculosis It is thus understandable that some units (as Dr Hoffstaedt shows) have a small turnover, while others reach a figure of 50,000 or more examinations per year

One could question the advisability of using a mobile unit for cases referred by general practitioners, for contacts, or for antenatal cases These groups are probably better served by static units

Dr Hoffstaedt's, perhaps unintentional, assessment of the merits of this relatively new method in terms of "investment and dividends" cannot be allowed to pass without comment Once doctors start on financial calculations in relation to man and his welfare, there is no end to the possibilities Millions of people derive a distinct sense of well being from the knowledge that they are, for the moment at least, free from a disease they dread, they are grateful to mass radiography I doubt whether this knowledge can be too expensive for an increasingly tuberculosis conscious population Let us ask the public, who pay for it

G Z BRETT
Physician in-charge
Mass Radiography Units North West
London W 9 Metropolitan Regional Hospital Board

SIR,—In his article of Dec 9, Dr Hoffstaedt produces some very interesting figures relating to the cost of mass radiography surveys It appears to us, however, that his article is open to a certain amount of criticism

In the first place, we feel that region no 1 cannot be using its mass radiography units on the most economical basis Dr Hoffstaedt says that over a period of 2½ months 2315 volunteers were examined by one unit from an area with an adult population of 53,790 That it should take a unit 10 weeks to radiograph 2000 odd individuals requires some explanation During an 8 week period our own unit, doing a similar type of survey covering approximately the same adult population, radiographed 10,200 volunteers, and this survey included large films and clinical examinations During this time the mobile unit moved seven times to various factories, school clinics, and so on The target for one mobile unit should be at least 35 000–40 000 examinations per annum, and in many cases this figure can be considerably exceeded

In "suggested uses for mass radiography Dr Hoffstaedt has included dusty occupations such as mining sand blasting and steel dressing The use of a miniature set for this type of work is perhaps open to objection The Pneumoconiosis Research Unit, for instance, uses microphotography for the non mining population of the Rhondda Fach Valley whereas the mining population is being radiographed on full sized films

Dr Hoffstaedt also proposes that school leavers should one of the main groups for examination This group recognised as having the lowest incidence of tuberculosis discovered in any surveys, and we suggest that it is far more important to examine these individuals after they have been in industry for a year or two

As used at present, mass radiography is essentially a chest service in which all abnormalities discovered are dealt with, this includes both pulmonary and cardiac abnormalities

If it were wished to really cheapen this service, the following action would be necessary

The service would have to be regarded purely as a screen for pulmonary tuberculosis, taking miniature films and reporting films of 4 × 5 in size The staff could then be reduced to radiographer, assistant radiographer, dark room technician, and two clerks, clerical work would be cut down to an irreducible minimum and all cases immediately referred to a chest clinic The post of medical director would be abandoned, and a consultant chest physician would attend for two or three half sessions per week to read the miniature and large films All surveys would be arranged by a secretary under the direction of the consultant chest physician.

These measures would greatly lessen the cost of running mass radiography in this country Whether this is advisable at present is, however, questionable

A G EVANS
Medical Director
E POSNER
Assistant Medical Director
Keresley near Coventry Mass Chest Radiography Centre

PAY IN THE FORCES

SIR,—In your annotation of Dec 9, you draw attention to the discrepancy between specialist pay in the National Health Service and in the Armed Forces An even more anomalous position will arise in the event of mobilisation, when a consultant employed on a "" basis and doing domiciliary visits may be earning £31 exclusive of private work, and in addition may be receiving a merit award of another £500 or £1500 On mobilisation his salary for service away from his family and paid from the same ultimate source will drop, even as a lieut colonel with specialist pay, to about £1330 In the present state of international unrest, should no this situation be faced as a matter of urgency ?

G D KERSLEY
Bath Colonel A.M.S (T A)

MYXŒDEMA FROM RESORCINOL OINTMENT

SIR,—The failure of Dr Klein and his colleagues to produce goitres in rabbits treated with resorcinol, reported in their letter of Dec 9, may have been due to the method of administration

After subcutaneous injection the drug is very rapidly absorbed, metabolised, and excreted Thus, assuming that one injection per day was given, their rabbits' thyroids may well have been free of influence from the drug for 20 out of the daily 24 hours This is in striking contrast to methylthiouracil, much of which is retained both concentrated in the thyroid and bound to the plasma proteins The cases of myxœdema reported by Bull and Fraser[1] presumably had a blood level of resorcinol maintained by continued absorption from the ointment applied to the varicose ulcers The anti thyroid activity was demonstrated by Doniach and Fraser[2] in rats killed up to 2½ hours after subcutaneous injection of the resorcinol This short period was chosen purposely because of the expected rapid metabolism and excretion of the drug

The production of goitres by resorcinol in animals will almost certainly require a long course of frequent subcutaneous injections or skin inunctions, repeated as many times during the day as is required to maintain

1 Bull G M Fraser R Lancet 1950 1 851
2 Doniach I Fraser R Ibid p 85

anti thyroid level of the drug in the blood An periment of this type has recently been started at e Postgraduate School A small number of rats are ceiving twice daily skin inunctions of resorcinol ntment to see if they develop goitres

It is, however, relevant that all our patients had a oitre and myxœdema, both of which subsided on ithdrawal of the resorcinol

Postgraduate Medical School of London W 12 I DONIACH
RUSSELL FRASER

Obituary

GEORGE HUGH CULVERWELL

O.B.E., B.A. M.D DUBL D P H

Dr Culverwell, chief inspector to the Home Office under the Cruelty to Animals Act died on Dec 9

He was a graduate of Trinity College, Dublin, where he obtained Stewart scholarship the Purser medal and the medal of the Dublin University Biological Association before he took his M.B in 1913 During the 1914–18 war he held a commission as major in the R.A.M.C., and on demobilisation he was for a time an assistant medical inspector of schools for Berkshire This work led to his appointment to the children s branch of the Home Office In 1925 he published a paper on Feeding in Home Office Schools based on his work as inspector of reformatories and industrial schools

G S M writes 'The Cruelty to Animals Act, for which Culverwell was chief inspector under the Home Office, became law more than 70 years ago and since there has never been a prosecution completed under the Act no case-law on experiments on living animals exists The proper administration of the Act therefore calls for high qualities of understanding and clarity of thought of medical and scientific knowledge and experience and of ability to discriminate between the letter and the spirit In all of these Culverwell excelled He had a prodigious memory, and the mental quality that so often accompanies that attribute forced him to spend himself to the uttermost His death is a challenge to the common belief that no man ever died of too much work for he was never, at least in recent years, a man of robust health and there can be no doubt that had he taken his duties more lightly he might well have survived to enjoy the retirement for which his many avocations promised so well"

Births, Marriages, and Deaths

BIRTHS

KINNEAR—On Dec. 8 at Wickham Hants the wife of Dr J D Kinnear—a son
ROWLEY—On Dec. 8 the wife of Dr K A Rowley—a son
TALBOT—On Dec 9 the wife of Dr J C Talbot—a son

MARRIAGES

MACWATT—WATTS—On Dec 8 at Montreal David MacWatt M.B. to Freda Vernon Watts
SHEBOTHAM—JEFFERIES—On Dec 2 at Wilmslow Robert Noël Sidebotham M.B to Patricia Mary Jefferies M.C.S.P

DEATHS

BABINGTON—On Dec. 10 at Margate James William Herbert Babington M.D Edin major I.M.S retd
CULVERWELL—On Dec 9 George Hugh Culverwell O.B.E. M.D Dubl., D.P.H.
GALLOWAY—On Dec. 9 at Salcombe Hill Sidmouth Andrew Fleming Galloway M.D Glasg
KNOCK—On Nov 29 killed in action in Korea Douglas Alexander Knock, M.B Lond. surgeon lieutenant R N aged 27
KYFFIN—On Dec. 13 John Kyffin M R C.S aged 84
LOWE—On Dec. 13 in Alexandria Egypt John Russell Lowe M.B. Dubl aged 27
MACCORMAC—On Dec. 12 in London Henry MacCormac C.B.E M.D Edin F.R.C.P
MUIR—On Dec. 9 at Marley Exmouth John Muir O.B.E. M.B. Glasg
THOMAS—On Dec. 11 at Welshpool Montgomeryshire Richard David Thomas L.R.C.P.E aged 84
WAINWRIGHT—On Dec. 10 George Bertram Wainwright O.B E. M.B. Camb
WILLMORE—On Dec. 8 in London James Graham Willmore O.B.E., M.D McGill M.R.C.P

Notes and News

TUBERCULOSIS RESEARCH

In its latest annual report the research committee of the British Tuberculosis Association outlines investigations which are continuing or are being initiated, often in conjunction with other bodies These include a study of the most favourable type of case for treatment with thiosemicarbazone, an investigation into the incidence and nature of tuberculous tracheobronchitis in this country a survey of histoplasmosis, a controlled trial to determine the value of streptomycin in tuberculous endometritis and a small investigation to determine the persistence of allergy after B C G vaccination The committee has so far sought mainly to provide a sorting house for ideas but it hopes that interested organisations or individuals will contribute money for research grants The hon secretaries are Dr J V Hurford, King George V Sanatorium Godalming and Dr Maher Loughnan, Colindale Hospital London N W 9 and the hon treasurer is Dr G S Todd King Edward VII Sanatorium Midhurst

ABBREVIATIONS

With his index of abbreviations used in English, French German Spanish Italian Danish and Swedish medical publications Alfred Peyser[1] tries to release the reader bogged down in a morass of initials Between the multilingual prefaces and the index proper is a separate explanation of abbreviations used in the text from this it is surprising to learn that 'stet' means nomenclatura stethoscopica internationalis 1913 A work of this sort is bound to be uneven but it is strange to find that though A.I.D is defined (as 'Artificial Insemination Donator) A.I.H is omitted The range of the index may be illustrated by A.L W (arch loop whorl of Galton s finger print system) and S H.M O

A CRITIC OF EDUCATION

It has been well said that the hardest thing a man is called upon to do is to think Sir Sheldon Dudley[2] feels that our present educational system does not give the potential thinker much help He regards it as a very complicated and expensive system giving barren results And why is this so? Largely because the rewards of the teaching profession are so low the right men and women are available but not at the price paid to a manual labourer In the course of his book Sir Sheldon deals with the vagaries of the herd instinct in human affairs with suggestion and auto suggestion, and with the changes in the values of words as symbols He at least is playing his part in provoking thought

A PORTABLE AUDIOMETER

Even slightly impaired hearing is a serious handicap, and may cause a child of normal capacity to seem backward at school In industry, too the worker with impaired hearing may be at a disadvantage and can often work better if his disability is recognised and corrected with a hearing-aid Testing for such partial deafness with a pure-tone audiometer is now the accepted method, and Messrs Amplivox[3] have lately produced a convenient portable audiometer (their model 70) which should be useful to school doctors and industrial medical officers The instrument will work on either A C or D C mains and incorporates a voltage regulator which automatically compensates for mains voltage variation Moreover it is neat and convenient and weighs only 14lb It allows for air-conduction testing at 8 pure tones with frequencies of 125–8000 cycles per sec and with a maximum intensity range of 100 decibels, in 5-decibel steps Since there is a single zero reference the same figures are read on the hearing loss scale for all frequencies so it is possible, by setting the hearing loss dial at 15 or 20 decibels and checking the desired frequencies in quick succession to spot any child who cannot hear each at the chosen intensity above the normal hearing threshold The calibration is said to be extremely accurate all tolerances being within the requirements published by the Medical Research Council and the American Medical Association The instrument is provided

1 Pars pro Toto Breviarum Medicum Internationale Stockholm Almqvist & Wiksell 1950 Pp 196
2 The Four Pillars of Wisdom *a Rational Approach to a Healthy Education* By Sir SHELDON DUDLEY K.C.B. F.R.S medical director general Royal Navy 1941–46 London C A Watts. 1950 Pp 243 5s 6d.
3 Amplivox Ltd 2 Bentinck-street, London W 1

with one genuine and one dummy earphone, mounted on a headband; these, with the mains lead, pack into a lock up compartment in the audiometer when not in use A draw back to the instrument is that it has not the full range of frequencies and cannot be used to test for bone conduction Messrs Amplivox were among the first firms to produce an audiometer in this country, and their larger model is one of the best instruments of the kind now made in the world at a competitive price However, this smaller model (which costs 80 guineas) will clearly serve a useful purpose, and is welcome

Their latest hearing aid (model KA, Amplivox) like most other modern aids of the same type has automatic volume compression, which is specially useful to patients with perceptive deafness and low noise tolerance

University of Cambridge

On Dec 2 the following degrees were conferred

M.A—Frank Howarth Oswald Lloyd

M D—Peter Sainsbury G M Fleming, W L Calnan Harry Butler

M B B Chir—*Ion Dan Edeleanu

*By proxy

University of London

At a recent examination for the D.P M, the following were successful

J A Ardis, Laura M Barlow, A S Clark R A Cohen R B Davis J R E Dobson, Omar Elgarem Alick Elithorn Walter Fabisch, Leslie Ford G J Goldberg J T Hutchinson, W A MacIlrath H E S Marshall, J K W Morrice B J Phillips R M Phillips Harry Pozner A A Robin Ernst Rosenthal Theodore Schlicht, R D Scott D B Stone, D L C Thomas W L Tonge John Towers W H Trethowan H de B Warren C H A Wedeles A C Woodmansey T A. Wylie

The following have been recognised as teachers of the university in the faculty of medicine in the subjects indicated

Mr A L Abel Mr S O Aylett and Mr David Levi surgery Mr A. B Evans obstetrics and gynæcology Dr R J Jarman anæsthetics Dr J L Lovibond medicine all at Westminster Medical School Miss Josephine Barnes obstetrics and gynæcology, Dr Helen Dimsdale medicine Mr H D Johnson surgery Royal Free Hospital Dr W S Feldburg F R.S, physiology and pharmacology National Institute for Medical Research Mr A J Heriot, surgery King s College Hospital, Dr J W Litchfield medicine Dr Ernst Neumark pathology St Mary s Hospital Dr F D Howitt physical medicine Middlesex Hospital Sir Paul Mallinson mental diseases St George s Hospital

Royal College of Surgeons of England

At a meeting held on Dec 14, with Prof Ernest Finch, the vice president, in the chair, the council received from Viscount Nuffield a portrait of himself by John Wheatley, A.R.A

Mr R Marnham was admitted to the court of examiners

Professor Finch was appointed Bradshaw lecturer and Mr W R Le Fanu Thomas Vicary lecturer for 1951

Diplomas of fellowship were awarded to the following

J H Armstrong †W M Owen *J H Dobree, J G Jamieson, *C A Cook G D Cribb L C L Gonet O C Fung Alexander Katz P H Tasker, B J Fowler *H N Reed M R. Thompson *E C Glover, J W F Richardson †J T M C Jenkins R T Routledge †J C Ballantyne A J Partridge *E S Perkins, J K Wright H H Bentall †L G Kingdom C W S F Manning W K. Douglas J R Moffat, C R M Redwood M B Devas W E J Bennett, L S A. Boothroyd R W L Hurt P S London E L Trickey W A Ashford Hodges Kenneth Owen R H Shephard D E E Jones Declan O Keeffe, W H Davies A R Calo C J L Misso A T Watson †P R Das Gupta M A Abdallah A I L MacDiarmid R T Burkitt T S Jairam T A R Dinning, Raymond Dobson A H Foate, W B N Bomford H N Burwell T L Carr, †S L Citron *C E A Cragg J E M Dutton J H Johnston B K Mukherji †Vaitialingam Rasanayagam A J Spence *W M. Walker D S Eldin J W Graham C R Helsby, R S B Hudson J B Lynch I A McGregor †Asghar Nizami, I F Potts W J W Sharrard Joseph Siegler Martin Singer J C Taylor, G T Watts H J Wright, G R Anderson G S Gunter D G Hurley, J W Jackson, P G Jones C R Neve James Oldfield T P S Powell †H J Shaw T V Simpson W N Gilmour R P Hewitson E M. Kupfer Wendy E Lewington J K Madan †J H Seymour C J Windsor John Crossley, O R Nicholson K. C Mahajan

*In Ophthalmology †In Otolaryngology

Faculty of Anæsthetists The following were elected to the fellowship M H Davison, F K. Boston, C H Budd, M C

Lebanon Hospital for Mental Diseases

At the recent jubilee celebrations of this hospital at Asfuriyeh, Dr W M Ford Robertson, the medical director, and Dr Amin Khairallah and Dr Joseph Hitti, members of the local executive committee, received from the President of the Republic the golden medal of the Lebanese Order of Merit A new admission pavilion was opened Dr J R Sawle Thomas attended the celebrations on behalf of the London general committee, and lectured in Beirut and Tripoli on psychiatric care under the British National Health Service

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held recently with Prof. Hilda Lloyd, the president, in the chair, Mr Geoffrey Keynes and Dr R J Minnitt were admitted to the fellowship Lever hulme scholarships were awarded to Mr L W Cox, F.R.C.S., Dr J C McClure Browne, and Dr D C A Bevis.

The following candidates from Australia and New Zealand were elected to the membership

Lois E Benson A D Byrne Michael Connaughton. E. W Duncan J M Farrar F G Favaloro, R C Gordon, A M B Grant G H Green W R D Griffiths A L Hellestrand R E Hemsley T D Hollywood W G Jasper A R Long R H Macdonald Ella A N Macknight L O S Poidevin N H W Saxby, J R Sherwin W L Sloss K F Tarlinton, H R Thomson Helen R Thomson, T W Vorrath Marjorie R Walker Alice Wheildon.

The following candidates from New Zealand were awarded the diploma in obstetrics

T J Buckley, R R Grigor, R G Gudex, G C Liggins, Diana Montgomery R A Warren

London District Nursing Associations

The Central Council for District Nursing in London has compiled a list of the associations in the Metropolitan Police area Copies may be obtained from the council, 25, Cockspur Street, S W 1

Temporary Residents

The Minister of Health has decided, after consultation with the General Medical Services Committee, that fees shall be paid to general practitioners in respect of temporary residents only where treatment has actually been given

Future of the Tuberculosis Service

The public health section of the Royal College of Nursing is holding a conference on this subject on Saturday, Jan. 13, at 2 15 P M at the college, Henrietta Place, London W 1 Dr Philip Ellman will be in the chair, and Dr G E Godber will speak Those who wish to attend should write to the secretary of the section before Jan 6

Army Medical Exercise

Last week representatives of the army medical services of the British Commonwealth and the Western Union countries together with those of the U S A, Norway, Denmark, and Italy, attended a medical exercise at the Army School of Health, Mytchett, near Aldershot The purpose was to discuss problems arising from exercise 'Horatius' held last May at Camberley

Heberden Society

At the annual general meeting of this society on Dec 8 and 9, Sir Henry Cohen was elected president for 1951, with Lord Horder as president-elect Papers were read by Prof E C Dodds, F.R S, and Dr Peter Bishop on Endocrine Aspects of the Rheumatic Diseases, Dr Françon (Aix les Bains and Paris) on Psoriatic Arthritis, Dr James Reid on Salicylates in Rheumatic Fever, Dr Francis Bach on Splenectomy in Rheumatoid Arthritis, Dr R M Mason on Familial Ankylosing Spondylitis, and Dr C J M Clark on Psychological Factors in the Treatment of Rheumatoid Arthritis Prof E C Kendall will give the Heberden oration in 1951

Appointments

ADDIS H ST C C, M.B Camb, M.R C.P tuberculosis physician Salford Lancs

BROWN D J A M B Lond D.A consultant anæsthetist Bury and Rossendale group of hospitals

BURBIDGE H C jun M R C.S D A anæsthetist hospitals of Banbury and district and Wingfield Morris Orthopædic Hospital

CLAYTON, R B, M R.C.S D A consultant anæsthetist Aylesbury and High Wycombe groups of hospitals

CULBERT T D M B Edin D A senior consultant anæsthetist Manchester Babies and Children s group of hospitals and North Manchester group of general hospitals

DAWSON J S, M B Glasg asst psychiatrist Hartwood Mental Hospital Lanarks

DOLTON E G M B Lond, F R C.S thoracic surgeon Stoke-on Trent group of hospitals

JACKSON E S M B Edin appointed factory doctor, Carnforth district Lancs

JONES I D jun M.B Lond D A anæsthetist, hospitals of Banbury and district and Wingfield Morris Orthopædic Hospital

LEE WILLIAM M B Leeds consultant chest physician I c. area including Salford and two health divisions of Lancs

MCADAM WILLIAM M D Glasg psychiatrist Crichton Royal Institution Dumfries

SEWARD E H M.A B M Oxfd D.A D OBST consultant anæsthetist Aylesbury and High Wycombe groups of hospitals

Hospital for Sick Children Great Ormond St, London

Orthopædic Registrars

CRONIN J D M B Lond F R C S

HAY B M M B N Z. F R.C.S

SURGICAL RELIEF OF CONGENITAL CYANOTIC HEART-DISEASE

LATE RESULTS IN 72 CASES

T HOLMES SELLORS
D.M, M.Ch. Oxfd, F R C S
THORACIC SURGEON, TO MIDDLESEX HOSPITAL, HAYFIELD HOSPITAL, AND THE LONDON CHEST HOSPITAL

J R BELCHER
M S Lond, F.R C S
FIRST ASSISTANT LONDON CHEST HOSPITAL AND MIDDLESEX HOSPITAL

THE introduction of the Blalock Taussig (1945) operation in the treatment of pulmonary stenosis marked the beginning of a new era in the handling of many cases of congenital cyanotic heart disease The original operation has been followed by modifications, such as those introduced by Potts et al (1946), and there have been alternative methods of approach by a direct attack on the pulmonary narrowing or on the valve, as initiated by Brock (1948, 1949) and Sellors (1948)

Results of the operation have been published in several articles, and the series now presented may illustrate some of the developments in this form of surgery. Under the general heading of congenital cyanotic disease, Fallot's tetralogy provides by far the greatest number of examples, tricuspid atresia, transposition of the great vessels, and pure pulmonary stenosis are also encountered but much less frequently

MATERIAL

This series consists of 72 cases in which operation was undertaken for the relief of the congenital cyanosis These patients have all been followed up for at least six months. 30 were males, and 42 were females, 49 were in the age group 5–15 years

At the start it was felt that the ideal age for surgery was between 5 and 15 years, and this we still feel is the most satisfactory age group, but younger children have been operated on without undue difficulty In patients over 20 the operation did not go so smoothly, but successful anastomoses were made in 6 patients over this age, the oldest being 35

The conditions for which operation was undertaken were

Typical Fallot's tetralogy	65
Situs inversus and Fallot's tetralogy	2
Transposition of great vessels	2
Tricuspid atresia	1
Pulmonary stenosis only	2
	72

Associated abnormalities were

Gross venous anomalies (e g, bilateral venæ cavæ)	8
Right-sided aortic arch	18
Chest wall deformity (absence of lowest segment of sternum)	19
Absent right pulmonary artery	1

At operation wherever possible, a note was made of site of stenosis as judged by direct palpation after the pericardium had been opened 20 patients were thought to have a valvular stenosis, and 45 an infundibular one In 42 cases there was an obvious post stenotic bulge in the common pulmonary trunk associated with unusually large right and left pulmonary vessels We had the impression that the shape of this post stenotic bulge was ovoid in the case of infundibular stenosis, but spherical beyond a valvular obstruction

SIGNS AND SYMPTOMS

Cyanosis—Two dominating features have been cyanosis and dyspnœa on exertion Of the 72 patients, 56 were cyanosed at, or very shortly after, birth, and all had cyanosis and respiratory distress in the first year of life The cyanosis was appreciable in all cases and extreme in some It was closely related to the degree of polycythæmia, but not to the extent of the disability, for it was noticeable, particularly in older patients, that the greater the cyanosis the greater was the exercise tolerance, per contra, two adult patients in whom disability was extreme were only slightly cyanosed

Dyspnœa and distress on exertion varied considerably in degree, extending from patients who were restricted to walking only 2–3 yards and had to be carried everywhere, to those who could walk slowly upstairs and even lead a normal though limited existence In older patients the disability had often varied during their life, it had tended to lessen, and if they attained the age of 20 they could usually undertake some sedentary occupation

Any classification of exercise tolerance is impracticable, because factors such as the speed of walking, the climate, and general health vary from patient to patient and from day to day However, within broad limits our cases could be grouped by the distance they could walk without rest, as follows

Less than 50 yards	21 cases
Less than 200 yards	29 ,,
Less than a mile	11 ,,
More than a mile	11 ,,

Squatting—Associated with dyspnœa on exertion was the tendency to adopt a characteristic squatting position which was present in 50 of our patients. Several of the adults had given up their earlier habit of squatting in favour of resting forward with their hands on their bent knees when they were out of breath

Central Nervous System—The general intelligence, we believe, was well up to average standards, two children having attained scholarships and the majority being bright and alert mentally However, 4 were definitely subnormal, though their deficiency might have been partly due to lack of education It must be admitted that the mentality of most of the children is abnormal owing to their unusual upbringing, as well as to their disability These cyanotic children are particularly precious to their parents, and, like other writers, we noted that on all occasions where possible, before and after operation, both parents attended with the child at the outpatient clinic Chronic cerebral anoxia probably contributed to their irritability and jumpiness, for, in spite of gross cardiorespiratory insufficiency, some children were unable to keep still during their waking hours Another common feature was shyness, and an almost pathognomonic coyness, which usually disappeared soon after operation

Clubbing of fingers of the characteristic "drumstick" pattern was present in all except 3, who showed arachnodactyly After successful surgery the clubbing started to diminish and in most cases the nail bed became loose and almost seemed to float on the terminal phalanx The maximum regression of clubbing took from nine months to a year to occur

Deformity of the chest was another frequent coincident feature in the series, and in 19 patients—i e, over a quarter of the total—the lowest piece of the sternum was absent This led to funnel chest in some cases, and to pigeon breast in others Bifid ribs and abnormalities in the spinal processes were also encountered

INVESTIGATIONS

The degree of polycythæmia was variable but the hæmoglobin, red-cell count, and packed cell volume were closely related, and any one of them could usually be predicted if either of the two others was known In more than half the cases the hæmoglobin was between

130 and 170% (highest 200%) The highest red cell count was 10,000,000 per c mm A platelet count was done in most cases, and it was found that this did not rise proportionately with the red cell count, and was with one exception within normal limits This is significant, since a high platelet count has been suggested as a possible cause of thrombosis in these patients In this series there was evidence of postoperative thrombosis on only two occasions The average oxygen saturation of the arterial blood was 66–71%

Detailed radiological investigations and electrocardiography, were undertaken in all patients, but with no findings different from those described by other workers The diagnosis was made on clinical grounds in most of the cases, and we now feel that cardio angiography and catheterisation of the heart should be reserved for patients in whom there is doubt or difficulty in establishing a diagnosis This is not to deny that these procedures are highly valuable, but we have found that most cases can be diagnosed by simpler clinical and radiological methods

TYPE OF OPERATION

The first 3 patients were operated on through a right anterior approach, the right subclavian artery and the right pulmonary artery being anastomosed on the lines of Blalock's original description Next we adopted a left posterolateral incision and implanted the left subclavian artery into the side of the left pulmonary artery This was done, whichever side the arch of the aorta was situated, on 62 occasions, but a similar right-sided approach was used in the 2 cases of situs inversus The operations for the 6 remaining patients included 2 pulmonary valvulotomies, 3 Pott's operations, and 1 right sided end to end pulmonary subclavian anastomosis In this last case the original left sided operation had failed for technical reasons this accounts for the total of 73 operations in 72 patients The original pulmonary valvulotomy has already been described (Sellors 1948), but the second, which ended fatally, was an attempted division of the valve through an incision in the dilated common pulmonary artery

Our policy has been to attempt an anastomotic operation in Fallot's tetralogy, but to define, if possible, the site of stenosis in case a more direct attack on the narrowed area or valve seemed necessary at a later date "Pure" pulmonary stenosis is undoubtedly best treated by valvulotomy

TECHNIQUE

The brief outlines of the usual anastomotic operation are as follows

The anæsthetic consists of small doses of thiopentone and curare with intratracheal gas and oxygen (ether and cyclopropane are not used) and to these agents are added a paravertebral block and incision infiltration with ½% procaine (without adrenaline) With the patient in the lateral position, the fourth rib is resected from the transverse process forwards to the anterior axillary line The lung is retracted and the pericardium injected with 2–4 ml of 2% procaine to reduce cardiac irritability The left pulmonary artery is sought and dissected free, after any overlying small and tortuous vessels have been secured The pericardium is next incised posterior to the phrenic nerve to allow the heart to be inspected and to free a greater length of pulmonary artery

The subclavian artery is next carefully isolated from its origin up to the apex of the pleural cavity, where it gives off internal mammary, vertebral, superior intercostal, and thyroid axis branches These or their variants are divided so that a good length of artery is available to be turned down over the aortic arch and approximated to the pulmonary artery Unexpected and abnormal branches are commonly encountered and must not be ignored A clamp is placed across the origin of the subclavian artery, and two control clamps of the Blalock pattern are used to occlude the proximal and distal ends of the pulmonary artery The adventitia is thoroughly removed from both vessels and an end to side junction made with an everting type of suture

The lumen of the subclavian artery controls the size of the anastomosis, assuming that there is little or no narrowing at the suture line, but we have found that an apparently small opening, say of 2 or 3 mm diameter in a small child has given a much better functional result than might have been expected The slight angulation of the subclavian artery over the aortic arch does not seem to interfere with the efficiency of the anastomosis, but with a right-sided arch and a left innominate artery the subclavian artery lies in a mechanically better position

COMPLICATIONS

There is no doubt that increasing experience and cooperation between the various members of the team contribute to improved results In our first 25 cases there were 6 deaths at or within a short time of operation but in the subsequent 68 cases (not all included in this series) there has been only 3 fatalities Similar observations have been made by other surgeons

The causes of the 9 operation deaths varied 2 patients died of cardiac irregularity in the early stages of the operation, 4 more died of probable heart failure within twenty-four hours (no more obvious cause could be found at necropsy) There was 1 death from thrombosis at the anastomotic line, and 1 from a clotted hæmothorax which produced gross mediastinal displacement In addition, there was 1 death three weeks after operation, thought to be due to cerebral thrombosis on the day that the child was due to return home

Complications on the whole were uncommon, but some of these were alarming Two patients both over 24 hrs large hæmorrhages of more than 6 pints shortly after operation These were almost certainly due to a tear in the suture line as the large pulmonary artery became distended A transfusion of blood and plasma was given immediately, but in one case the initial fall in blood pressure led to ischæmia in the left arm, whose main artery had been ligated The subsequent Volkmann's contracture made a corrective operation necessary The other serious complication occurred in the oldest patient, aged 35, whose lung was affected by tuberculosis, after operation a tension pneumothorax persisted for some days in spite of continuous aspiration and the temporary loss of lung function was followed by a slight hemiplegia presumably due to anoxia There was 1 case of pleural infection A transitory Horner's syndrome was observed in 16 patients The skin wound in general healed badly in comparison with those of other thoracotomies

RESULTS

Apart from these complications, the average post-operative convalescence was straightforward, and most of the children were discharged within 12–14 days with obvious clinical signs of improvement The increase in exercise tolerance was the most marked feature and dated from the time of operation, progressively improving up to a period of 3 or 4 months, and in some cases with further benefit up to 6 or 9 months

The cyanosis improved gradually after operation in most cases but often took from three to six months to reach its final level Again the degree of improvement of the cyanosis bore little relation to the extent of the decrease of the disability The reduction in polycythæmia was unpredictable, sometimes showing an early pronounced fall, and on other occasions altering only to a small extent over the first few months The heart increased in size slightly as the left ventricle enlarged but only in 3 cases has there been any considerable cardiac enlargement

In several patients a fever developed postoperatively which was unassociated with leucocytosis and often persisted for two or three weeks These children were unaffected by chemotherapy, and we could not find a cause in any of them for their persistent temperature

) patients returned (1 at three weeks and 1 at seven postoperatively) with signs of cardiac failure ited with fever and tachycardia In neither could ablish a diagnosis of infective endocarditis despite ed blood culture but in both of them the fever ded to penicillin and the signs of cardiac failure eared. One of these patients had a large peri l effusion This complication has also occurred other cases but the effusion eventually cleared etely in both

patient (a woman of 22, weighing 16 stone), who ously cyanosed before operation and had a marked erative increase in exercise tolerance, died sud over a year later Post mortem no cause of her could be discovered The heart showed a typical tetralogy with a patent adequate anastomosis had, however, had two previous attacks of unconsciousness from which she had recovered etely

accurate classification of the end results is impric), because there are too many variable factors considered All the patients and the parents t psychologically from the operation, and improve has to be judged from the base line of the original lity We have regarded a good result as one in a child has been able to take up ordinary school hort of violent exercise, or in which an adult can his or her own living in a normal manner Two en are particularly worthy of mention—one who d football and was getting into trouble for fighting, nother who failed to attend outpatients as it was ay of his school sports where he ran (allegedly) ards in 12 seconds Several adults who worked in y or shop eight hours a day and found time to dance um have also been encountered In this category ave placed 42 patients An additional 22 were ded as being considerably benefited in that they much increased exercise tolerance but were still ssed on excessive exertion

the remaining 7 patients, 2 could not be expected ieft because the anastomosis was made erroneously ses of transposition of the great vessels The nder did not improve appreciably for reasons own but probably owing to inadequacy of the ial ductus However, the parents of one of the osition cases and of 2 others have expressed re in the physical improvement of their child, this may well be wishful thinking

at the future holds for these patients cannot be ined, but the early results have proved most ing If the artificial "ductus" does not give the l effect or maintain the improvement, an anasto on the opposite side, or a direct attack on the ed area, may still be considered

SUMMARY

eries of 93 patients have been operated on for ntal cyanotic heart disease There were 9 deaths uent upon the operation, but the mortality was tionately higher in the early cases than in the recent ones The majority of cases were examples lot's tetralogy

these patients, 72 have been followed up for six s or more The clinical features and investigations iefly described

technique adopted in most cases was the perance of a left end-to side Blalock type of anastomosis en the pulmonary and subclavian arteries using terolateral approach The pericardium was rou opened and the heart and site of the stenosis ined

end result as judged through periods ranging six months to two and a half years were gratifying ient died suddenly a year after operation, and 7 were regarded as not improved, but very marked benefit was obtained by 42 patients who were previously severely disabled, and a further 22 gained considerable benefit in exercise tolerance and general health.

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PULMONARY HYPERTENSION IN MITRAL STENOSIS

R I S BAYLISS
M A, M.D Camb, M.R C P
LECTURER IN MEDICINE POSTGRADUATE MEDICAL SCHOOL OF LONDON

M J ETHERIDGE
M D Melb, M R.A C P
PHYSICIAN TO OUTPATIENTS, ROYAL MELBOURNE HOSPITAL, MEDICAL REGISTRAR, POSTGRADUATE MEDICAL SCHOOL OF LONDON

A L HYMAN
M D Louisiana
PUBLIC HEALTH SERVICE RESEARCH FELLOW OF THE NATIONAL HEART INSTITUTE, U S.A.

From the Department of Medicine, Postgraduate Medical School of London Hammersmith Hospital

BEFORE direct measurement of the pressure in the pulmonary artery and right ventricle of patients with mitral stenosis was made possible by cardiac catheterisation, the state of the pulmonary circulation was deduced from indirect evidence Breathlessness on exertion, paroxysmal dyspnœa, hæmoptyses, accentuation of the pulmonary second sound, increased prominence of the pulmonary vascular shadows, dilatation of the pulmonary artery, enlargement of the right ventricle, and electrocardiographic changes were accepted as indicating increased pressure in the lesser circulation Renewed interest in the surgical treatment of mitral stenosis has made it advisable to determine how far these symptoms and signs are a reliable guide to the extent of pulmonary hypertension

The pressure in the pulmonary artery and right ventricle * of patients with mitral stenosis has been measured by a number of workers Bloomfield et al (1946) found increased right ventricular pressures in 5 patients with mitral stenosis, of whom 4, who had right sided failure or were just recovering from it, had pressures ranging from 85/16 to 103/29 mm Hg (upper limit of normal 30/4), in the 5th, who had never had right sided failure, there was a less pronounced rise of pressure (43/2 mm Hg) Few clinical details were given concerning these patients and no attempt made to correlate the physical findings with the pressure measurements Similarly Lagerlof and Werko (1949a) give few details of their 5 patients, 2 of whom had aortic incompetence in addition to mitral stenosis 2 patients were not in failure, the pulmonary artery pressure being normal in one and slightly elevated in the other, the other 3 had peripheral venous congestion with high pulmonary pressures Harken et al (1948, 1950) Bland and Sweet (1949), Bailey et al. (1950), and Baker et al (1950) report the right ventricular or pulmonary artery pressures in 17 patients selected for surgical relief of mitral stenosis Most were under 40, their symptoms were predominantly pulmonary, and only 5 had had systemic congestion Those with pulmonary

* The *systolic* pressures in the right ventricle and pulmonary artery are identical

TABLE I—FINDINGS IN 22 CASES OF MITRAL STENOSIS

Case no	Age (yr)	Sex	Lesion	Rhythm	Systemic venous congestion	Right ventricular pressure (mm Hg)			Pulmonary artery pressure (mm Hg)			Blood pressure (mm Hg)	Cardiac output (litres per min.)
						Systolic	Diastolic	Mean	Systolic	Diastolic	Mean		
1	28	F	M S A I	S R	—	17	0	9				120/70	6·9
2	49	F	M.S, A I	A F	—	17	4	10			21	130/90	2·6
3	37	F	M S	A F	—	24	1	8				110/78	3·4
4	50	F	M.S	A F	—	25	0	10	30	9	17	210/105	4·4
5	41	F	M S	A.F	—	29	0	14				125/85	3·5
6	58	F	M.S	A F	—	32	3	16				160/90	3·4
7	33	F	M.S T S, A I	S R	—	33	0	15	28	11	21	120/100	
8	48	F	M.S A I	A F	—	35	0	15				155/80	[illegible]
9	57	F	M.S	S R	—	35	0	16				106/62	4·4
10	52	F	M.S M I A I	A F	+	36	8	17	36	16	28	114/80	4·2
11	30	F	M S, A I	S R	—	38	4	20				120/70	5·0
12	43	M	M.S	A.F	+	41	4	19	38	23	30	120/85	3·3
13	49	F	M.S	A F	—	44	4	23				108/70	3·6
14	65	M	M.S	A F	+	46	11	23				170/85	3·2
15	32	M	M S	A F	—	53	6	23	53	26	35	123/76	5·6
16	32	F	M S M I A I	A F	—				54	29	42	134/90	3·8
17	45	F	M S	S.R	—	54	2	31	54	45	51	110/80	3·3
18	36	F	M.S A I, T I	A.F	+	66	15	32				120/70	3·0
19	46	F	M.S, A I	A F	+	92	10	30	92	35	55	150/90	3·1
20	26	M	M S	A.F	—	92	1	32	120	53	77	140/65	3·0
21	23	F	M.S	S R	—	92	9	44	82	55	68	110/75	
22	29	M	M S	S R	+	105	14	52				103/84	3·1

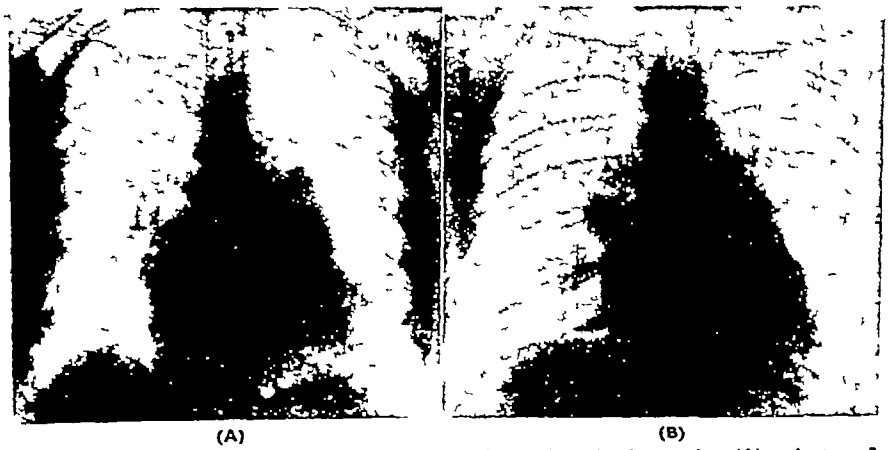
M.S = mitral stenosis M I = mitral incompetence T.S = tricuspid stenosis T I = tricuspid incompetence A I = aortic incompetence S R = sinus rhythm A.F = auricular fibrillation

symptoms only had markedly elevated pressures, which in 2 exceeded the systemic arterial pressure In addition to left atrial enlargement, many had an enlarged right ventricle with prominence of the conus region and often increased vascular markings The electrocardiogram usually showed right axis deviation or right ventricular hypertrophy, but no particular correlation was made between the radiological and electrocardiographic findings and the extent of pulmonary hypertension

Borden et al (1950) have correlated the pulmonary-artery pressure with the functional state of 30 patients with mitral stenosis, 10 of whom had aortic incompetence without significant enlargement of the left ventricle There was a rough direct correlation between the pressure and the patient's functional capacity Those who were partly or completely incapacitated by exertional dyspnœa usually had a high pulmonary-artery pressure and a 25% reduction in cardiac output On fluoroscopy patients with normal or slightly raised pressures had a normal cardiac shadow or straightening of the left border of the heart with left atrial enlargement Severe pulmonary hypertension was associated with enlargement of the pulmonary artery and right ventricle, and a reticular or finely mottled appearance of the lungs Although the left atrium was enlarged, there was no exact correlation between the size of this chamber and the extent of pulmonary hypertension

Hickam and Cargill (1948) have studied the effect of exercise on the cardiac output and mean pulmonary artery pressure in normal subjects and in patients with mitral stenosis In the former the cardiac output increased without any conspicuous rise in pulmonary artery pressure In the latter exercise produced a striking rise in pulmonary artery pressure with little or no increase in cardiac output Other workers have observed a similar response (Bland and Sweet 1949, Baker et al 1950, Harken et al 1950) The pulmonary artery pressure depends on the cardiac output and the resistance offered by the left atrium and the pulmonary vascular bed The rise in output without a proportionate increase in mean pulmonary artery pressure, which is found in normal subjects, must signify a corresponding decrease in resistance to blood flow through the lungs Observations by Hamilton et al (1939) in dogs and by Cournand (1947) in man suggest that this reduction in pulmonary resistance is due to the opening of new channels or the widening of those already open In mitral stenosis the rise in pressure without a corresponding rise in cardiac output must be due to an increase in pulmonary vascular resistance

Long standing mitral stenosis may cause sclerotic changes in the pulmonary vascular bed (Parker and Weiss 1936, Larrabee et al 1949), but how far these changes contribute to the rise in pulmonary artery pressure at rest and on exercise is not yet known



(A) (B)

Fig 1—Postero-anterior telerœntgenograms of 2 patients with mitral stenosis (A) patient no 3 (right ventricular pressure at rest 24/1 mm Hg) (B) patient no 22 (right ventricular pressure at rest 105/14 mm Hg) Both radiographs show marked prominence of the pulmonary artery and enlargement of the heart to right and left In (A) enlargement of the left atrium was evident from the double contour on the right border Although the resting ventricular pressure was normal in one patient and very high in the other there is no significant difference in the cardiac outlines.

METHODS AND MATERIAL

The pressure in the right ventricle or pulmonary artery was measured by the technique described previously (Bayliss et al 1950) We have used the right ventricular systolic pressure as a measure of the pulmonary artery systolic pressure, and agree with Bloomfield et al (1946) that the normal range is 18–30 mm Hg The slight difference between the pulmonary

artery and the right ventricular systolic pressure in an individual patient is due to normal fluctuations as the catheter is moved from the ventricle to the pulmonary artery The end diastolic ventricular pressure indicates the tension in the right ventricle just before contraction and closely parallels the right atrial pressure The normal end diastolic pressure seldom exceeds 4 mm Hg

The effect of exercise was studied in a number of cases The patient, remaining supine, carried out bicycling movements with his legs against manual resistance When a steady state was reached, the oxygen consumption was measured by a Douglas bag and Haldane gas analysis Immediately after the exercise samples of arterial and mixed venous blood were taken simultaneously, and the right ventricular or pulmonary artery pressure and the systemic arterial pressure recorded

Of 22 patients who were studied, 13 had involvement of the mitral valve only, 9 had, in addition to mitral stenosis, other valvular lesions which were not regarded as playing a major part in the hæmodynamic state Thus none of the patients with auscultatory evidence of aortic incompetence had peripheral signs of aortic reflux, although 5 (nos 2, 10, 16, 18, 19) had slight or moderate left ventricular enlargement on fluoroscopy One patient (no 4) had associated systemic hypertension, but this did not influence the pulmonary artery pressure, which was normal Brief clinical details of each case are given in an appendix †

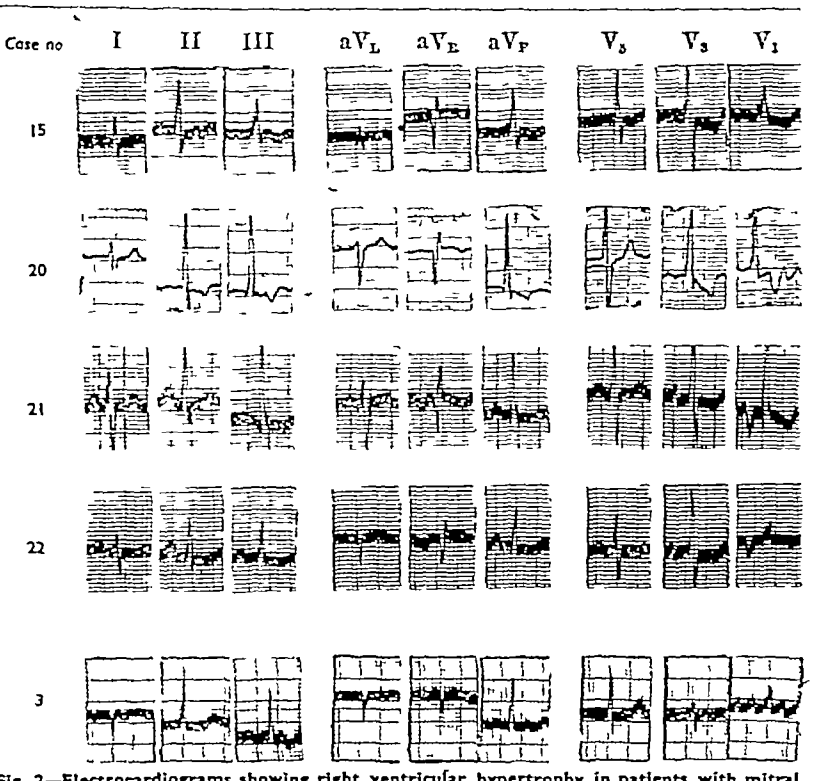


Fig 2—Electrocardiograms showing right ventricular hypertrophy in patients with mitral stenosis Patients nos. 15 20–22 had severe pulmonary hypertension at rest. Patient no 3 had a normal pressure at rest which rose to 85/13 mm Hg on exercise.

RESULTS

In table I the cases are arranged in ascending order of their right ventricular systolic pressure at rest In 5, pressures were within normal limits, in 17 there was pulmonary hypertension with systolic pressures ranging from 32 to 105 mm Hg

Relation of Clinical State to Pulmonary Pressure—There was some correlation between exercise tolerance and the pulmonary artery pressure, patients with normal systolic pressures usually being less incapacitated than those with raised pressures There were, however, several exceptions For instance, patient no 3 had a normal right ventricular pressure at rest of 24/1 mm Hg but was unable to do even light housework because of dyspnœa In contrast, patient no 16 had an increased pulmonary-artery pressure of 54/29 mm Hg but was able to do her housework except for heavy lifting

Of the 17 patients with pulmonary hypertension 11 had no evidence of peripheral venous congestion, although the hypertension was severe in 5, the pressure ranging from 53 to 92 mm Hg Of the remainder, 5 had obvious venous congestion with œdema at the time of observation, and the 6th (no 22) had engorged neck veins but no œdema, their pulmonary artery systolic pressures ranged from 36 to 105 mm Hg, and they all had an increased end diastolic right ventricular pressure in keeping with venous congestion

The 3 patients (nos 20–22) with the highest pulmonary pressures presented a distinctive clinical picture They were young, their symptoms were intense dyspnœa on slight exertion, orthopnœa, hæmoptyses, and episodes

† Multigraphed copies of this appendix are obtainable on application to THE LANCET office 7 Adam Street London W C 2

TABLE II—EFFECT OF EXERCISE ON THE CARDIAC OUTPUT AND PRESSURES IN THE RIGHT VENTRICLE OR PULMONARY ARTERY IN MITRAL STENOSIS

Case no	—	Right ventricular pressure (mm Hg)			Pulmonary-artery pressure (mm Hg)			Heart rate per min	Cardiac output (litres per min)
		Systolic	Diastolic	Mean	Systolic	Diastolic	Mean		
3	Rest	24	1	8				82	3 6
	Exercise	85	13	45				136	3 7
4	Rest	25	0	10	30	9	17	60	4·0
	Exercise				34	12	26	70	4·0
6	Rest	32	3	16				72	3 4
	Exercise	45	8	19				84	
11	Rest	38	4	20				91	5·0
	Exercise	56	7	29				100	
13	Rest	53	6	23	53	26	35	58	5·0
	Exercise	105	10	51	93*	46	61	145	6 2
16	Rest				54	29	42	90	3 6
	Exercise				90	43	62	120	4·0
18	Rest	54	2	31	54	45	51	112	3 8
	Exercise	78	3	43				140	3 1
20	Rest	92	1	32	120	53	77	70	3·6
	Exercise				105	84	97	140	3 5

* Following exercise pulmonary artery pressure was measured 4 min after right ventricular pressure

of so called "bronchitis" with copious frothy sputum Although peripheral venous congestion had occurred in 2 (nos 20, 22) it was transient and not a conspicuous feature of their illness Their condition deteriorated rapidly, and they died of pulmonary œdema within three years of the onset of symptoms Until the onset of symptoms they often had had remarkable effort tolerance

A further 5 patients (nos 15–19) had severe pulmonary hypertension of similar degree (53–92 mm Hg) One (no 15) was a young man with a short history of marked dyspnœa on exertion and of hæmoptyses, his clinical picture was similar to that seen in the patients with the foregoing pulmonary symptoms without conspicuous right sided failure 2 patients (nos 18, 19) had marked peripheral venous congestion and œdema at the time of observation The other 2 (nos 16, 17) were free of peripheral venous congestion, and although their main symptom was dyspnœa, they did not present the features of the pulmonary syndrome

There was no correlation between the duration of the patient's symptoms and the degree of pressure increase Thus patient no 5 had had several episodes of congestive failure in the last ten years but still had a normal pressure at rest, whereas patient no 20 had been free of symptoms until eighteen months before admission, and had a right ventricular pressure of 92/1 mm Hg Neither had peripheral venous congestion or œdema at the time of observation

Fluoroscopy—Left atrial enlargement was present in all patients except one (no 1), but there was no correlation between its extent and the degree of pulmonary hypertension The diagnosis of a significant degree of mitral incompetence was confirmed in 2 patients (nos 10, 16) by systolic expansion of the left atrium

Enlargement of the pulmonary artery was present in all patients (fig 1) Every patient with pulmonary hypertension at rest showed right ventricular enlargement, which was most marked in those with the highest pressures 2 patients (nos 3, 8) with normal or nearly normal pressures at rest also had conspicuous right ventricular enlargement

Electrocardiograms—In 17 of the 19 patients in whom the electrocardiographic position could be determined, the heart was in a vertical or semi vertical position with clockwise rotation There was no correlation between the presence of auricular fibrillation and the degree of pulmonary hypertension 7 patients had sinus rhythm, and, except for the patient with a normal pressure (no 1), all had wide and notched P waves There was a striking correlation between the presence of a very high pulmonary artery pressure and electrocardiographic evidence of right ventricular hypertrophy, using criteria based on the findings of Wilson et al (1941, 1947) The 4 patients with predominant pulmonary symptoms (nos 15, 20–22) all showed right ventricular hypertrophy (fig 2) One patient (no 3) with normal resting pressures also had right ventricular hypertrophy (fig 2), she had enlargement of the right ventricle on fluoroscopy, and her response to exercise is discussed below 3 exceptions with marked pulmonary hypertension (nos 16, 18, 19) did not show electrocardiographic evidence of right ventricular hypertrophy, their mitral stenosis was complicated by aortic incompetence with enlargement of both right and left ventricles

Response to Exercise—In contrast to normal subjects, in whom an increase in cardiac output occurs without a rise in pulmonary-artery pressure, all the patients who were exercised showed a significant increase in right-heart pressures (table II) The greatest increase occurred in patient no 3, in whom a normal resting right ventricular pressure rose to 85/13 mm Hg These increases in pulmonary vascular pressure were not accompanied by a significant rise in cardiac output or in systemic arterial blood-pressure It is clear therefore that this reaction resulted from an increase in pulmonary vascular resistance.

DISCUSSION

Clinical Recognition of Pulmonary Hypertension in Mitral Stenosis—It is apparent that in patients with mitral stenosis the pulmonary vascular pressures range from normal to very high, and that cardiac failure with peripheral venous congestion is associated with elevated pulmonary artery and right ventricular pressures. On the other hand, patients without congestive failure may have raised or normal pulmonary vascular pressures, and it is with this group that we are particularly concerned

The presence of *severe* pulmonary hypertension at rest can be diagnosed from the clinical findings The patients are usually in the third or fourth decade, and present a distinct syndrome characterised by episodes of acute pulmonary œdema, which may be precipitated by slight exertion or excitement Similar cases have been well described by Gallavardin (1921) and by McGinn and White (1934) Milder pulmonary congestion is characterised by episodes, lasting 2–4 weeks, in which there is increased dyspnœa on exertion, orthopnœa, cough with expectoration of frothy sputum and occasionally hæmoptyses Secondary infection, producing purulent sputum may follow, and the condition then simulates acute bronchitis Our patients died of pulmonary œdema within 2–3 years of the onset of symptoms, and peripheral venous congestion was not a conspicuous feature of the clinical course On fluoroscopy there was considerable enlargement of the right ventricle in addition to prominence of the pulmonary artery and left atrium There was also electrocardiographic evidence of right ventricular hypertrophy

Patients with normal or moderately raised pulmonary vascular pressures also had diminished exercise tolerance All had enlargement of the left atrium and pulmonary artery, but with one exception only those with pulmonary hypertension at rest had enlargement of the right ventricle In the exceptional case (no 3) whose exercise tolerance was much reduced, the right ventricular pressure was normal at rest, but there was right ventricular enlargement and electrocardiographic evidence of right ventricular hypertrophy Mild exercise caused a threefold rise in the right ventricular pressure, and perhaps therefore during her normal daily activity the patient usually had pulmonary hypertension. Thus a normal pressure at rest does not eliminate the possibility of pulmonary hypertension with ordinary activity

None of our patients with severe pulmonary hypertension had reticulation or mottling of the lungs. We have records of two patients, not included in this series, who had mitral stenosis and pulmonary hæmosiderosis Their *mean* pulmonary artery pressures were 25 and 29 mm Hg respectively (normal 15 mm Hg) They both gave a history of recurrent and often severe hæmoptyses over a period of nine years, but dyspnœa was minimal They did not have any of the other clinical features of patients with severe pulmonary hypertension

Mechanism of Pulmonary Hypertension—The primary factor responsible for the development of pulmonary hypertension in mitral stenosis is the mechanical obstruction offered by the diseased valve This is apparent from the narrowing of the valve orifice, the congestion of the pulmonary veins, and the histological changes found in the pulmonary capillaries Direct measurement at operation on patients with severe mitral stenosis has confirmed that the left atrial pressure may reach as high as 30–40 mm Hg (Bland and Sweet 1949) By passing a catheter through the right heart so as to occlude a distal branch of the pulmonary artery, Hellem

TABLE III—PULMONARY ARTERY AND PULMONARY CAPILLARY PRESSURES IN 5 CASES OF MITRAL STENOSIS

Case no	Mean pulmonary artery pressure (mm Hg)	Mean pulmonary capillary pressure (mm Hg)	Mean pulmonary artery/pulmonary capillary gradient (mm Hg)
Normal values	15	10	5
2	21	17	4
10	28	21	7
12	30	23	7
16	42	23	19
17	51	36	15

et al. (1948, 1949), and Hickam (1949a and b) have measured the pressure in the pulmonary "capillaries" of normal subjects, and shown in dogs and in man (with atrial septal defects) that this is closely parallel to the pressure in the left atrium The normal mean pulmonary "capillary" pressure by this technique is 10 mm Hg (range 7–15 mm Hg) In mitral stenosis Lagerlof and Werko (1949b) and Dexter et al (1950) report values ranging from 18–40 mm Hg—further evidence of the increased pressure in the left atrium and pulmonary veins

However, the anatomical factor alone cannot account for all the increase in pulmonary artery pressure, because (a) without a change in cardiac output the pressure rises on exercise, and (b) the presence or absence of failure may raise or lower the pressure, presumably without change in the size of the stenosed orifice (Bloomfield et al 1946, our own observations) In these circumstances there is an increase in pulmonary vascular resistance which is reversible

Dexter et al (1950) have shown that with lesser degrees of pulmonary hypertension the pulmonary artery pressure is increased in proportion to the pulmonary "capillary" pressure, and that the pressure gradient from the pulmonary artery to the pulmonary "capillaries" and the pulmonary arteriolar resistance are normal. This indicates that lesser degrees of pulmonary hypertension are due to the obstruction offered by the stenosed valve With more severe pulmonary hypertension, however, the pulmonary artery pressure is raised out of all proportion to the rise in pulmonary "capillary" pressure, indicating an increase in pulmonary arteriolar resistance Our own limited observations confirm these findings (table III) Thus it seems that increased pulmonary arteriolar resistance plays an important part in the development of *severe* hypertension in mitral stenosis This increased resistance may be due to pulmonary arteriolar vasoconstriction or to structural changes in the vessels Parker and Weiss (1936) have described in detail the histological changes in the lungs of patients with the clinical features of severe pulmonary hypertension In the 2 patients (nos 20, 22) in our series who came to autopsy and had severe pulmonary hypertension, hyperplastic sclerosis and intimal thickening was present in some of the pulmonary arteries and arterioles (fig 3), providing direct evidence of the possibility of structural changes playing a part in the increase in resistance We are unable to determine the presence, or assess the significance, of a persistent pulmonary vasoconstriction, but it is likely that, as in essential systemic hypertension, an increase in arteriolar tone precedes permanent structural changes

SUMMARY

In 22 patients with mitral stenosis the right ventricular and/or pulmonary artery pressures have been correlated with clinical, radiological, and electrocardiographic findings Pulmonary hypertension at rest was found in 17 patients In general, those with the most severe symptoms had the highest pressures, but the duration of symptoms was not related to the degree of pulmonary hypertension

Patients with severe pulmonary hypertension without peripheral venous congestion presented a recognisable syndrome characterised by predominant pulmonary symptoms and electrocardiographic evidence of right ventricular hypertrophy Patients with lesser degrees of pulmonary hypertension did not present characteristic features, but right ventricular enlargement on fluoroscopy was a constant finding The degree of pulmonary hypertension, however, can be determined only by direct measurement

Right ventricular enlargement was found in all patients with pulmonary hypertension There was no relation between the size of the left atrium and the degree of pulmonary hypertension

On exercise a striking rise in pulmonary-artery pressure occurred without a significant increase in cardiac output The pulmonary hypertension at rest and on exercise is due to stenosis of the mitral valve and to

(A) (B)

Fig 3—Patient no 22, with severe pulmonary hypertension (A) Small pulmonary artery showing fibrous intimal endarteritis the surrounding alveoli are filled with heart failure cells (× 205) (B) Pulmonary arteriole showing gross intimal fibroblastic hyperplasia the adjacent intra-alveolar capillaries are distended (× 580).

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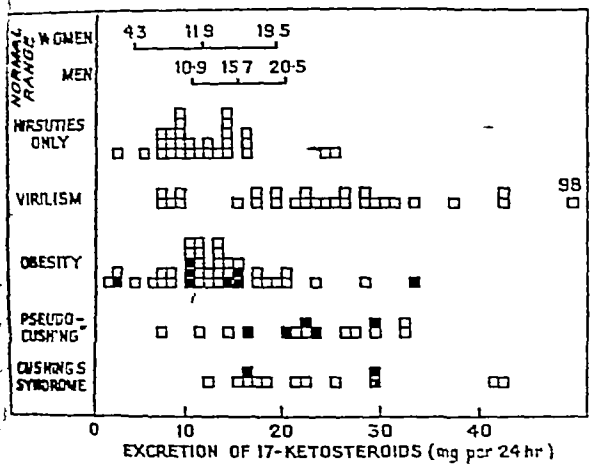

Fig. 1—17-K.S excretion in cases in which suprarenal overaction was suspected white squares female black squares male

and the 17 K S output Of the 13 cases of Cushing's syndrome 7 showed a moderately increased 17 K S excretion the maximum being 43 mg in twenty four hours in a woman with basophilism and virilism Normal 17 K.S excretion was found, however, in 2 fatal cases of florid basophilism Fig 1 shows that obese patients with the clinical features of Cushing s syndrome show a group tendency to increased 17-K.S output compared with patients with simple obesity, but the estimation has a very limited value in the individual case A more consistent difference is found between cases of virilism and simple hirsuties, but here again there are individual exceptions

In only 1 patient in the whole series was 17-K S excretion sufficiently high to support the diagnosis of secreting adrenal tumour The excretion value rose to 0·8 mg in twenty four hours On exploration adrenal hyperplasia alone was found The adrenals were examined at operation or at necropsy in 9 other cases without any tumours being found, but adrenal hyperplasia was reported in 3 cases In none of the remainder of the series did the subsequent clinical course provide any final proof of adrenal tumour

2. *Decrease in 17-K.S Excretion Expected* (fig 2)

Addison's Disease—In the 7 verified cases of Addison's disease there was a great decrease in 17 K.S excretion, which was usually less than 1 mg in twenty-four hours in women and less than 3 mg in twenty-four hours in men. The diagnosis of Addison's disease was not substantiated in 6 patients tested, and 4 of these had normal levels of 17 K.S excretion, the 2 others had severe chronic illness, and in both of them the 17 K S excretion was reduced to 2 mg in twenty-four hours In 1 case of Addison's disease determinations were made throughout pregnancy, the 17-K.S excretion gradually rose from nil before pregnancy to a maximum of 14 mg in twenty-four hours in the last month of pregnancy After labour 17-K.S excretion decreased rapidly in three days to nil.

Primary Pituitary Failure—In 9 cases of Simmonds's disease (males), the 17 K.S output was less than 2 5 mg in twenty-four hours In 20 cases where a diagnosis of pituitary failure was considered but finally excluded (including 8 cases of anorexia nervosa) only 1 had an output as low as this In many cases, however, especially in severe anorexia nervosa and myxœdema, subnormal levels were found. In mild anorexia nervosa 17 K S excretion was normal but decreased with protracted malnutrition Repeated estimations in 1 case complicated by pulmonary tuberculosis showed an eventual decrease to 1 2 mg in twenty four hours

Simmonds's disease developed in 3 patients after severe post partum hæmorrhage, in 1 case the 17-K S output was nil for the first four days of the puerperium and then increased gradually to 2 mg in twenty-four hours and remained at this level until the clinical signs of hypopituitarism became obvious In a small series of patients estimations performed in the immediate period after normal delivery showed a decrease in excretion compared with pre partum levels but remained within the normal range

Primary Testicular Failure—In 7 eunuchoidal men with testicular atrophy 17 K.S excretion was 5 5–11 mg in twenty four hours Estimations were also done in 14 young adults with poor development of secondary sex characters (8 had gynæcomastia) Presumably no interstitial cells had been destroyed, because sexual maturity was attained later In this group 17-K S output was 7–23 mg in twenty four hours The only inference to be drawn from this small series is that cases of testicular atrophy show a group tendency to a low normal 17 K S excretion which is absent in cases of delayed puberty In the individual case a low figure has no diagnostic value, but a high normal value (over 15 mg) may be taken to indicate undisturbed testicular function

3 *Miscellaneous Conditions*

Dwarfism—In 13 cases of varying types of dwarfism associated with sexual infantilism 17 K S excretion was 0–11 mg in twenty-four hours In 3 of these cases dwarfism was due to destruction of the pituitary gland by a craniopharyngioma, and the values were 0, 0 7 and 2 3 mg in twenty four hours In the 10 other patients the estimation was of no apparent diagnostic value

Pituitary Tumours—A normal result was obtained in 7 cases of *acromegaly* The test was therefore of no value in confirming the diagnosis or in assessing the activity of the disease In 7 cases of *chromophobe adenoma* of the pituitary gland the 17-K.S excretion was 7 0–27 3 mg in twenty-four hours, but these values could not be correlated with the clinical evidence of endocrine function, the highest value was found in a woman with no endocrine abnormalities In this group 3 women presented with *amenorrhœa* and *obesity*, and in them the 17-K.S excretion was 7 0–22 5 mg in twenty-four hours

Other Conditions—Estimations were made in 9 cases of menstrual disturbances, 2 cases of pregnancy, 3 cases of thyrotoxicosis 3 cases of aspermia or impotence, and

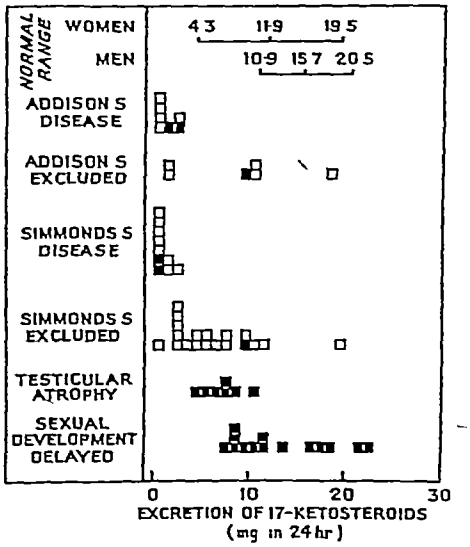

Fig 2—17-K.S. excretion in cases in which suprarenal underaction was suspected white squares female black squares male.

increased pulmonary arteriolar resistance The relative importance of these two factors is discussed

Our thanks are due to Dr C V Harrison and Dr I Doniach for help with the histological material, and to Miss M S McAdam, Miss Z Taylor, and Mr E E Barrett for technical assistance

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17-KETOSTEROID EXCRETION IN THE DIAGNOSIS OF ENDOCRINE DYSFUNCTION

W R BUTT
B Sc Lond, A R I C

A STUART MASON
M B Camb, M R C P

C J O R MORRIS
Ph D, M Sc, F R I C

From the Medical and Endocrine Units, London Hospital

TEN years have elapsed since Crooke and Callow (1939), finding that patients with secreting tumours of the adrenal cortex excreted large quantities of 17 ketosteroids (17 K S), suggested that estimation of these steroids might help in the diagnosis of such tumours Since that time the original method of estimation (Callow et al 1938) has been modified by various workers, and steroids have been estimated in many different clinical conditions

The precursors of these steroids are derived from the adrenals and testes, but their nature is unknown Variations in adrenal and testicular function are reflected by alterations in the excretion of 17 K S, and estimation of these in the urine has been used widely as a diagnostic aid We discuss here how far such estimations are useful in the diagnosis of endocrine dysfunction

METHOD AND CLINICAL MATERIAL

The neutral 17 K S values reported here were obtained by the polarographic method of Barnett et al (1946a) and Butt (1950) All the estimations were made on 24 hour specimens of urine as soon as possible after collection The accompanying table shows published normal figures, obtained by various methods, for males and females The advantages of the polarographic method over colorimetric methods have been fully discussed by Barnett et al (1946b)

Most of the patients were under the care of the medical staff of the London Hospital, but some estimations were performed on patients in other hospitals, for the latter the physicians in charge kindly supplied clinical details and other diagnostic findings In all the cases estimation was requested as an aid to the diagnosis of suspected endocrine dysfunction Patients under the age of 14 and cases without clinical details or a diagnosis have been excluded

RESULTS

The 235 cases that have been investigated are reviewed in three categories (1) those in which an increase in 17 K S excretion was expected from the provisional diagnosis, (2) those in which a decreased excretion was expected, and (3) a miscellaneous group

1 *Increase in 17 K S Excretion Expected*

The estimation was carried out in 127 cases as a test for adrenal cortical hyperfunction possibly due to a tumour The patients were divided into two groups: (*a*) cases of hirsutism in women, occurring either alone or as part of a virilising syndrome, and (*b*) cases of obesity with a definite or tentative diagnosis of Cushing's syndrome The results are shown in fig 1

In the group of hirsuté women there was a pronounced difference in 17 K S excretion between those with excessive body and facial hair as the only feature and those with a more complete picture of virilism Only 2 of the 30 women with hirsutism alone had an increased 17 K S excretion (25 and 26 mg in twenty four hours), whereas of the 28 patients with virilism 20 had an increased 17 K S excretion Usually the increase in 17 K S excretion corresponded to the degree of virilism, but in 1 patient with a normal 17 K S output virilism was severe and laparotomy three years previously had shown adrenal hyperplasia In 4 cases an ovarian disturbance was probably responsible for the virilism, since on exploration the adrenals were found to be normal and the ovaries diseased In 1 of these an ovarian tumour of obscure histology was present and 17-K S excretion was normal In the other 3 there was a high 17 K S excretion (20, 27, and 29 mg in twenty four hours), arrhenoblastoma of the ovary was found in 1 case, and sclerosis of the ovaries—syndrome of Stein and Leventhal (1935)—in the 2 others

The patients with obesity were classified in three clinical groups (*a*) simple obesity with or without minor endocrine stigmata (41 cases), (*b*) syndromes somewhat resembling Cushing's syndrome (15 cases), and (*c*) classical Cushing's syndrome (13 cases) In simple obesity 17 K S excretion was 1 5–34 0 mg in twenty four hours without apparent relation to any clinical signs of endocrine dysfunction Of the 15 patients with benign or chronic conditions resembling Cushing's syndrome 14 had an increased excretion (maximum 33 mg in twenty four hours), but again there was no correlation between the severity of the disturbance

COMPARISON OF "NORMAL RANGES" OF NEUTRAL 17 KETOSTEROID EXCRETION

Authors	No of cases	Sex	Range (mg /24 hr) (Mean ± 2 × S D)	Method
Baumann and Metzger (1940)	11	M	9 0–21 0	Zimmermann-Callow
Patterson et al (1942)	9	M	5 3–21 3	Zimmermann-Callow
Pincus and Hoagland (1943)	16	M	5 6–12 8	Zimmermann-Callow
Salter et al (1946)	14	M	6 2–22 2	Pincus (1943)
Salter et al (1946)	14	M	8 5–23 2	Modified Zimmermann
Barnett et al (1946a)	24	M	10 9–20 5	Polarographic
Barnett et al (1946b)	8	M	11 0–22 6	Polarographic
Drekter et al (1947)	35	M	10 0–28 9	Modified Zimmermann
Forbes et al (1947)	73	M	6 7–27 2	Fraser et al (1941)
Patterson et al (1942)	12	F	1 4–13 4	Zimmermann-Callow
Salter et al (1946)	14	F	2 1–13 7	Pincus (1943)
Salter et al (1946)	14	F	3 0–13 0	Modified Zimmermann
Barnett et al (1946a)	20	F	4 4–19 5	Polarographic
Barnett et al (1946b)	20	F	3 5–22 6	Zimmermann-Callow
Forbes et al (1947)	65	F	3 8–16 9	Fraser et al (1941)

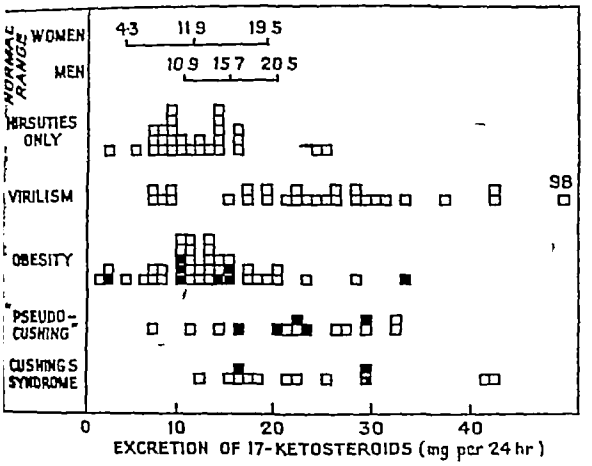

Fig. 1—17-K.S excretion in cases in which suprarenal overaction was suspected white squares, female black squares male

and the 17 K.S output Of the 13 cases of Cushing's syndrome 7 showed a moderately increased 17 K S excretion, the maximum being 43 mg in twenty four hours in a woman with basophilism and virilism Normal 17 K.S excretion was found, however, in 2 fatal cases of florid basophilism Fig 1 shows that obese patients with the clinical features of Cushing's syndrome show a group tendency to increased 17 K S output compared with patients with simple obesity, but the estimation has a very limited value in the individual case A more consistent difference is found between cases of virilism and simple hirsuties, but here again there are individual exceptions

In only 1 patient in the whole series was 17-K S excretion sufficiently high to support the diagnosis of secreting adrenal tumour The excretion value rose to 9·8 mg in twenty four hours On exploration adrenal hyperplasia alone was found The adrenals were examined at operation or at necropsy in 9 other cases without any tumours being found, but adrenal hyperplasia was reported in 3 cases In none of the remainder of the series did the subsequent clinical course provide any final proof of adrenal tumour

2. *Decrease in 17 K S Excretion Expected* (fig 2)

Addison's Disease—In the 7 verified cases of Addison's disease there was a great decrease in 17-K S excretion, which was usually less than 1 mg in twenty four hours in women and less than 3 mg in twenty four hours in men The diagnosis of Addison's disease was not substantiated in 6 patients tested, and 4 of these had normal levels of 17 K S excretion, the 2 others had severe chronic illness, and in both of them the 17-K S excretion was reduced to 2 mg in twenty-four hours In 1 case of Addison's disease determinations were made throughout pregnancy, the 17 K S excretion gradually rose from nil before pregnancy to a maximum of 14 mg in twenty four hours in the last month of pregnancy After labour 17 K.S excretion decreased rapidly in three days to nil.

Primary Pituitary Failure—In 9 cases of Simmonds's disease (males), the 17 K.S output was less than 2 5 mg in twenty-four hours In 20 cases where a diagnosis of pituitary failure was considered but finally excluded (including 8 cases of anorexia nervosa) only 1 had an output as low as this In many cases, however, especially in severe anorexia nervosa and myxœdema, subnormal levels were found. In mild anorexia nervosa 17 K S excretion was normal but decreased with protracted malnutrition Repeated estimations in 1 case complicated by pulmonary tuberculosis showed an eventual decrease to 1 2 mg in twenty four hours

Simmonds's disease developed in 3 patients after severe post partum hæmorrhage, in 1 case the 17 K S output was nil for the first four days of the puerperium and then increased gradually to 2 mg in twenty-four hours and remained at this level until the clinical signs of hypopituitarism became obvious In a small series of patients estimations performed in the immediate period after normal delivery showed a decrease in excretion compared with pre partum levels but remained within the normal range

Primary Testicular Failure—In 7 eunuchoidal men with testicular atrophy 17 K S excretion was 5 5–11 mg in twenty four hours Estimations were also done in 14 young adults with poor development of secondary sex characters (8 had gynæcomastia) Presumably no interstitial cells had been destroyed, because sexual maturity was attained later In this group 17 K S output was 7–23 mg in twenty four hours The only inference to be drawn from this small series is that cases of testicular atrophy show a group tendency to a low normal 17 K S excretion which is absent in cases of delayed puberty In the individual case a low figure has no diagnostic value, but a high normal value (over 15 mg) may be taken to indicate undisturbed testicular function

3 *Miscellaneous Conditions*

Dwarfism—In 13 cases of varying types of dwarfism associated with sexual infantilism 17 K S excretion was 0–11 mg in twenty-four hours In 3 of these cases dwarfism was due to destruction of the pituitary gland by a craniopharyngioma, and the values were 0, 0 7, and 2 3 mg in twenty-four hours In the 10 other patients the estimation was of no apparent diagnostic value

Pituitary Tumours—A normal result was obtained in 7 cases of *acromegaly* The test was therefore of no value in confirming the diagnosis or in assessing the activity of the disease In 7 cases of *chromophobe adenoma* of the pituitary gland the 17-K S excretion was 7 0–27 3 mg in twenty-four hours, but these values could not be correlated with the clinical evidence of endocrine function, the highest value was found in a woman with no endocrine abnormalities In this group 3 women presented with *amenorrhœa* and *obesity*, and in them the 17-K S excretion was 7 0–22 5 mg in twenty-four hours

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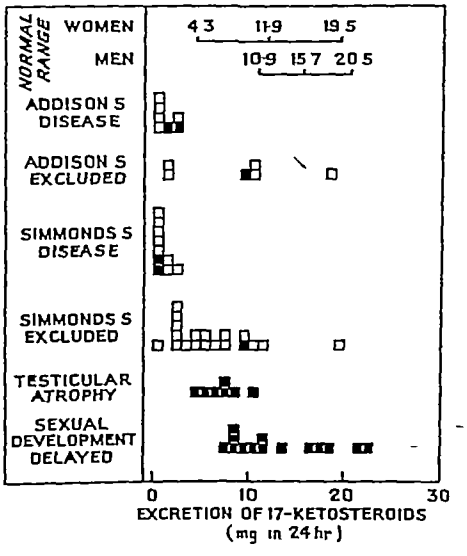

Fig 2—17 K.S excretion in cases in which suprarenal underaction was suspected: white squares female, black squares male

1 case each of acne, hydatidiform mole, cutaneous striæ, and gigantism A patient with severe pre eclamptic toxæmia of pregnancy excreted 2 6 mg of 17 K S in twenty four hours Excretion was normal in all the other cases, and in no instance did the estimation contribute to the diagnosis

DISCUSSION

Correct interpretation of urinary 17-K S estimations obviously depends on the reliability of the method In our experience the major cause of error has been inaccurate collection of urine samples Since the result is expressed as output in twenty four hours, a complete collection of urine over that period of time is essential Unfortunately the importance of this is not always realised by patients and nurses

Several factors other than endocrine disease may influence the 17-K S output Excretion varies considerably with age, rising steadily from early puberty to a peak at the age of 25 It then declines with increasing age, slowly in the male and more sharply in the female, to reach a constant level in the mid thirties, after which it decreases further in old age (Hamburger 1948) The output is diminished by about half in chronically ill, debilitated, or malnourished people (Forbes et al 1947) Impairment of liver function also leads to decreased excretion (Fraser et al 1941) Values above normal have been found on occasions in this laboratory in patients with simple obesity, carcinoma of the bronchus, and ankylosing spondylitis Similar findings have been reported by Warren (1945) and Davison et al (1947) Hormonal therapy may influence 17 K S excretion, testosterone causes a definite increase, but methyl testosterone produces no significant change (Frame et al 1944) Deoxycortone does not seem to influence 17-K S excretion (Cuyler et al 1942) Administration of œstrogens usually diminishes the high output in virilism

The most common use of 17-K.S estimation has been to test for increased cortical function in cases of suspected adrenal tumour The estimation is of no value in the diagnosis of a non secreting adrenal tumour unless both adrenal glands have been destroyed, causing Addison's disease Most of the secreting tumours of the adrenal cause a considerable increase in 17 K S output, but with some such tumours the 17 K S excretion has been reported to be normal As Kepler and Mason (1947) have shown, tumours producing true virilism are associated with a considerable increase in 17 K S excretion, but, if the tumour gives rise to Cushing's syndrome without virilism, a normal 17 K S excretion is not uncommon Thus a normal value for 17-K S output may be taken to exclude the presence of a secreting adrenal tumour if virilism is present

The range of 17-K S output with adrenal tumours with virilism is very wide, varying from 100 to 2000 mg in twenty four hours (Dorfman 1948) Amounts up to 100 mg in twenty four hours may be found in patients with virilism due to simple hyperplasia, as in 1 case in the present series In patients who excrete so much 17 K S differential estimation is of value, since the B fraction is relatively higher in the presence of a tumour than in simple hyperplasia

As the present series shows, the ætiology of virilism is both variable and obscure, and 17-K S estimation has only a restricted value in diagnosis Increased 17 K.S output may be found in patients with virilism due to ovarian disease—e g, arrhenoblastoma (Goldberg et al 1947)—where the adrenals appear normal Virilism with adrenal hyperplasia may very occasionally be associated with a normal 17 K.S output Several workers have reported normal or only slightly increased 17 K S excretion in cases of active Cushing's syndrome (Fraser et al 1941, Warren 1945, Escamilla 1949) From our own findings it is apparent that there is no relation between the degree of activity of Cushing's syndrome and the 17 K S output, and that determination of the 17 K.S. excretion is of no value in differentiating Cushing's syndrome from obesity due to other causes.

There is sometimes uncertainty in the interpretation of a very low 17 K S output determined by the colorimetric method The polarographic method is sufficiently specific to give nil readings on blank specimens without introducing correction factors, which makes the test more reliable in the diagnosis of adrenal insufficiency In males with Addison's disease the production of testicular steroids may confuse the interpretation, but in hypopituitarism the test is of equal value in both sexes. Confusion may also result from decreased 17-K.S. secretion in severe anorexia nervosa or in myxœdema, but in the present series 17-K S excretion was seldom as little as that found in true adrenal or pituitary failure. This confirms the work of Fraser et al (1941)

In several conditions the 17 K.S output proved of no diagnostic value These include dwarfism (apart from hypopituitarism), acromegaly, chromophobe adenoma of pituitary, menstrual disturbances, hydatidiform mole, and aspermia

The 17 K S excretion is an indirect measure of only one type of adrenal activity Its estimation has its use in the assessment of endocrine function, but as a diagnostic aid it is of value in only two types of endocrinopathy it is a reliable test for adrenal failure, either primary or due to pituitary failure, and it also provides confirmatory evidence of cortical overaction in patients with virilism whether due to tumour formation or to cortical hyperplasia

SUMMARY

The results of 17 K S estimations on 253 patients with suspected endocrine dysfunction are reviewed Variations in the 17 K S excretion due to factors other than endocrine disease are discussed

The estimation proved of great value in the diagnosis of Addison's disease and Simmonds's disease, and provided a reasonable guide to the presence of adrenal hyperfunction in cases of virilism It was of no value in the differential diagnosis of Cushing's syndrome from other causes of obesity

The test does not assist materially in the diagnosis of other endocrine diseases

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MILKMAN'S SYNDROME IN IDIOPATHIC STEATORRHŒA COMPLICATED BY REFRACTORY MACROCYTIC ANÆMIA

ALASTAIR ANDERSON
M.B Camb, M R C.P

CONSULTANT PHYSICIAN, ROYAL BERKSHIRE HOSPITAL, READING
LATELY RESIDENT ASSISTANT PHYSICIAN,
ST THOMAS'S HOSPITAL, LONDON

At times the bowel complaint is overlooked the wasting weakness paleness are what is noticed and are thought to be due to another than the true cause —Samuel Gee (1888) The Cœliac Affection

In 1888 Gee described the stools of the "cœliac affection" and recognised that diarrhœa was by no means a necessary accompaniment "it may be that the patient voids daily but one large loose whitish frothing stool." Nevertheless in practically every text book of medicine the student is invited to believe that increased frequency of defæcation, at least in the morning, inevitably accompanies those anomalies of fat absorption comprising the sprue syndrome and not uncommonly called the fatty diarrhœas The truth is that, when diarrhœa does accompany the other classical qualities of the stool in the sprue syndrome—bulkiness, paleness, frothiness, offensiveness—the recognition of sprue is practically unavoidable But it cannot be emphasised too strongly that the symptoms of the sprue syndrome may include nothing referable to the gastro intestinal tract, and that the stools may be normal in frequency and in macroscopic appearance In these circumstances quantitative analyses of fæcal fat, or preferably fat balance studies, will be the only method of establishing the diagnosis and of revealing the true cause of cases presenting with one or more of the complications of the primary disorder—disturbances of erythropoiesis and of calcium and phosphorus metabolism being the most important

The case reported here is notable for the minimal signs of primary intestinal disease and for the great severity of the secondary manifestations

CASE RECORD

A farm labourer's wife, aged 29, was admitted to St Thomas's Hospital on May 4, 1942, with twenty weeks history of unproductive cough and loss of voice, and twelve weeks history of dyspnœa on exertion. She thought she had lost weight in the previous few weeks There was no hæmoptysis or other overt blood loss, œdema of the ankles or palpitations Her periods were regular Her appetite was poor and her bowels were opened once daily, with stools of normal appearance A week before admission a chest radiogram had shown no evidence of any lung lesion Her sputum was free from tubercle bacilli Apart from mastoidectomy in 1938 and appendicectomy in 1940 her health had been good Her mother, father, and nine siblings were alive and well, but a brother, who had had epilepsy from early childhood, had died at the age of 34, the immediate cause of death being unknown.

On examination the patient was small and sallow looking and older than her stated age Her temperature was 98·6°F, pulse-rate 80, respirations 20 per minute Her mucosæ were pale and her tongue was clean, shiny and smooth. There was no cheilosis or dysphagia The nails were normal, and there were no abnormal lymph nodes The blood pressure was 105/65 There was no clinical enlargement of the heart A soft systolic murmur was heard which was maximal in the second left interspace at the sternal edge and transmitted to the apex There were no abnormal signs in the chest The spleen was easily palpable and firm It was doubtful if the liver was enlarged No masses were felt The ocular fundi and the central nervous system were normal Endoscopy of the nasopharynx showed evidence of a mild lymphoidal infection and chronic laryngitis

Investigations —A blood-count on May 5 1942 showed red cells 1 980 000 per c.mm Hb (Haldane) 40%, colour index 1 01 white cells 2380 per c.mm with a normal differential count and reticulocytes less than 0 1% A film of peripheral blood showed much anisocytosis and poikilocytosis, some polychromasia and two hæmoglobinised megaloblasts On May 7 the aspirated sternal marrow showed polymorphs 19 5%, lymphocytes 1 75%, monocytes 0 25%, eosinophils 1 75%, metamyelocytes 8 75%, neutrophil myelocytes 7 0%, eosinophil myelocytes 0 75% transitional myeloblasts 0 5%, myeloblasts 0 75%, normoblasts A 8 0%, normoblasts B 8 5% normoblasts C 8 25%, and megaloblasts 34 25% The pathologist's report commented on the high proportion of megaloblasts, of which a third were hæmoglobinised, and described the appearance as "typical of pernicious anæmia" On the same day occult blood was found in the fæces On May 8 a histamine test-meal was abandoned because the patient was uncoöperative On May 13 a blood-count showed red cells 1,590 000 per c mm, Hb 31% colour index 0 97, and icteric index 6 Occult blood was again found in the fæces

Treatment and Progress —Pernicious anæmia was diagnosed, and an initial intramuscular injection of 'Pernæmon Forte' 20 ml was given

May 18 1942 the patient was very pale and looked ill Hæmorrhages were seen round both optic discs A blood count showed red cells 1 460,000 per c.mm, Hb 30%, colour index 1 03 and reticulocytes 4 4%

May 19 a blood transfusion of 1 pint was given, and a course of injections of pernæmon forte 2 ml twice weekly instituted

Further blood counts on May 21 (red cells, 2 120,000 per c mm Hb 41% reticulocytes 5 2%), and on May 28 (red cells 1,860,000 per c.mm Hb 42% reticulocytes 5 3%) having shown that there was no satisfactory response to liver therapy, a further blood transfusion of one pint was given on May 30 Thereafter the position improved, and on June 11 the Hb had risen to 74%

June 13 the patient complained of epigastric pain after food and was tender below the right costal margin A barium meal, given on June 22, revealed an active prepyloric ulcer

June 25 a blood-count showed red cells 4 100 000 per c mm, Hb 84%, and colour index 1 01, and the patient felt very well At this stage, owing to war circumstances she was discharged on pernæmon forte 2 ml fortnightly mist ferri et ammon cit 1 oz t d.s, and Meulengracht's diet In view of the refractoriness of the anæmia, the persistence of a colour index greater than unity, and more significant, the coexistence of a radiologically demonstrated gastric ulcer, the previous diagnosis of pernicious anæmia was considered to be almost certainly incorrect, but unfortunately there was no opportunity to investigate the case further at that time

Follow up —During the first two years after her discharge the patient was seen at irregular intervals in the follow up clinic and her general condition remained fairly satisfactory Her Hb level was well maintained between 94% and 110% on pernæmon forte 2 ml fortnightly, which was reduced to 2 ml monthly after three months Her colour index however remained persistently greater than 1 On two separate occasions she complained of soreness of her tongue, and examination showed it to be red and fissured but this condition settled spontaneously On Sept 3, 1942 (two months after discharge) she had an attack of diarrhœa, with up to ten motions in 24 hours The stools were bulky and dark (she was still taking iron) This attack lasted three weeks and gradually subsided A year after discharge low backache developed, of which the significance was not appreciated at the time This persisted with intermissions and was from time to time accompanied by aching pains behind both knees Apart from some discomfort on percussion of the spines between T6 and T10 and pain in the same area on extremes of extension and flexion, no abnormal signs were elicited and the knee joints remained clinically normal Radiography of the spine at that time revealed no abnormality of either bones or joints On Aug 2 1944, after two years' surveillance in the follow up clinic, the patient was returned to the supervision of her own doctor, who continued her monthly liver injections. Iron was omitted and having had no recurrence of epigastric pain the patient had reverted to a normal diet On Aug 7 1946, a further two years later, she was again sent to the clinic being 4½ months pregnant, pale, and dyspnœic About three months previously her doctor had changed her liver prescription to 'Examen 1 ml fortnightly and a blood-count showed red cells 4,350,000

per c mm, Hb 62%, and colour index 0 7 It was recommended that this dose of examen be doubled, and iron ('Fersolate' tab 2 b d) given in addition

Readmission—The patient was readmitted thirty four weeks later, having had a stillbirth twelve weeks previously, at full term She was complaining that the intermittent pain in her back had become more persistent and severe over the past twenty eight weeks, and there was now a similar pain across her shoulders and "a sort of pain" behind her knees and in her calves Her legs felt weak and she could climb stairs only with difficulty She had fallen on numerous occasions Apart from these pains she felt very well There had been no recurrence of diarrhœa Her weight was steady

On examination her skin was pale, but there was no pallor of her mucosæ Her tongue was normal and there were no abnormal lymph nodes, and no abnormal signs in the chest The systolic murmur heard during her first admission was unaltered Her apex beat was in the fifth interspace 3½ in from the midline The blood pressure was 105/75 The spleen was palpable 1 in. below the costal margin The edge of the liver was not felt Rectal examination was normal The urine contained no abnormal constituents The patient had a waddling gait suggesting a myopathy There was a slight dorsal kyphosis with well marked lumbar lordosis There was tenderness on percussion over the whole dorsal spine, but movements were full Flexion of the lumbar spine was limited by pain Other joints were normal No abnormality was found in the central nervous system Spondylitis ankylopoietica was tentatively diagnosed

Investigations—On April 14, 1947, radiography of the pelvis and sacro iliac joints showed fractures of both pubic rami and general decalcification of the pelvis There was poor definition of the left sacro iliac joint, but no definite change was seen. Radiography of the rest of the skeleton between April 16 and 23 showed pseudo fractures of the upper third of the shaft of the left fibula and of the posterior aspect of the shaft of the right tibia, at the junction of the upper and middle thirds of the right and left ulnæ, of the axillary borders of both scapulæ, and of the middle third of the right femur No change was found in the lumbar or the dorsal spine The radiologist reported that the appearances were those of Milkman's syndrome On April 18 a blood count showed red cells 3,400,000 per c mm Hb 76%, colour index 1 1, white cells 5400 per c mm, normal differential count, slight anisocytosis, hæmatocrit 36, mean corpuscular volume 106 c μ, mean corpuscular Hb 31 μμg, and mean corpuscular Hb concentration 29% On April 24 a test-meal showed the presence of free hydrochloric acid On April 29 the serum calcium was 9 mg per 100 ml., inorganic phosphorus 2 8 mg per 100 ml, and alkaline phosphatase 67 Shinowara units per 100 ml (normal 2 2–8 6 units) On May 6 aspirated sternal marrow contained Ferrata cells 2 0%, megaloblasts 2 25%, normoblasts A 4 5%, normoblasts B 8 0% normoblasts C 12 75%, myeloblasts 0 75%, neutrophil myelocytes 16 25% eosinophil myelocytes 4 50%, basophil myelocytes 0 25%, metamyelocytes 11 25%, transitional cells 19 75%, polymorphs 11 75%, eosinophils 1 0%, lymphocytes 4 0%, plasma cells 0 5% and monocytes 0 5%

Treatment and Progress—On May 9 1947, a course of proteolysed liver (Hepamino ½ oz t d s) was started by mouth Between May 10 and 13 58% of the daily intake (50 g) of fat was absorbed On May 11 the prothrombin index was 101%, dried fæces contained 53 4% of fat of which 55% was split On May 27 a blood count showed red cells 4,560,000 per c mm, Hb 84% and colour index 0 92 Between June 10 and 13 41% of the daily intake of fat was absorbed. On June 12 the serum calcium level was 8 0 mg and inorganic phosphorus level 2 9 mg per 100 ml

Diagnosis—Osteomalacia with Looser zones (Milkman's syndrome), due to idiopathic steatorrhœa and precipitated by the recent pregnancy

Treatment was begun with high potency 'Ostelin' 50 000 units t d s, with calcium gluconate 2 teaspoonfuls daily

Progress—After two weeks intensive treatment there was an important subjective improvement the bone and joint pains disappeared, and the patient was comfortable in bed for the first time for nine months On July 10, 1947, after a month's treatment, there was early calcification at all the fracture and pseudo fracture sites, with a generalised increase in bone density On July 30, the serum-calcium was 9 0 mg and inorganic phosphorus 4 8 mg per 100 ml., and radiography showed excellent callus at all the fracture sites, with normal mineralisation elsewhere Meanwhile the anæmia had responded slowly to the oral liver, and by Aug 1 the Hb was 94% The patient was discharged home the next day During the whole of this second admission, and particularly after defective fat absorption had been found, the naked eye appearances of her stools were followed with interest and, although they were sometimes bulkier than normal and somewhat paler, they never, even distantly, approximated to the classical descriptions of the stools in sprue

Follow up—Although the patient had been taught birth control methods before her discharge, she became pregnant again sixteen weeks after returning home It was decided that this pregnancy should be allowed to continue without any alteration in her maintenance therapy, except that intramuscular injections of 'Hepostab Forte' 4 ml monthly were substituted for the hepamino, which had become nauseating and iron (fersolate 2 tablets t d s) was provided in addition During the whole of this pregnancy the patient felt extremely fit, and on repeated estimations her serum-calcium and serum inorganic phosphorus were within normal limits

She was admitted to the obstetric ward on Aug 17, 1948 owing to anxiety about a residual pelvic deformity, and there, on Sept 5 after medical induction, a child weighing 4½ lb was born by high forceps delivery The puerperium was uneventful, and mother and child returned home seventeen days later

DISCUSSION

In the light of subsequent events it is particularly unfortunate that this patient was not induced to swallow a Ryle's tube during her first admission A diagnosis of pernicious anæmia cannot be certain in the absence of histamine fast achlorhydria This patient, however, before her premature but unavoidable discharge, provided circumstantial evidence that free acid was present when she developed a radiologically demonstrable gastric ulcer

In pernicious anæmia the coexistence of a simple gastric ulcer is so rare as to cast the gravest doubt on one or other diagnosis In this case a malignant ulcer, although a well recognised complication, was ruled out by the patient's subsequent progress Free hydrochloric acid was demonstrated after a histamine test meal on her second admission, but by this time the underlying but unrecognised steatorrhœa had led to osteomalacia of the third degree and verging on the fourth (Albright et al 1946)

Cooke et al (1948), presenting the hæmatology of 45 cases of idiopathic steatorrhœa, showed two main groups on examination of the blood films The first and smaller group presented a macrocytic picture, with well stained erythrocytes, closely resembling that of pernicious anæmia—there was, however, less poikilocytosis, and substantial numbers of target cells ("Mexican hat" cells) were present In the second and larger group there was considerable variation in depth of staining and in cell size, the smaller cells tending to be hypochromic and the larger normochromic Poikilocytosis was moderate in this group, and target cells were seen in most cases Out of 21 cases at initial examination, the colour index was greater than unity in 13, and in 8 of the 17 of these in which determinations were made the mean cell volume was greater than 105 c μ. The sternal marrow was examined in 17 cases, and in 4 of these the marrow was hypercellular, megaloblastic, and indistinguishable from that seen in pernicious anæmia The peripheral blood in these cases was macrocytic and fell into the smaller peripheral blood picture group already described as closely resembling pernicious anæmia The second and commoner type of marrow showed erythroblastic hyperplasia with a mixture of deformed iron deficiency normoblasts and large atypical erythroblasts Attention has also been drawn to these large

-throblasts by Innes (1948) They are smaller than galoblasts but larger than typical normoblasts, the ount of nuclear condensation is not so great as in a rmoblast with comparable hæmoglobinisation, and y have been described as "intermediate erythro sts" This review of recent studies of the bone rrow and peripheral blood in idiopathic steatorrhœa phasises the difficulty for the pathologist in differenti ng that condition from pernicious anæmia by hæmato ical examination alone In the first place a minority cases will be virtually indistinguishable, having a galoblastic marrow and macrocytic peripheral blood ture. It is true that there may be less poikilocytosis an is normally seen in pernicious anæmia, and a variable mber of target cells may be present, but neither of se can be regarded as reassuring criteria for the thologist In the other and larger group, although e marrow is erythroblastic, very many cells are of the ypical intermediate type and may be mistaken for galoblasts, leading to a diagnosis of pernicious anæmia, rticularly if the colour index is greater than 1 and e mean cell volume is increased Confusion becomes ater if the patient has been treated with liver, because e bone marrow of pernicious anæmia treated with madequate dosage of liver is commonly of the ermediate type

The response to therapy is likely to raise suspicion the correctness of a diagnosis of pernicious anæmia e anæmia of idiopathic steatorrhœa is refractory to er, and it is unusual to obtain normal maturation in ose cases presenting with the intermediate erythro astic type of bone marrow, although cases with a egaloblastic marrow may develop into the intermediate pe after liver therapy In all cases there is usually a ow increase in the amount of hæmoglobin and red lls in the peripheral blood—although seldom up to ormal levels Even after protracted and massive dministration of liver the marrow contains large numbers intermediate erythroblasts, and this defective matura on is reflected in the peripheral blood, where persistent normalities of the erythron lead to a high colour dex (often greater than unity) and an increased mean rpuscular volume, even when, as in the present case, e hæmoglobin has been raised to over 90% In this se it will have been noted that the bone marrow was egaloblastic on the patient's first admission, but e years later, after liver therapy throughout that iod, it had become "normoblastic" Since the mean puscular volume was still 106 c μ, probably at least ne of the "normoblasts" were in fact cells of the ermediate erythroblast type Further evidence of thron abnormality, even after treatment, is provided increased erythrocyte resistance to hypotonic saline ke et al. (1948) made fragility tests on 18 cases of pathic steatorrhœa and found that, with one excep n, their resistance was increased, and this increase s independent of the degree of anæmia In 5 out of ases, in which their treatment restored the number red cells and Hb to normal, the resistance of the red s was persistently increased Since this finding ably differs from that in pernicious anæmia, treated untreated, in which there is normal resistance, it may e as a method of distinction, and should be used enever there is doubt The same may be said for serum bilirubin level, classically raised in pernicious emia but normal or insignificantly raised in the emia of idiopathic steatorrhœa But these points only be subordinate, because, whenever there is doubt, investigations must be directed to the bowel ction, even when, as in the present case, there is overt evidence of any anomaly in absorption of

lthough most cases of idiopathic steatorrhœa present h obvious evidence of intestinal dysfunction—increased frequency of passage of bulky pale frothy offensive stools—a considerable number have only occasional episodes of diarrhœa, between which they may have a normal bowel habit or even constipation, and a still smaller number may for years betray their underlying disorder by nothing more dramatic than isolated and infrequent attacks of diarrhœa mistakenly regarded as simple gastro enteritis Such was the state of affairs in the present case This is not surprising, for there is little evidence that steatorrhœa as such causes diarrhœa Patients with idiopathic steatorrhœa and fluctuating periods of diarrhœa and constipation show no corresponding fluctuation in the amount of fæcal fat Further, it is usually possible with folic acid to produce a reversion to normal bowel frequency in patients with idiopathic steatorrhœa accompanied by diarrhœa, and fat balance studies before and after treatment commonly show no improvement whatever in fat absorption (Davidson et al 1947)

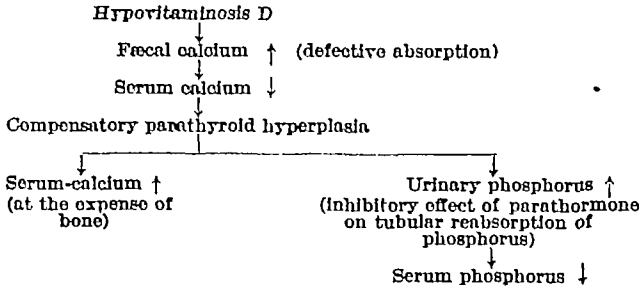
It is not unreasonable to suppose that, when diarrhœa develops in idiopathic steatorrhœa, it is symptomatic of some as yet unidentified part of the general deficiency pattern of this disease and is only coincidentally associated with an increased amount of fæcal fat, both being but symptoms of the underlying defect in bowel absorption The fact that folic acid may control diarrhœa in certain cases of idiopathic steatorrhœa with anæmia without producing a hæmopoietic response suggests that it has at least two separate actions, the one concerned with bowel function, and the other with hæmopoiesis (Davidson and Girdwood 1947)

In most institutions the investigation of suspected steatorrhœa must at present depend on quantitative analyses of fæcal fat, but, since the amount of fæcal fat fluctuates greatly—depending, among other things, on the daily intake of fat—and, when expressed in percentages, varies inversely with the amount of unabsorbed non fatty residue, many estimations must be made, with the patient on as standardised a diet as possible, before the results can be assessed A far better method, where practicable, is that of fat balance estimation (Cooke et al 1946) In this test a percentage of absorption of less than 90% is abnormal In the present case the percentage absorption was 58% on one occasion and 41% on the next The ætiology of this patient's steatorrhœa has not been established The only certain method of distinguishing between idiopathic steatorrhœa and fibrous pancreatitis is by duodenal intubation and estimation of the enzymal activity of the aspirated contents, and this has not been done Second ary and less reliable assistance may be obtained from the glucose tolerance curve, which tends to be flat in idiopathic steatorrhœa in contradistinction to that obtained in fibrous pancreatitis The curve was flat in the present case

Although steatorrhœa probably does not of itself produce diarrhœa, it is responsible for deficiencies of all the fat soluble vitamins—A, D, E, and K (Albright and Stewart 1940) On her second admission there was no evidence of deficiency of vitamin K in our patient (prothrombin index 101%), but there were ample signs of hypovitaminosis D, for she had osteomalacia, aggravated by the calcium drain of her recent pregnancy but directly due to her steatorrhœa

The usual variety of juvenile rickets is due to uncomplicated insufficiency of vitamin D, and this is also true of that form of adult rickets (osteomalacia) prevalent in China Consequently these conditions respond to small doses of vitamin D The same cannot be said for osteomalacia in the United States (Albright et al 1946) or in the United Kingdom Here again hypovitaminosis D is the commonest cause, but defective absorption is responsible and steatorrhœa the reason, if rare cases of raised resistance to vitamin D (McCance

1947) are excluded, and far larger doses of vitamin D are needed to produce a therapeutic response Albright et al (1946) have discussed the effects of hypovitaminosis D and the following summary analyses the features relevant to the present case



It will be noted that the result is a normal serum calcium level with a diminished serum phosphorus level The body-fluids contain too little inorganic phosphorus for the level of calcium, and normal calcification is impossible Osteomalacia results and, with it, increased osteoblastic activity leading to increased serum alkaline phosphatase The findings in the present case at the second admission illustrate this type of osteomalacia serum calcium 9 0 mg per 100 ml, serum inorganic phosphorus 2 8 mg per 100 ml, and serum alkaline phosphatase 67 Shinowara units (normal 2 2–8 6 units) per 100 ml

Although hypophosphatæmic osteomalacia is the commonest form, the relative values of serum calcium and serum phosphorus depend on the parathyroid response to a lowered serum calcium level, which itself is due to defective absorption If hyperplasia is lacking, a normal serum phosphorus level and a low serum calcium level—not infrequently down to tetanic levels—results If the response is partial, both serum phosphorus and serum calcium levels will be reduced In all cases the serum calcium and serum phosphorus levels will be below normal, and osteomalacia will result Attention must be drawn here to the futility of estimating the serum calcium level alone when attempting to decide whether osteomalacia is present Administration of vitamin D in sufficient dosage, provided the calcium intake is adequate, will restore calcium phosphorus metabolism to normal and cure the osteomalacia This result was rapidly attained in the present case with high potency ostelin 50,000 units t d s and calcium gluconate 2 teaspoonfuls daily

Finally, radiography in the present case revealed appearances variously described as Milkman's syndrome or multiple spontaneous idiopathic symmetrical pseudo fractures In this condition the radiograms show ribbon like bands of translucency in otherwise normal bone, often symmetrical and chronic, unless treated appropriately Attention was first drawn to them by Looser (1920) as occurring in osteomalacic states, and they are often referred to as Looser zones He considered them to consist of areas of uncalcified callus within the bone brought about by a "mechanical irritation due to strain" and by "small local infractions" (Looser 1940) Milkman (1934) described a case in which the bone lesions were unresponsive to therapy, thus differing from the German cases and constituting a new disease. McCullough (1940), on the other hand, thinks that they occur in many unrelated bone diseases and merely indicate weakening or overloading

Albright et al (1946) think that, though superficially similar lesions may appear in other bone conditions, Milkman's syndrome only occurs in osteomalacia They base this conclusion on four considerations (1) "the symmetrical ribbon like zones of decalcification seen by X ray, and often occurring in otherwise normal appearing bone, are characteristic of that disease and that alone", (2) "the serum calcium, phosphorus, phosphatase findings in most of the undoubted are those of osteomalacia", (3) "such patients respo to therapy based on the assumption that they ha osteomalacia", and (4) "the histopathology is that osteomalacia" They separate osteomalacia into fo degrees (1) "chemical osteomalacia with norm phosphatase", (2) "chemical osteomalacia with rais phosphatase", (3) "Milkman's syndrome", an (4) "advanced osteomalacia"—i e., general skelet demineralisation They believe it justifiable to rest the radiological diagnosis of Milkman's syndrome to ca attention to the fact that one can have underlying osto malacia when the only X ray evidence is the ribbon-li zones of decalcification

The tendency for the pseudo fractures of Milkm syndrome to develop symmetrically and in particu positions—the femoral necks the pubic and ischial ra the upper third of the ulnæ, the ribs, &c, and comme the axillary borders of the scapulæ—has aroused curi Looser believed that they occurred at points of li stress or tension, and pointed out that such stresses a liable to be symmetrical Le May and Blunt (194 having analysed the sites of election of these pseud fractures, find that there is a close correspondenc between them and the anatomical position of arteri passing adjacent to the bone—e g, the commonest sit of all is the axillary border of the scapula, where th circumflex scapular artery winds round in close appositio to the bone They believe that, if pressure of arteri in certain circumstances can groove normal bone, it not remarkable that osteomalacic bone would be affecte and that the "infractions" of Looser may be brough about in this way This matter remains debatable

SUMMARY

A case of occult steatorrhœa accompanied by grav disturbances of erythropoiesis and calcium phosphoru metabolism is described

The difficulties of differential diagnosis betwee pernicious anæmia and macrocytic anæmia due t idiopathic steatorrhœa are discussed

The mechanism of production of osteomalacia resultin from hypovitaminosis D, with special reference to th type known as Milkman's syndrome, is outlined

The importance of fat balance estimations is emphasised

The radiological appearance of Milkman's syndrom is described, together with a short review of the hypothes relating to the sites of the pseudo fractures (Looser zone characteristic of the syndrome

Owing to war time dislocations this patient came und the care of several members of the staff of St Thomas s, ar my grateful thanks are due to them for permission to publi this case and for many helpful suggestions and criticisms.

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RIMARY STREPTOMYCIN-RESISTANT BERCULOSIS IN A NEWBORN CHILD

MPLE METHOD OF ASSESSING STREPTOMYCIN RESISTANCE

J E TINNE
M.B, B Sc Edin, D P H
LECTURER DEPARTMENT OF BACTERIOLOGY

J L HENDERSON
M.D Edin., F R C P E
SENIOR LECTURER, DEPARTMENT OF CHILD LIFE AND HEALTH
UNIVERSITY OF EDINBURGH

HE readiness with which some strains of *Myco* ...*tuberculosis* develop resistance to streptomycin ...ng a protracted course of treatment is now well ...gnised, but it is only beginning to be realised that ...ptomycin resistant strains may, on rare occasions, be ...ted from patients before they have received any ...ptomycin (Cruickshank 1950) This possibility empha... the necessity for routine testing of the strepto...in sensitivity of strains isolated before the inception ...treptomycin therapy as well as during the course of ...tment The prognostic importance of this procedure ...trated in the following case of miliary tuberculosis ... young infant, from whom tubercle bacilli highly ...stant to streptomycin were isolated before the ...t of streptomycin therapy We are also describing ...ey and simple method of determining the degree of resistance in such cases

CASE RECORD

A female infant aged 11 weeks when admitted to the Royal Edinburgh Hospital for Sick Children on Aug 4, 1948, was born at the Eastern General Hospital Edinburgh on May 20 five weeks premature the second of binovular twins and weighed 4 lb 3 oz at birth She was breast-fed until the eighteenth day, when her mother, who had been running a remittent temperature since the eleventh day post partum, was suspected of having active tuberculosis At that time the infant was thriving and weighed 4 lb 13 oz She continued to thrive on a fresh cow s milk mixture and weighed 6 lb 1 oz. at 7 weeks At 9 weeks she ceased to gain weight, though she still fed well and looked healthy for the next week. Her abdomen then became distended and examination revealed a greatly enlarged spleen and a moderately enlarged liver In the last few days before her admission to the children s hospital she was feverish and taking her feeds badly

Family History—The child s parents were Irish A miniature radiogram of the mother s chest taken during pregnancy was negative She developed severe pre eclamptic toxemia in the thirty first week of pregnancy and was admitted to the maternity unit of the Eastern General Hospital On the tenth day of the puerperium she developed a remittent temperature and tachycardia she had had a slight cough for several months and night sweating since the delivery of the twins but no physical signs of disease were found in the chest The pyrexia increased and on the eighteenth day she complained of a pleuritic pain in the left chest Clinical and radiological examination then showed tuberculous infiltration at the left apex and an effusion at the left base The baby was thereafter kept apart from the mother who was transferred to a medical ward a week later Repeated examinations of the mother s sparse sputum, including routine culture and one guineapig inoculation, were negative as were examinations of gastric washings stools, urine and aspirated pleural fluid Her general condition improved, but after five months in the medical ward tomograms still showed tuberculousin filtration of the left upper lobe and a small peripheral cavity She refused artificial pneumothorax, and 46 weeks after the birth of her twins she returned to her parents' home in Eire Streptomycin was not given at any time during her hospital treatment. She had since returned to her own home in Edinburgh, but has consistently refused to attend a tuberculosis dispensary for examination The father, however had attended twice, and showed no evidence of tuberculosis

The other twin, a boy developed a volvulus of the small intestine and died after an operation when 5 days old

Condition on Admission—Small thin baby weighing 6 lb 14 oz with poor muscle tone, and several pustules on the scalp and trunk No cyanosis or dyspnœa Radiography showed miliary tuberculosis of the lungs (fig 1) The abdomen was greatly distended with slightly dilated superficial veins over the upper part The spleen and liver were greatly enlarged, both extended to 3 finger breadths below the costal margin and both were firm with a smooth surface No tubercles were ever seen in the optic fundi Red-cell count 3,200 000 per c.mm Hb 72% white cells 16 600 per c mm A Mantoux test with O T 1 in 1000 was negative Gastric washings did not show any tubercle bacilli on direct examination of concentrate smears but human type tubercle bacilli which proved to be highly resistant to streptomycin were grown on culture Cerebrospinal fluid (C S F) normal

Treatment and Progress—Streptomycin, 20 mg per lb body weight per day was begun three days after admission Four hourly injections of 25 mg were given intramuscularly The child fed well for her first six days in hospital and gained ½ lb In the next few days her weight fell rapidly though she still fed well Her weight fell 1½ lb to 5 lb 14 oz in the second and third weeks in hospital and it then remained at about 6 lb for many weeks until a few days before her death. The Mantoux test with O T 1 in 1000, when repeated eleven days after her admission had become positive She was apyrexial for her first five weeks in hospital but later her temperature occasionally rose to 100°F The C S F was examined weekly and was always normal Radiography of the chest a month after her admission showed diminution of the miliary mottling and some consolidation in the right upper lobe and eight weeks after admission the liver and spleen had become much smaller and radiography showed less pronounced mottling in the lungs but increased consolidation in the right upper lobe (fig 2) Ten and a half weeks after the start of streptomycin therapy the dosage was changed to 50 mg eight-hourly until the course was stopped two weeks later after twelve and a half weeks treatment During this last fortnight of therapy the streptomycin titre in the blood was estimated on several occasions half an hour after injection blood streptomycin level was 16 µg per ml on two occasions and 32 µg per ml on one occasion four hours after injection it was 16 µg per ml on one occasion, and eight hours after injection it was 8 µg per ml on one occasion and less than 2 µg per ml on another The erythrocyte-sedimentation rate remained raised throughout the illness varying between 32 and 43 mm per hour A week after the end of streptomycin therapy gastric washings were collected on several occasions for examination for tubercle bacilli the result was the same as that before the start of treatment, no tubercle bacilli being found on direct films, but tubercle bacilli of human type, highly resistant to streptomycin being isolated on culture The child s condition deteriorated and she died eleven days after the end of the streptomycin therapy at the age of 25 weeks her weight was only 5 lb 3 oz. No further radiological changes had taken place in the chest. Permission for a necropsy was not given

BACTERIOLOGY

A culture of tubercle bacilli isolated from gastric washings only a few days before death was available

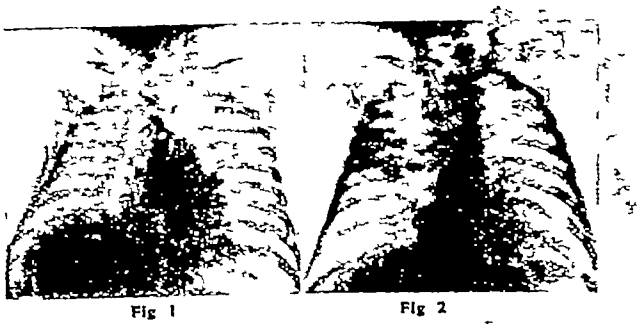


Fig 1 Fig 2

Fig 1—Radiogram of chest before start of streptomycin therapy showing diffuse mottling of miliary tuberculosis and some medial collapse of right upper lobe

Fig 2—Radiogram of chest eight weeks after start of streptomycin therapy showing diminished mottling in lung fields and massive consolidation of right upper lobe.

for comparison of streptomycin sensitivity with the original culture similarly obtained at the time of admission to hospital During the twelve and a half weeks between the isolation of these two cultures the patient had received about 11 6 g of streptomycin, and it was hoped that a study of the organism might throw some light on the failure of the antibiotic to check the tuberculosis

In the first instance both cultures were tested for streptomycin sensitivity by the Dubos method, which is routinely used in Medical Research Council trials This method, which is widely applied, uses the detergent-containing medium of Dubos, in which, after one or more subcultures, the tubercle bacilli grow as a visible turbidity A series of doubling dilutions of streptomycin is then added to bottles of the same medium, and, by a further subculture, the minimal dose required to inhibit growth is determined The details of the test are given elsewhere (Medical Research Council 1948) Although the degree of streptomycin resistance of the great majority of strains of *Myco tuberculosis* can be demonstrated by the Dubos method, the test is of limited value, since the range of concentration of streptomycin, which usually varies from 0 03 to 6 μg per ml, may prove too narrow and the maximal concentration may not completely inhibit highly resistant strains In the present case three separate tests on each specimen showed that there was no apparent inhibition of either of the patient's cultures, even by the highest concentration of 6 μg per ml of streptomycin Since the control H37RV was uniformly sensitive to 0 5 μg per ml, the relative degree of resistance in both cases was not less than twelve times that of the control A sensitivity test with a wider range than that provided by the standard Dubos method for the estimation of high degrees of streptomycin resistance is therefore necessary in such circumstances

Fig 3—Vertical diffusion method of estimating streptomycin resistance A single large resistant colony of the strain H37RV is growing on a Löwenstein-Jensen slope at the base of which is a solution containing 100 μg of streptomycin per ml

Crofton and Mitchison (1948), by testing different colonies from the same culture from a case under treatment, have shown that there may be different degrees of resistance present It is therefore essential to make the inoculum for any test truly representative by drawing the loop over a wide area of the primary culture, and we have adopted the precaution of emulsifying the specimen so obtained very thoroughly by an hour's slow mechanical shaking in a bottle with glass beads But, even if the sampling is satisfactory, the method only gives an over all picture of the sensitiveness or resistance of the patient's strain at the time of the test and no indication of its future state It could not, for instance, discriminate between a large number of moderately resistant bacilli partially inhibited and multiplying slowly and a few highly resistant bacilli totally uninhibited and multiplying rapidly

Holt and Cruickshank (1949) described a simpler and quicker sensitivity test for routine use in which cultures on slopes of Löwenstein Jensen medium are compared with parallel cultures on the same medium in which 2–5 μg per ml of streptomycin has been inco The streptomycin can be added either by mixing the medium before its solidification, with allo loss of potency on heating, or by allowing the slope to absorb streptomycin solution uniformly surface while lying horizontally Any culture grows on plain medium but not on the strep containing medium is regarded as sensitive a few late colonies may appear on the treated these can be disregarded A method using slo as this one, reduces the risk, inseparable from of liquid media, that resistant bacilli which m been comparatively scanty in the inoculum will to dominate the final result

"VERTICAL DIFFUSION" STREPTOMYCIN SENSITIVITY TEST

One of us (J E T) also had experimented cultures on solid medium, using a method in diffusion of streptomycin from the base of a Löwe Jensen slope This "vertical diffusion metho simple to use and gives not only a broad indica sensitivity but also an indication of the num resistant variants, which may have a consi bearing on the degree of present and future res to streptomycin Since it seems particularly app to the type of case recorded in this paper the method i described in detail

ESTIMATION OF STREPTOMYCIN SENSITIVITY OF VARIOUS STRAINS OF *Myco tuberculosis* BY VERTICAL DIFFUSION METHOD

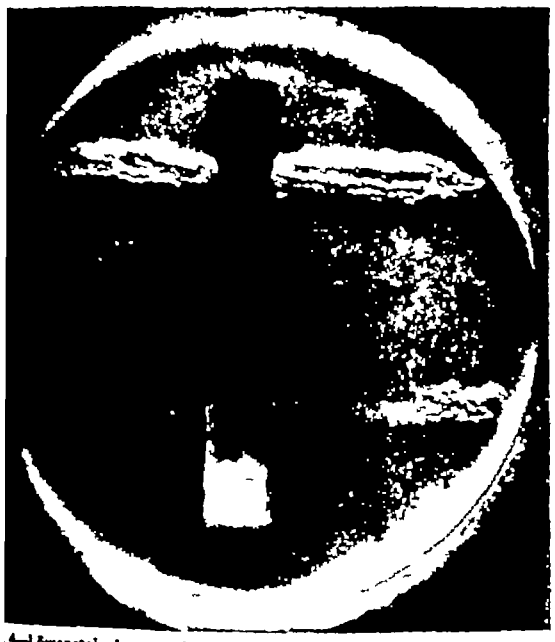
Strain	Dubos method (μg per ml.)	Vertical diffusion method: Zones of inhibition with streptomycin in cm at 4 weeks to nearest 1/4 cm (averages)			No of colonies in zones of inhibition at 6 weeks	
		1 μg per ml	10 μg per ml.	100 μg per ml.	10 μg per ml.	100 μg per ml.
No 1	1/8	1 75	3 25	Complete inhibition	0 & 1	0 & 0
No 2	1/4	1 5	3	"	0 & 1	0 & 1
No 3	1/4	1 5	2 75	"	1 & 1	0 & 0
No 4	1/8	1	2 5	"	1 & 2	0 & 1
H37 RV	1/8	1 25	2 75	"	0 & 3	0 & 1
No 5	2	0 5	2 25	"	6 & 9	1 & 3
No 6	>6	Nil	1 5	"	Uncountable	55
No 7	>6	Nil	Nil	Nil	"	Uncountable

The tests were performed in duplicate on all strains except 6 and 7 which were from the present case and thus two readings were obtained of the number of resistant colonies

Method—6 ml amounts of Löwenstein Jensen medium are poured into 1 oz screw capped vials and solidified as slopes in the usual manner Any condensation water is decanted and 1 ml of streptomycin solution is then added to the bottle at the base of the slope in three strengths—1, 10, and 100 μg per ml Such concentrations cover the range attainable by clinical dosage The vials are then labelled and kept refrigerated until required

For each test the specimen is concentrated—e g., by Petroff's alkali or Jungmann's acid iron peroxide method—and loaded standard loopfuls are inoculated by stroking the entire slope of plain Löwenstein-Jensen medium and the streptomycin containing media, the "1" and "10" strength being essential in all cases, and the "100" concentration repaying inclusion, especially in cases of increasing resistance in the course of treatment. Similar cultures of the strain H37RV are also made as controls The bottles are incubated in the upright position

After three or four weeks' incubation at 37°C confluent growths are seen on the control slopes, whereas the bottles containing streptomycin show zones of complete inhibition extending from the foot of the bottle and varying in extent with the dose of streptomycin and the sensitivity of the organism Thus in an average case of sensitivity 1 μg per ml may cause inhibition on about a third of the slope, 10 μg per ml on about two thirds, and 100 μg per ml on the whole



4—Löwenstein Jensen plate with gutter containing 100 μg per ml
lution of streptomycin This shows the high degree of streptomycin
sistance of strain 7 of *Myco tuberculosis* from the case described
compared with that of a sensitive control (H37RV) Growth of
ontrol culture (above) is restricted to one edge of plate whereas
sistant strain (below) is growing uninhibited up to margins of gutter

it From the fourth week onwards, however, a very few
mute isolated colonies begin to appear in the zone of inhibi
n, irregular in distribution but most numerous at the upper
argin. The number of such colonies of streptomycin
sistant variants tends to be small and fairly constant (see
ble) Fig 3 shows a bottle containing a single large colony
the strain H37RV resistant to 100 μg per ml of strepto
ycin. That they were truly resistant and not due to the
reptomycin s losing its potency was proved by testing the
ndual solution in the bottle for activity

Streptomycin-antagonist Medium—Where the patient has
ready been on streptomycin therapy, culture of the infecting
ganism is often unsuccessful unless a streptomycin antagon
is added to the medium We use Löwenstein-Jensen slopes
which 2 mg of cysteine hydrochloride per ml of the medium
added before pouring During subsequent heating the
werful reducing action of the cysteine may bleach the
lachite green with which the medium is coloured, but,
en the bottles are stood with their caps screwed down, the
becomes deeper in colour When growth has been
ieved on the cysteine medium the organisms are inoculated
the streptomycin-containing bottles for subsequent sensi
ty tests By this method one specimen from a patient who
received streptomycin therapy for nine months was
cessfully grown after five negative results on the ordinary
imm.

Results—The accompanying table gives the results of the
in several representative strains showing initial sensitivity
streptomycin, and in the strain from our patient which
wed initial resistance to streptomycin

The extraordinarily high degree of resistance of the
anisms isolated from our patient both before and
r streptomycin therapy contrasts sharply with the
ree of resistance shown by all the other strains
ed Strain 6, obtained before the start of strepto
cin therapy, was totally uninhibited by 1 μg but
sitive to 10 μg of streptomycin after incubation for
month, but with longer incubation resistant colonies
ame uncountable with 10 μg, and 55 such colonies
e present even with 100 μg In strain 7, obtained
r the completion of 3 months' streptomycin therapy
resistant organisms had multipled to such an extent
t confluent growths were obtained at both 10 and
μg as well as at 1 μg after incubation for a month
is noteworthy that although the initial streptomycin
istance was so high it was considerably enhanced by
ee months' streptomycin therapy just as in the vast
majority of cases with little or no initial streptomycin resistance The intense resistance developed is well shown in the Löwenstein-Jensen plate (fig 4) Strain 7 and the control strain (H37RV) were stroked on the medium at right angles to a gutter containing a solution of streptomycin in a concentration of 100 μg per ml The plate was then sealed and incubated at 37°C for two months The growth of the control culture was restricted to one edge of the plate, while the resistant specimen grew uninhibited up to the margin of the gutter on both sides

DISCUSSION

It is unfortunate that most streptomycin sensitive organisms tend to become increasingly resistant to streptomycin when exposed to it, some strains show this tendency to a much greater degree than others During the long course of treatment of tuberculous patients streptomycin resistance develops slowly and can seldom be demonstrated in the first month There after widely differing rates of development have been reported, but all are agreed that there is a rapid increase in resistance in the second month of streptomycin therapy Several workers have shown that streptomycin resistance is very uncommon before the start of streptomycin therapy Blattberg and Ehrhorn (1949) tested the streptomycin resistance of tubercle bacilli obtained from 39 patients before, during and after treatment with streptomycin 1 g daily for 90–180 days Before the start of treatment none of the 32 strains tested was resistant to 2 5 μg of streptomycin per ml After 30 days' treatment no resistant strains were found After 60 days 13% had resistant bacilli, after 90 days 29%, and after 100–120 days 45% The proportion of resistant bacilli increased after cessation of treatment in 4 cases Nevertheless, Pyle (1947) and others have shown that tubercle bacilli isolated from patients before the institution of streptomycin therapy do not have a uniform susceptibility to the bacteriostatic action of streptomycin Youmans and Williston (1948) found that streptomycin resistant variants were obtained from 43½% of 57 strains of tubercle bacilli isolated before the inception of streptomycin therapy, and they believe that the isolation of streptomycin resistant variants before the beginning of, or early in the course of, therapy indicates the probability of development of resistant strains, and thus the prognosis

The development of streptomycin resistant strains in the community which has recently been observed is probably caused, in the vast majority of cases, by infection from patients who have received streptomycin therapy and in whom the surviving tubercle bacilli have developed streptomycin resistance Thus, the proportion of streptomycin resistant tubercle bacilli in the community will be likely to increase in proportion to the greater use of streptomycin This accommodation of susceptible organisms to antibiotics by the development of resistant strains is a feature of antibiotic therapy in general, the increasing prevalence of penicillin resistant *Staph aureus* being a notable example

The likelihood that cases of tuberculosis which show initial resistance to streptomycin will become increasingly prevalent emphasises the need for routine sensitivity tests To be of value the results of any sensitivity test should be available before, or at least at an early stage in, streptomycin treatment, and the ideal plan would be to test the diagnostic cultures of cases on entry to hospitals or sanatoria and to record the findings for reference The vertical diffusion method described here offers a simple and rapid test suitable for routine use in small laboratories, and by indicating resistant variants as well as the general level of sensitivity it may suggest the probable response to streptomycin It is particularly suitable for the type of case which we have described because it reveals the full extent of the initial resistance

and the hopelessness of even massive therapy which might succeed in a border line case

We believe the case recorded here is of particular interest and rarity, because the streptomycin resistance observed before the start of streptomycin therapy must almost certainly have been a primary resistance and not the more common acquired resistance produced in the infecting strain by streptomycin therapy In May, 1948, when this infant was infected, streptomycin had not become available for general hospital use in Scotland, the meagre supply being still allotted to research units It therefore seems extremely unlikely that infection could have been contracted from anyone harbouring tubercle bacilli rendered streptomycin resistant by streptomycin therapy It is unfortunate that no tubercle bacilli were isolated from the infant's mother, who was the probable source of infection since it would have been of great interest to compare the streptomycin resistance of her infecting organisms with that of the organisms isolated from her infant

SUMMARY

A case of miliary tuberculosis in a young infant yielded cultures of *Myco tuberculosis* showing a high degree of primary resistance to streptomycin The probable source of infection was the mother and neither mother nor baby had previously received any streptomycin

Resistant variant bacilli are usually very scanty in cultures made before the start of streptomycin treatment, but in the present case they were numerous

A simple vertical diffusion streptomycin sensitivity test is described which demonstrates higher degrees of streptomycin resistance than does the standard Dubos test, and also indicates the number of resistant variants present

The prognostic value of a streptomycin-sensitivity test on organisms isolated before the inception of strepto mycin therapy is emphasised, and a plea is made for the routine performance of a simple initial test such as the vertical diffusion test described

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THROMBOTIC "HYDROCEPHALUS" IN INSULIN THERAPY

JOHN DONNELLY
M.B Lpool, D P M
ASSISTANT PHYSICIAN

E J RADLEY SMITH
M S Lond, F R C S
VISITING NEUROSURGEON

CANE HILL HOSPITAL, COULSDON, SURREY

THROMBOSIS of the cerebral veins and sinuses has long been recognised and extensively reported Gowers (1893) classified it into primary and secondary types according to the absence or presence of local septic lesions The primary type, though comparatively rare, occurs in a wide range of diseases associated most often with the extremes of life, it occurs in marasmic and cachectic conditions, in protracted debilitating illnesses, in tuberculosis and typhoid, in conditions giving rise to increased concentration and increased coagulability of the blood (as in dehydration due to persistent diarrhœa), in blood disorders (such as leukæmia and chlorosis), and with low blood pressure, and it may present as part of the clinical picture in thrombophlebitis migrans The secondary type is associated with septic conditions of the face, scalp, and nasopharynx, and of the paranasal and mastoid air sinuses

In the past decade attention has been directed to primary cerebral thrombosis by its increasing recognition as a complication of pregnancy and the puerperium (Symonds 1931, 1937, Martin, 1941 Martin and Sheehan 1941 Stansfield 1942, Kendall 1948) Kendall reviewed the literature on cerebral vascular catastrophes in this connection since Ménière's paper in 1828

Symonds (1931) suggested the name otitic hydrocephalus for the syndrome of increased intracranial pressure, with a cerebrospinal fluid (C S F) of normal composition, caused by thrombosis of the superior longitudinal (sagittal) sinus arising as a complication of otitis media McAlpine (1937) proposed toxic hydrocephalus as a more inclusive title, since the identical picture was caused by infection in the nasal passages, he described five cases in which a "cold" appeared to play a significant ætiological rôle

The term hydrocephalus usually implies a gross excess of C S F either within the ventricles or in the sub arachnoid space Though the symptoms of thrombotic "hydrocephalus" are similar to those of hydrocephalus, it is doubtful if there is a great excess of C.S.F Two sets of findings point to this conclusion (1) where either ventriculography or encephalography has been done, as in some of McAlpine's (1937) cases and in two of those reported here, neither dilatation of the ventricles nor an undue amount of supracortical air was demonstrated; and (2) the striking relief of the symptoms, and the reduction of pressure to within normal limits by the removal of small amounts of C S F —in none of the present cases was more than 30 ml removed at any one puncture However, since there probably is an excess of C.S.F sufficient to cause the increase in pressure within the theca, and since this arises as a sequel to thrombosis of the venous sinuses, the title thrombotic "hydrocephalus" is ætiologically accurate and clinically descriptive

We describe here three cases of thrombotic "hydro cephalus" occurring as complications of insulin therapy, in which several factors may favour thrombosis.

FIRST CASE

Mrs A., aged 42, was admitted on Oct 18 1948 with ideas of persecution, and a recent history of auditory hallucinations She was evasive in her answers but in a clear state of consciousness

Insulin treatment began on Nov 17, and on 100 units of insulin she passed into her first coma on Nov 23, almost immediately she had a major epileptiform convulsion After immediate interruption with glucose by tube feed she regained consciousness with no residual signs On Dec 14 she had a secondary hypoglycæmia but rapidly recovered on taking glucose by mouth On Dec 15 and 18 recovery from coma was slower than usual On Dec 22—the 18th coma—she developed laryngeal spasm, with cyanosis, and breathing afterwards was depressed Nikethamide and oxygen were administered Recovery of consciousness was slow in spite of intravenous glucose, and she was drowsy for the rest of the day Her temperature at 6 P M was 100 8°F, pulse rate 84, and respirations 22 Next day she appeared fairly well, but treatment was not resumed until Dec 28 On Dec 29 she complained vaguely of numbness of face, hands, and legs her speech was slower than normal for her On Jan 1 she appeared to have slight spastic dysarthria but no objective signs were found Treatment was suspended, but in spite of symptoms of numbness and stiffness of the left side of her face, and numbness of both hands and of the right leg and foot no sensory or motor impairment was found on Jan 9 Treatment was therefore continued next day On Jan 12 she vomited her nasal feed and recovered slowly after intravenous glucose She seemed to have a little difficulty with her speech Though she remained active, pleasant, and sociable there was little improvement in her psychotic symptoms, and it was therefore decided to try combined insulin and E C T

ectroconvulsive Therapy —Electric convulsions were in d during the 32nd, 33rd and 34th comas (Jan 22, 24, 25) On Jan 26 she was more lethargic, she answered tions normally, but her speech was more dysarthric, and gait rather stumbling, and when she was asked to main her arms outstretched with her eyes closed, her right arm ed downwards and outwards She was disoriented for , saving the date was Oct 22 Over the next two days became more drowsy, she could be aroused to answer tions but was irritable No papilloedema was found

umbar puncture on Jan 28 produced clear C S F under a sure of 180 mm 20 ml. of C.S.F was removed containing lymorph, protein 20 mg per 100 ml, chloride 760 mg 100 ml Lange and Wassermann reactions were both tive Within an hour the patient began to improve, g less drowsy and answering questions quite brightly Jan. 29 she continued to improve, but on Feb 3 she ed to become drowsy again and by Feb 7 she was in the e state as on Jan 28 Lumbar puncture produced clear under a pressure of 300 mm and unchanged in position.

ramination of the blood showed red cells 3,540 000 per n white cells 9000 per c mm., Hb 66 per 100 ml, ar index 0 94 The differential white cell count was nal.

rogress —Over the next month she exhibited the same are—i e, increasing drowsiness, irritability and dis ntation, which was relieved temporarily by lumbar cture The C S F was always normal, there was a normal ckenstedt response and the physical signs were limited acial weakness, dysarthria, slight differences in the arms, slight stiffness in gait The plantar responses were or throughout The C S F pressure gradually fell on 17 it was 270 mm, on March 1 260 mm, on March 23 mm., and on April 12 130 mm. Radiography of the skull wed no abnormality

lectro-encephalography —Dr C C Evans, of Belmont spital, on Feb 25 reported as follows "Alpha rhythm bout 8 cycles per second and tends to be unstable Slower quencies, mainly in the theta range but sometimes in the ta range, are seen throughout the record in all areas but ve maximal amplitude in the parietal areas The normality is observed more in the transverse electrode ition than in the anteroposterior There is no significant mmetry There is a paroxysmal tendency This record s not suggest a cortical lesion but rather a midline deep ed disturbance, but the E.E G can throw no light on the sible pathology"

entriculography (E J R S) showed that there was no tation, asymmetry, or displacement of the ventricular em.

ollow up —The only residual physical symptom is the ibness of the face and hands She has complete amnesia the period from 1943 until the end of March, 1949, when increased pressure was disappearing

Thrombosis of the superior longitudinal sinus was gnosed on increasing drowsiness, increased intra- nial pressure with a normal C S F, gradual recovery h repeated lumbar puncture, and a normal ventriculo m The thrombosis was probably due to intimal nage either from the effects of insulin, or from the reased intravenous pressure produced by the spon eous fit on Nov 23, or from the laryngeal spasm l subsequent severe cyanosis on Dec 22 Dehydration st be considered an important factor, because through insulin treatment the patient lost much fluid by ating

The first symptoms and signs appeared on Dec 29—rty six days after the spontaneous fit and seven days er the laryngeal spasm—but they did not increase il the induction of electric convulsions on Jan. 22–25, er which they increased rapidly Moreover, the F pressure was 180 mm on Jan 28 and 300 mm Feb 7 Probably the early symptoms were due to ombosis in the cerebral veins but the electric con- lsions led to extension of the clot to the sinus or tinted a new thrombus in that vessel, obstructing the sorption of C.S F The pressure returned to normal 70–80 days

The residual lesions are those which first appeared, suggesting that thrombosis of the veins led to permanent damage of the cortex

SECOND CASE

Miss B aged 26, was admitted on April 4, 1949, with schizophrenia

Treatment —On April 11, 15, and 19 three electric convul sions were induced and on April 21 insulin treatment, starting with 20 units was begun On April 22 and 25 E C T was given in the evening the patient having recovered eight or nine hours earlier from the insulin administered in the morning On April 29 she had the first insulin coma on 140 units during the seventh treatment On the morning of May 6 she did not pass into coma on 220 units and in the evening she was given a further electric convulsion, during which a deep cyanosis developed, but she recovered normally On May 7 insulin 240 units was injected, and the patient was very restless until at 9 30 A.M, in the stage of sopor, she had a strong spontaneous epileptiform convulsion. The hypo glycæmia was immediately interrupted, and she had fully regained consciousness by 9 50 A M. At noon she felt very well At 4 P M she complained of an intense headache, especially in the frontal region felt dizzy, was unsteady on standing, and became drowsy There was slight papilloedema of both discs and the retinal veins were engorged more on the right than on the left There was gross peripheral defect in the fields of vision, more on the right than on the left The pupils were moderately dilated and reacted sluggishly and with small excursion to light and accommoda tion No diplopia, nystagmus, or paresis of the ocular muscles, no other cranial nerve defect observed Tendon reflexes on the right side, in both arm and leg, were exaggerated compared with the left, abdominal reflexes were absent, and the sense of passive movement in the great toe was defective on the left side

Lumbar puncture produced clear C S.F, pressure 280 mm Pressure on the left jugular vein produced a rapid rise in the manometer reading, but pressure on the right vein caused scarcely any rise Pressure was slowly relieved to within normal limits, examination of the fluid next morning showed protein 20 mg, glucose 72 mg, and chloride 730 mg per 100 ml

Progress —After removal of the fluid the patient rapidly improved and the headache was relieved, persisting longest at the vertex Her drowsiness disappeared with the head ache Her temperature was 98°F and pulse rate 80 On May 8 she was free from headache in the morning Blurring of the discs variable abdominal reflexes and tendon reflexes exaggerated on the right compared with the left were found During the afternoon the headache began to return, and she was unsteady on her feet.

Lumbar Puncture —On lumbar puncture on May 8 the level of the C S F rose abnormally slowly to 90 mm and showed good fluctuation with coughing Compression of the right jugular vein produced no rise, but compression of the left produced an extremely slow rise to 150 mm with a very slow fall on relaxation The C.S F contained protein 30 mg chloride 735 mg, and glucose 70 mg per 100 ml On May 9 there was no change in the clinical condition Lumbar puncture yielded clear C.S.F under a pressure of 230 mm. A Queckenstedt test gave a normal response on the left and an equal but much slower rise on the right The fluid showed no cells protein 20 mg chloride 710 mg, and glucose 70 mg per 100 ml

Progress —On May 11 she complained of severe headache and a rushing noise in the head and ears On May 12 she appeared more stuporose, had difficulty in comprehension, and complained of headache and of throbbing in the ears Papilloedema and altered reflexes were found as before, but there was also diminished hearing on the right side with impairment of air and bone conduction No signs of inflammation were found in either ear

Lumbar Puncture —On May 12 the manometer reading rose very slowly, taking over a minute to reach 80 mm. Pressure on alternate jugular veins produced no change in the level, but bilateral compression yielded a slow rise to 150 mm and an equally slow fall on relaxation Coughing produced a sharp rise and fall. The C S F contained a fair number of red cells one lymphocyte and protein 50 mg per 100 ml. These unusual findings from the Queckenstedt test were attributed to a block probably at the foramen magnum, and the increased amount of protein in the C.S.F

seemed to support this view Further, for the two days following the puncture the pulse rate, normally about 80, fell to 60

Progress —With the administration of 25% magnesium sulphate enemas the noises in the ears gradually disappeared and the headache and mental symptoms diminished During the next week the improvement was maintained and the headache decreased, but the papilloedema persisted

Electro encephalography —On May 17 Dr C C Evans reported a mild non specific abnormality throughout the record There is no evidence of a focal lesion This would suggest that the lesion, if present is deep and centrally situated rather than near the surface of either hemisphere

Lumbar puncture on May 21 yielded clear C S F under a pressure of 140 mm , with only a slight difference between the Queckenstedt responses The C S F was normal, with protein 25 mg

Ophthalmoscopy (Mr Maurice Whiting) on May 21 showed slight bilateral papilloedema, but the swelling was not above the retinal level

Encephalography by Dr F Reitman at Netherne Hospital on June 9 showed a normal ventricular system , no dilatation or distortion, and no undue amount of supracortical air

Follow up —The patient's condition appears to be stationary The papilloedema has almost disappeared, her tendon reflexes are exaggerated on the right, and slight diminution in the peripheral field of vision of the right eye persists Mentally there is no significant change

Venous sinus thrombosis was diagnosed on the epileptiform convulsion, followed within a few hours by severe headache, increased intracranial pressure associated with normal C S F , papilloedema persisting for some weeks, and altered tendon reflexes The diagnosis of a cerebral tumour was excluded by the subsequent course of the illness

It is thought that a partial block occurred at the foramen magnum, the temporary increase in protein and fall in pulse rate to 60 apparently justifying this supposition The increased C S.F pressure suggests that the superior longitudinal sinus was involved The pressure returned to normal limits within three or four weeks

THIRD CASE

Mrs C , aged 28, was admitted on Oct 13, 1948, with schizophrenia She was mute and negativistic at times, and preoccupied with auditory hallucinations

Treatment —Between Jan 7 and Jan 24 6 convulsions were electrically induced, and insulin treatment was begun on Jan 28 The first coma, on Feb 5, occurred on 160 units during the 8th treatment Three days later, after fifteen minutes of her 3rd coma, the patient had a spontaneous epileptiform convulsion Coma was interrupted with glucose by nasal tube and she was fully awake at 12 15 P M , appearing physically normal Insulin therapy was continued with no unusual features until her 34th coma on March 23 when she vomited the entire nasal feed Next day extreme restlessness was a feature of the coma, and intravenous interruption was necessary On the evening of March 25 she complained of not feeling well and treatment was interrupted On the 26th she seemed to have a limp of the left leg

As she did not improve mentally treatment was started again on April 6 E C T was given during coma, producing a major fit This was repeated on April 7, but only a tonic spasm developed Insulin alone was continued until April 18, when an electric convulsion was again induced during coma Combined shocks on April 19 and 20 produced only tonic spasms No more treatment was given

Progress —At first she was very restless, but over the next ten days she gradually became more withdrawn, lethargic and ultimately stuporose On May 2 a lumbar puncture was attempted , but, though the theca was entered, the needle was withdrawn because of the patient s struggles She had bilateral extensor plantar responses On May 3 she was more rational than at any time since admission but she was amnesic for at least her stay in hospital She was slightly dysarthric and walked with a limp swinging the left leg

Lumbar puncture yielded clear C S F under a pressure of 240 mm A Queckenstedt test was indefinite 20 ml of C S F was removed "Cells one lymphocyte occasional red cells Protein 30 mg per 100 ml , no excess of globulin chloride 760 mg , glucose 65 mg"

Central Nervous System —On May 4 the patient had blurring of the nasal margin of left disc, with engorgement of the right retinal veins , but, apart from the dysarthria no abnormality of the cranial nerves was observed Hoffmann's signs were present in both arms, and the tendon jerks on the left were much exaggerated In the legs the knee and ankle jerks on both sides were extremely brisk the left more so than the right, and both plantar reflexes were extensor She was less amnesic and less disoriented.

Progress —On May 6 she complained of a strained feeling over the frontal region , there was papilloedema of both discs , the reflexes were still very brisk, especially on the left the left plantar response was definitely extensor and the right was doubtful Lumbar puncture produced clear C.S F under a pressure of 160 mm On May 7 the limp had disappeared and she was less coöperative , the papilloedema was less but the other signs were unchanged On May 9 lumbar puncture produced normal C S F under a pressure of 120 mm Queckenstedt test normal

Electro encephalography (Dr Evans) on May 17 showed "a bilateral generalised abnormality which is non specific and of moderate degree Groups of slow frequency mainly of the theta range, are seen throughout the record This suggests that the lesion, if present, is probably deep and centrally situated, rather than near the surface of either hemisphere Patient not very coöperative, and no further localisation is possible"

Progress —On May 20 the papilloedema had subsided, and the reflexes in the arms were not so exaggerated, but the left continued greater than the right, while in the legs the reflexes were still very brisk, the left more marked than the right the left plantar response was extensor and the right doubtful The patient still complained of the strained feeling in the frontal area

Ophthalmoscopy (Mr Whiting) on May 25 showed temporal pallor on the right and some slight optic atrophy on the left

Follow up —The patient is amnesic for her stay in hospital but can remember everything from the time she "came round" after puncture on May 2 She is rational and active but shows no inclination to think about the future Her leg reflexes are exaggerated, and the left plantar response remains extensor

Thrombosis of the superior longitudinal sinus was diagnosed on increased intracranial pressure with normal C S F , papilloedema, weakness in both legs, and bilateral plantar extensor responses The initial neurological signs—limp and headache—suggest that the initial lesion was in a superior cerebral vein and spread later to the superior longitudinal sinus

FACTORS PREDISPOSING TO THROMBOSIS

Anatomy

There are usually eight superior cerebral veins draining into the inferolateral aspect of the superior longitudinal sinus on each side (O'Connell 1934) An anterior group passes upwards and slightly backwards, but a posterior group passes upwards and forwards, making the direction of flow partly against that in the sinus There is therefore in the posterior veins a tendency to stasis, which is accentuated when the patient lies a long time supine or when the pressure within the sinus is increased Both these factors occur in the puerperium and in insulin therapy

Increased Intravenous Pressure

Batson (1940) showed that blood from the pelvis and the legs may, when the intra abdominal and intra thoracic pressure is raised, pass by the vertebral veins to the intracranial sinuses The vertebral veins as they ascend, form a plexus which communicates not only with all segmental areas of the body but also with the basilar, sigmoid, and occipital sinuses (Brash and Jamieson 1943) Increased pressure within the abdomen and thorax, combined with the muscular contractions which take place in parturition and in epileptiform fits will cause both decreased outflow from the cranium owing to the rise in pressure in the jugular veins and redirection of the venous return greatly augmented by

the muscular contractions, to the cranial sinuses This may well overdistend the thin walled cerebral veins and thereby tear their endothelium (Kendall 1948)

Changes in Blood vessel Walls

At several necropsies after Sakel's insulin treatment changes in the blood vessels have been found, mostly in the arteries but sometimes in the veins and capillaries Though in most cases all the coats of the blood vessels have been affected, the greatest damage has fallen on the endothelium (Ferraro and Jervis 1939a and b, Kastein 1938, Gralnick 1941), as shown by proliferation of the intimal cells, which are swollen and show changes in the cytoplasm and nuclei

Thrombosis secondary to these changes has often been noted, it may affect veins of all sizes, and Kastein (1938) described a case of thrombosis of the superior longitudinal sinus

Other evidence of changes in the vascular walls includes ischæmic degeneration of the glomerular arterioles and capillaries (MacKeith and Meyer 1939), small hæmorrhages by diapedesis through the vessel walls, and alteration in the permeability of the blood C S F barrier (Kingsley and Freed 1941) It is therefore suggested that, as a result of alterations in nutrition, the intimal cells undergo changes, usually reversible, which may either in themselves lead to thrombosis or, in the presence of increased intravenous pressure, render the wall more susceptible to small tears

Changes in Blood

The injection of insulin is given at 7 A M, and hypoglycæmia proceeds until the coma is interrupted usually three or four hours later During this time many patients lose much fluid through profuse sweating and excessive salivation Dehydration and therefore concentration of the blood (Whitby and Britton 1946), especially of the cells and proteins (including fibrinogen), are likely to result Since 30–50 treatments are administered, the patient is exposed for a considerable time to these factors

FORMATION AND SITE OF THROMBUS

The thrombus may take a long time to become large enough to cause symptoms or clinical signs In the puerperal cases the symptoms have come on 4–137 days after parturition (Stansfield 1942) The intervals between the spontaneous hypoglycæmic convulsion and the onset of symptoms in the present three cases were 36 days, about 6 hours, and 45 days

The formation of the thrombus is supposed to start with a small lesion of the intima, which may be a change caused in the endothelial cells by insulin (as described above), a tear due to a rise in pressure in the superior longitudinal sinus (as postulated by Kendall 1948), or a combination of both Platelets, fibrin, and leucocytes are next deposited, forming a nucleus—a grey thrombus—on which other blood elements are laid at different rates If a vein is affected, the blood flow through it is slowed, eventually the lumen is occluded perhaps suddenly, and a red thrombus is formed The process may then extend towards and involve the superior longitudinal sinus Various types of thrombus in the sinus have been described multiple small mural clots (Symonds 1937), a layer of clot lining the wall without occluding the lumen (Gowers 1893), a long thrombus attached to the wall only at one end (Martin and Sheehan 1941), a thrombus occluding the lumen of the sinus but present only in the anterior or the posterior portion of the vessel (Martin 1941), or a clot filling the whole sinus

An aseptic clot soon becomes organised and canalised, with the re-establishment of the venous pathway, but the time taken depends on the type and size of thrombus The symptoms will be relieved in this way or by the development of a collateral circulation

PRODUCTION OF HYDROCEPHALUS

Excess of C S F may be caused by either increased formation or decreased absorption

The superior longitudinal sinus is triangular in cross section, with the apex below The superior cerebral veins enter the lower part of the sinus At its superolateral angle the sinus communicates with the lacunæ laterales, into which project arachnoid villi, from which C S F passes by osmosis into the lacunæ Therefore thrombosis along the superolateral angle of the sinus will block the entrances of the lacunæ and raise the pressure of the C S F Canalisation of the clot will restore the connection between the lacunæ and the sinus Before this happens the removal of excess C S F by lumbar puncture cures the hydrocephalus

Thrombosis in the lower part of the sinus, if at all extensive, is likely to block the openings of the cerebral veins and so raise the intracranial tension Then, unless an adequate collateral circulation develops, residual permanent damage due to cortical softening is likely to ensue in spite of repeated lumbar puncture

Experimental attempts to produce hydrocephalus by thrombosis of the longitudinal sinus in young dogs (Beck 1944) have met with little success, but in a few cases fullness of the retinal veins developed In dogs, however, the venous circulation is different and the collateral vessels can apparently cope easily with the blockage Presumably in man, unless a large proportion of the villi are obstructed, those that remain not obstructed may be able to compensate for the disturbance

SIGNS AND SYMPTOMS

Focal Signs

Thrombosis of a cerebral vein gives rise to local signs which depend on the part affected Unless other channels dilate to drain the area, softening of the cortex may ensue, with permanent damage In insulin therapy, as in the puerperal cases, various symptoms have been reported paræsthesiæ, monoparesis and hemiparesis, dysarthria, aphasia, and amaurosis, most of which clear rapidly (Spencer 1948) In three personal cases, including the present case 1, the patients complained of persistent numbness of the face and of the fingers of one or both hands Read et al (1939) reported a case of hemiplegia following insulin therapy which cleared up leaving a permanent left Hoffmann sign, left facial paresis, and exaggerated reflexes Though many of these symptoms and signs are due to the hypoglycæmia, some of them, especially those persisting for a considerable time after interruption of therapy, are no doubt due to vascular disorders

Epileptiform fits are a common but not invariable accompaniment of venous thrombosis, often occurring as presenting signs Martin (1941) suggests that if the superior longitudinal sinus is occluded before the vein, convulsions are less likely, owing to the opening up of the collateral circulation, or alternatively that the absence of convulsions may be due to the gradual onset of the obstruction

In insulin treatment major epileptiform convulsions are not uncommon in the early stages—i e, within 100 minutes of the injections Focal lesions following shortly after these are rare, and the fits must be attributed to the effects of hypoglycæmia We suggest that these convulsions may initiate the thrombosis by producing small lesions in the endothelium of the veins or the sinus

Signs of Increased Intracranial Pressure

Headache is considered to be very constant and early (Kendall 1948) and may be generalised or localised In the present three cases frontal and vertical headache was intense in one, one patient complained of a "strained feeling" in the head, and the third did not complain (though she may have had a headache) Papillœdema

may or may not be present in one of the present cases it was absent, and in the other two it was slight or moderate

The mental state varies also Many patients are alert in spite of severe papilloedema, &c, but all stages of impairment, from lethargy through drowsiness to stupor and coma, have been reported In psychotics the mental picture may be confusing Vomiting is often absent

Cerebrospinal Fluid

A marked and protracted increase in pressure of C S F almost certainly indicates thrombosis in the superior longitudinal sinus The composition of the C S.F is normal, and there is no increase in the amount of protein or in the white cell count, if bleeding has occurred red cells may be found

DIAGNOSIS

Sinus thrombosis is unlikely to be confused with many conditions Cerebral hæmorrhage and embolism have a more dramatic onset, and a cause for embolism can often be found Subarachnoid hæmorrhage and meningitis can be excluded on the C S F findings Cerebral tumour presents the main difficulty and ventriculography may be necessary

Thrombosis of the lateral sinus occurs most commonly with infection in the middle ear, and extension to the longitudinal sinus is relatively uncommon The Queckenstedt test applied to diagnose occlusion of the lateral sinus is unreliable (Woodhall 1936) In thrombosis of the longitudinal sinus even less reliance can be placed on it, owing to the extensive collateral circulation (O'Connell 1934) In the present series there was a normal finding in case 1, no significant differences in case 3, and in case 2 the responses varied greatly as recorded above

TREATMENT

Since a clot obstructing the entrance to the lacunæ laterales may become organised, with re establishment of a lumen, repeated lumbar puncture, to remove the unabsorbed fluid and to relieve the pressure until this is achieved, is the rational method of treatment The speed with which the headache and the drowsiness were eased by lumbar puncture was remarkable in two of the three cases, but the effects were temporary As the days pass, the height of the pressure falls gradually to normal.

In all thrombotic conditions the use of anticoagulants is now recommended to prevent further spread, none of these patients were so treated, but nevertheless all made a good recovery

Where cases present with repeated fits sedation is strongly indicated, especially since each convulsion would worsen the condition Although each of these patients had a spontaneous convulsion during hypoglycæmia, none has shown a tendency to epilepsy since the conclusion of treatment, in spite of the absence of anti convulsant therapy

Little can be done, or indeed appears necessary, for residual symptoms due to local venous thrombosis Recovery, if it takes place, proceeds uneventfully

PROGNOSIS

Most cases of primary venous thrombosis of the dural sinuses are associated with other diseases which are themselves often fatal The mortality rate in the puerperal cases, which appear the most closely related to those reported here, has been calculated by Kendall (1948) to be about 30%, but he considers that wider recognition of the thrombosis will lower this figure considerably We have been unable to trace any published records of thrombotic "hydrocephalus" complicating insulin treatment of psychotics diagnosed during life, but the necropsy reports do indicate that the condition may have passed unrecognised, and we suggest that among the deaths attributed in the past to "hypo glycæmic encephalopathy" may have been some due to thrombotic "hydrocephalus"

Residual effects due to damage of the cortex may persist, but recovery, when it takes place, seems generally to be complete Numbness of the face and hand, slight differences in reflexes, and slight optic atrophy, none of which inconvenience the patient, have remained as permanent effects in one or other of the present cases.

DISCUSSION

In these three cases the thrombosis was associated with epileptiform convulsions, spontaneous and induced The combination of electric convulsions and insulin is a well recognised therapy that may produce results where either alone is ineffective (Sandison and McGregor 1942, Barahona Fernandes and Polonio 1946, Freudenberg 1947, Sargant 1947)

In a case described by Kastein (1938), thrombosis of the superior longitudinal sinus was discovered at necropsy after a course of insulin therapy in which the patient had an epileptic fit In his case and in ours, convulsions, spontaneous or induced, developed during the course of hypoglycæmic treatment The intervals between the spontaneous fits and the onset of clinical manifestations varied but made it likely that in two cases at least the convulsions were an ætiological factor rather than an indication of the thrombosis

Though we emphasise the importance of the fits we do not suggest that the convulsions alone are responsible for the thrombosis Electric convulsions are a routine treatment in mental disorders, yet neurological lesions are rare, and such as have been reported are attributed to hæmorrhage or to embolism We therefore postulate that in insulin therapy there are produced conditions eminently conducive to thrombosis (1) the endothelium of the blood vessels suffers changes which alone may be sufficient to initiate thrombosis but which will in any case render the venous intima more liable to damage from overdistension during a convulsion, (2) the hypo glycæmia may induce a fit and thus increase the intra venous pressure, and (3), if a lesion has developed, stasis and hæmoconcentration will favour the development of thrombosis

The occurrence of three cases within so short a period suggests that the combination of electric convulsions and insulin renders the patient more liable to thrombosis of the cerebral veins and sinuses, and reinforces the conclusion that the fits, however caused, are of ætiological significance

SUMMARY

Thrombotic "hydrocephalus" is suggested as the name for the clinical syndrome arising from thrombosis of the superior longitudinal venous sinus Three cases of this syndrome arising as a complication of insulin therapy are described

Factors predisposing to venous thrombosis are examined, and the site and formation of the venous thrombus are discussed The production of "hydro cephalus" by thrombosis of the longitudinal sinus is examined with particular reference to anatomical and experimental findings

The symptoms of thrombosis of the superior longitudinal sinus are briefly presented, and the differential diagnosis, with particular attention to Queckenstedt's test, is discussed

The suggestion is made that convulsions are of ætiological importance, particularly when associated with the changes produced by insulin therapy

We wish to thank Dr A Walk, medical superintendent Cane Hill Hospital, for permission to publish the cases here described, and Dr C Dax and Dr L Minski for facilities for radiological and electro encephalographic investigations

References at foot of next column

PULMONARY FIBROSIS FOLLOWING GRANULOPENIA

JOHN FRIEND
M.D Lond , M R C.P
SENIOR REGISTRAR, PROFESSORIAL MEDICAL UNIT

A C THACKRAY
M.A , M D Camb
ASSISTANT PATHOLOGIST

THE MIDDLESEX HOSPITAL, LONDON

WE report here two cases of severe postirradiation bone-marrow depression complicated by bronchopneumonia which showed, post mortem, considerable organisation

Case 1 —A man, aged 59, was admitted on Jan 13, 1949, with six months' history of a generalised painless enlargement of superficial lymph glands No other abnormality was found. A blood-count on Jan 14 showed Hb 102%, white cells 6900 per c.mm (neutrophils 71%, lymphocytes 22%, monocytes 6% eosinophils 1%)

Biopsy of an axillary gland showed a giant follicular lymphoblastosis with areas of rapid growth suggesting lymphosarcomatous change

X ray therapy was begun on Feb 15, a strip field technique being used, and was completed on March 8 1949 White cell counts showed 2100 cells per c mm on March 9 and 900 per c.mm on March 14 The patient exhibited no notable symptoms or signs of this considerable leucopenia, and unfortunately a differential count was not done then

March 16 the total white cell count was still only 1000 cells per c.mm., and the patient developed pyrexia for the first time, his temperature rising to 104°F the following day and never falling entirely to normal before he died Treatment with penicillin 100,000 units four hourly was begun on March 16, when he had a purpuric rash in the skin, more marked at points of pressure and tending to occur especially at sites of injection Examination of his chest revealed no abnormal physical signs, but a chest radiogram on March 23 showed consolidation in the left upper and right mid zones The following day the purpura had increased and the patient had severe epistaxis A blood count on March 24 showed Hb 63%, white cells 2300 per c mm (neutrophils 74% lymphocytes 18% monocytes 7%, eosinophils 1%) and platelets 6000 per c.mm. The clotting time was 4 minutes and bleeding time longer than 15 minutes The patient was transfused with two pints of fresh blood and his general condition improved, hæmoglobin rising to 80% but the pyrexia continued although the dosage of penicillin was increased on March 25 to 250 000 units four hourly and streptomycin 0·5 g was given four hourly

March 28 a blood-count showed Hb 68% white cells 2000 per c.mm. (neutrophils 58% lymphocytes 40%, monocytes 2%) and platelets 510 000 per c.mm On this day there were gross signs of consolidation in the left upper zone of the chest anteriorly and in the right mid zone posteriorly Radiography showed no change in the last five days

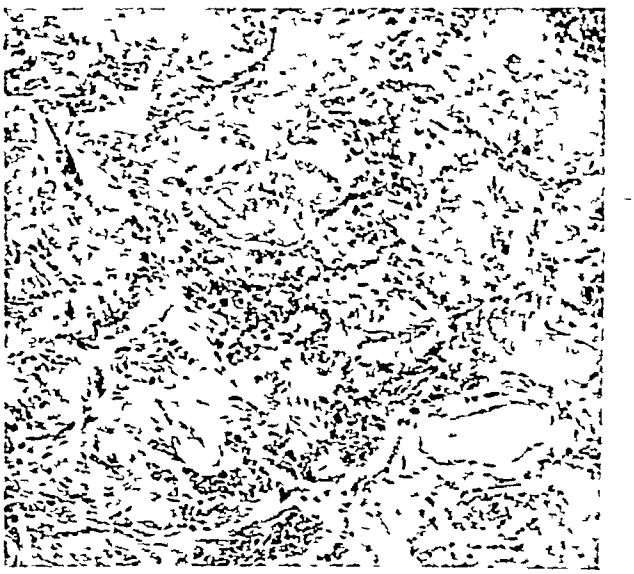
March 29 the sputum gave a profuse growth of coagulase positive *Staph aureus* and α hæmolytic streptococci.

On March 31 the patient was transfused with a further two pints of fresh blood when his general condition was deteriorating rapidly

April 4 the purpura had again increased, and signs of heart-failure had appeared the physical signs of consolidation in his lungs remaining the same

April 6 the patient died, the total white cell count having fallen to 840 per c mm. twenty four days after the known onset of his granulopenia

Necropsy —The body was that of a well developed elderly man with numerous petechial hæmorrhages scattered over the skin surface Internally, enlarged mediastinal lymph-glands up to 1 in in diameter were all that remained of the previous generalised glandular enlargement Only the changes in the lungs with which we are particularly concerned, will be mentioned here Each pleural space contained about a pint of amber fluid, with thickening of the pleural surfaces There was widespread almost confluent, consolidation of both lungs, sparing only parts of the lower lobes On section the upper lobes resembled lobar pneumonia in its later stages, except that the cut surface was rather moister Many portions of the lung sank in water



Section of lung from case 1 showing advanced organisation of fibrinous exudate in alveoli (× 85)

Histology —The great majority of the alveoli contained exudate in the process of organisation only occasional dilated air-containing alveoli being present (see figure) Recognisable fibrin, often hyaline occupied some of the air sacs though most were filled by young fibrous tissue No bacteria were seen and only very occasional polymorphs Moderate numbers of mononuclear cells often with large and irregular nuclei were present Diagnosis fibrosis of lungs follicular lymphoblastosis

Case 2 —A girl, aged 18 had attended the radiotherapy department of Bristol Royal Hospital on Sept. 30 1948, with three months history of a swelling of the left side of the neck, followed by a sore throat and the appearance of a small gland in the left supraclavicular fossa At that time she had been found to have a mass of enlarged matted glands in the left side of the neck from the mastoid process down to the sternoclavicular angle Biopsy had shown lymph gland with extreme lymphoid hyperplasia and loss of normal architectural pattern consistent with lymphosarcoma or lymphatic leukæmia X ray treatment had been given to the neck from Oct 4 to Oct 15 1948 total dosage of 1500 r to both sides of the neck. Six weeks later the glands had recurred, and a chest radiogram had shown a left pleural effusion. Radiotherapy to neck and left axilla had been started again on Feb 1 1949, and treatment completed seven days later The patient had then come to London and been admitted to the Middlesex Hospital on May 2 1949

On admission she complained of cough and dyspnœa on exertion and examination revealed a generalised superficial

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painless lymphadenopathy and signs of a left pleural effusion A blood count showed Hb 100% white cells 3600 per c mm (neutrophils 32%, lymphocytes 45%, monocytes 3%)

X ray treatment was suspended after only six days because the white cell count fell rapidly, but it was begun again on May 16 1949

May 20 the sternal marrow showed extensive infiltration with lymphocytes (which constituted 94% of the total nucleated cell count of 196,000 per c mm) which had taken the place of the normal marrow tissue These findings strongly suggested lymphatic leukæmia or lymphosarcoma X ray treatment was continued, and the lymphadenopathy subsided rapidly, the patient s general condition being satisfactory, with a white cell count of 5000–8000 per c mm

July 13 a pustule appeared on the right cheek, from which coagulase positive *Staph aureus* insensitive to penicillin and sensitive to streptomycin was isolated Radiotherapy was again withheld

July 15 the patient's temperature rose to 105°F with the maturation of the skin lesion, and a blood-count showed Hb 57%, white cells 2000 per c mm (neutrophils 1%), and platelets 50,000 per c mm The patient was transfused with one pint of fresh blood Treatment with penicillin 50,000 units four hourly had been begun on July 13, and, when the granulopenia was found by this blood count, the dosage was increased to 500,000 units four hourly, and streptomycin 0 5 g six hourly was given in addition

July 17 radiography showed the pleural effusion to remain the same, and there were rounded opacities in the right second and third intercostal spaces

July 19 spontaneous bruising beneath the left clavicle and a small petechial hæmorrhage on the back were found At the right lung base were many coarse râles and a loud pleural rub The patient became progressively more ill, jaundiced, and died on July 23, 1949

Necropsy —The body was that of an intensely pale and slightly jaundiced girl, with numerous petechial hæmorrhages over the front of the chest, and enlarged glands visible in the neck Internally, the lymph glands of the neck, mediastinum, and abdomen were all enlarged up to 1 in in diameter, and there was some enlargement of the liver and spleen The left pleural space contained about 3 pints of bloodstained fluid, rather less on the right The left lung was collapsed from pressure of the effusion, and its pleural covering was thickened and contained numerous small hæmorrhages The right lung was firm as if consolidated, though slightly nodular on palpation, and its pleura was thickened, roughened, and in one or two places adherent to the chest wall On section the lung resembled a lobar pneumonia in the stage of red hepatisation, though moister and less uniform

Histology —Some alveoli were packed with red cells, others were filled with a fibrin network or albuminous fluid, and in others the fibrin was being invaded by young fibroblasts Occasional large clumps of bacteria buried in fibrin were seen, especially in the exudate covering the pleural surface Only very rarely were polymorphs seen but many large mononuclear cells were present, and in places the alveolar lining cells were enlarged to form a conspicuous layer Towards the periphery of the lung were some normally aerated alveoli Most of the bronchioles had lost their epithelial linings and contained fibrin and mucus Diagnosis lymphatic leukæmia, post irradiation granulopenia, and confluent hæmorrhagic bronchopneumonia, with early organisation

DISCUSSION

References to the lung changes in granulopenia are scanty Those we have consulted report commonly a hæmorrhagic bronchopneumonia with or without necrosis of the lung (Rotter 1925, Schaefer 1926, Hueber 1930) Some workers have found a pulmonary œdema (Morgan and Detweiler 1939 Tragerman and Goto 1939), and only infrequently has any chronic inflammation been noted Baltzer (1926) states that in one of his cases there was hypertrophy of connective tissue and of alveolar epithelium In the pneumonia of granulopenia an intra alveolar fibrin network has been described by Empey and Proescher (1932) and Schwager (1938) The patients in these cases, reported before the general use of antibiotics in the therapy of granulopenia survived generally less than ten days

We regard the lung changes seen post mortem in both our cases as examples of almost confluent bronchopneumonia as modified by granulopenia and antibiotics. The presence of bacteria and polymorphs usually indicates the inflammatory origin of a fibrinous exudate Although few were seen in the lungs of our cases, all the features being taken into account, there was no danger of confusion with certain non inflammatory conditions in which a fibrinous exudate enters the lung alveoli, such as uræmic pneumonia (Doniach 1947) In this condition a passive transudate associated with heart failure is unusually rich in fibrinogen, a result possibly of the action of uræmic blood on the vessel walls, and masses of fibrin subsequently organised to fibrous tissue, fill the alveoli Although this condition has been called uræmic "pneumonia," the absence of inflammation is an essential feature

The polymorphs are generally believed to play a major part in the resorption of fibrin in the process of resolution In our cases the fibrosis of the lungs can reasonably be attributed to the granulopenia

Thrombocytopenia may have contributed to the hæmorrhage into the lung alveoli but was of relatively short duration The term "agranulocytosis" has been purposely avoided here because it implies the complete absence of circulating polymorphs and is rare in its fully developed form It seems that the resorption of fibrin can be interfered with by a reduction of granulocytes to the levels seen in these cases and short of complete agranulocytosis

In the past, agranulocytosis or severe granulopenia has usually been fatal within a short time With recent advances in chemotherapy we can expect to see more patients with associated bronchopneumonia surviving long enough for organisation to occur in the lungs, and for fibrosis of the lung to be recognised as a serious complication of granulopenic pneumonias

We wish to thank Prof B W Windeyer, Prof A Kekwick, and Dr A Willcox for permission to publish notes of these cases, and Prof R W Scarff for his help and advice

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PREVENTION OF HÆMOLYSIS DURING FREEZING AND THAWING OF RED BLOOD-CELLS

A U SMITH
M B, B Sc Lond
From the National Institute for Medical Research, Mill Hill, London

FROZEN and freeze dried serum and plasma can be used therapeutically after storage for many months or even years [4 5 1 20] By contrast, whole blood or separated blood cells can be stored in vitro only at temperatures between + 2°C and + 8°C and for no longer than 4 weeks before transfusion [1 6 9 17 19 20] So far no method satisfactory for use on a large scale has been described for preventing the hæmolysis which occurs during freezing and thawing Thus, Luyet's technique [10] of freezing thin films of blood at — 196°C, or Strumia's method [11] necessitating rigid temperature control of the frozen blood at — 3°C, are mainly of academic interest, while the cells which survived freezing and thawing in the experiments of Griffits et al [6] had increased fragility

The purpose of this communication is to report the action of glycerol in preventing hæmolysis due to freezing

and thawing Glycerol preserves the motility of spermatozoa[12–14] subjected to low temperatures It has also been used in experiments on the preservation of viruses[11 16] and sarcoma cells[2 3] With red blood corpuscles glycerol in low concentrations (3% approx) has often been used as a hæmolytic agent[7] It was surprising, therefore, to find that in heparinised guineapig blood or rabbit blood mixed with equal volumes of semen diluents composed of buffered glucose saline solutions containing 10%, 20%, or 30% of glycerol, the corpuscles appeared microscopically unaltered in shape and size after a few minutes and after 1 hour at room temperature The samples were then frozen at − 79°C, and 1 hour later thawed at − 40 C The tubes containing final concentrations of 5% glycerol showed considerable hæmolysis, whereas with 10% and 15% glycerol there was little hæmolysis and the corpuscles were neither crenated nor obviously swollen

A series of experiments was then carried out with samples of heparinised rabbit blood diluted with equal quantities of mixtures of glycerol in Ringer's solution, and glycerol in 0 85% NaCl The results showed that with final concentrations of 10% or 15% glycerol the blood could be stored for 7 days at + 2°C without appreciable hæmolysis After freezing quickly to, and storage at, − 79°C for 5 minutes, 1 hour, 18 hours, 3 days, 4 weeks, 6 weeks, and 3 months, and subsequent thawing at − 40°C, most of the red blood corpuscles survived and were unaltered in shape The results with 5% or 20% glycerol were less satisfactory Control samples diluted with Ringer's solution or 0 85% NaCl showed almost complete hæmolysis on thawing After cooling glycerol treated blood to − 79°C slowly during 30 minutes or 1 hour, the red cells were slightly less well preserved

The process of hæmolysis during freezing and thawing of blood without glycerol, and its prevention in the presence of glycerol have been studied under the microscope,[15] and were illustrated in a film shown during a symposium on the Freezing and Drying of Animal Cells, held at the National Institute for Medical Research in June

In these preliminary experiments only one specimen of human blood was tested 0 5 ml samples were diluted with equal volumes of 30% glycerol in Ringer, to give a final concentration of 15% glycerol, and then frozen at − 79°C When thawed after 2 hours, 24 hours, 1 week, 2 weeks, and 8 weeks, the red cells appeared little altered microscopically, and on centrifuging the colour of the supernatant fluid indicated only a slight degree of hæmolysis It remains to extend the in vitro work on human material and to investigate the behaviour of red cells so stored when reintroduced into the blood stream

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Pneumonia

PNEUMONIA was discussed at a meeting, on Dec 15, of the section of epidemiology and State medicine of the Royal Society of Medicine

Dr W H BRADLEY, president of the section, pointed out that during the past thirty years both notifications and deaths had decreased, the death rate had begun to fall even before 1938, when chemotherapy was introduced

Dr J G SCADDING discussed the classification of pneumonia in the light of knowledge concerning ætiology He distinguished first the various aspiration pneumonias, including hypostatic, terminal, and postoperative conditions, and then subdivided the broad group of acute specific pneumonias according to their several ætiological agents The bacterial pneumonias due to pneumococci, hæmolytic streptococci staphylococci, Friedlander's bacillus, and the tubercle bacillus, each had distinctive clinical features The virus pneumonias could be subdivided into (1) those where bacteria were also concerned, as influenza and measles, and (2) those due to viruses alone, including psittacosis, ornithosis, and other unidentified pneumotropic agents Pneumonias due to rickettsiæ, such as Q fever, and to fungal and plasmodial causes were much less common

Dr Scadding thought that aspiration pneumonias, which might occur in bronchitic subjects or after an acute upper respiratory infection, were often confused with virus pneumonias The main characters of virus pneumonias were prominent constitutional, rather than respiratory, symptoms, lack of response to penicillin, normal leucocyte count, and a radiographic opacity whose distribution was neither segmental nor lobar The cold agglutinin titre might be high At Hammersmith Hospital, London, during the winter of 1949–50, ætiological agents were sought in 110 cases of pneumonia In 46 cases no pathogenic agent was found, though mouse inoculation of sputum was not practised at first Pneumococci were identified in 29 cases, staphylococci in 10, and the tubercle bacillus in 4 Serological evidence of influenza B was found in 11 cases, and high titres of cold agglutinins in 10 Of the 27 cases in which agents could not be identified even before chemotherapy was begun, 18 had segmental or lobular changes, 10 being in bronchitic subjects and 4 following an upper respiratory tract infection

Prof C H STUART HARRIS described investigations carried out in Sheffield in the winters of 1947–48 and 1948–49 which were designed to clarify the relation between influenza and pneumonia Epidemiologically these two winters were different, in the first there was no influenza epidemic, whereas between February and April, 1949, there was a sharp outbreak of influenza A In the first year, 85 cases of pneumonia or bronchitis were investigated bacteriologically and for evidence of influenza virus, and in the second period, between January and April, 1949, 95 cases were similarly studied The age distribution in the two series was similar except that there were more subjects over the age of 65 in the second (influenzal) period, and during this time the number of females studied was also higher

Only 2 sporadic cases of influenza A were detected in the first year, but during the epidemic period 30

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strains of virus A were recovered, and positive serological results were numerous Of 17 fatal cases of pneumonia, 9 yielded virus and 6 staphylococci as well Of the 53 non fatal cases of pneumonia investigated during the epidemic, 11 showed rises of influenzal antibody during their progress, and another 9 had on admission high titres of antibody indicating recent virus infection Pneumococci or staphylococci were both recovered from the sputum in the virus positive cases Only in the staphylococcal cases did the clinical evidence suggest a synergic virus bacterial relation The types of pneumococci concerned did not differ significantly in the two years, but in the whole period 75% of 117 strains fell into types I–VIII Professor Stuart-Harris referred to the low carrier rates in normal people for these types except type III, the rate was, however, higher in the immediate environment of cases of pneumonia due to these organisms He suggested that carriage of pneumococci and preceding non-bacterial respiratory infection were both concerned in the genesis of pneumonia

Dr B P MARMION described the results of an examination of 690 sera received during 1949–50 at the Central Public Health Laboratory, Colindale, from all over the country, and from cases of pneumonia at the Hammersmith and West Middlesex hospitals Clinically the cases were grouped as influenza (112), lobar pneumonia (108), bronchopneumonia (83), atypical pneumonia (322), and pyrexia of unknown origin (P U O) (65) 27 cases of influenza were positive for virus B, and so also were 15 lobar pneumonias and 6 bronchopneumonias, 51 atypical pneumonias, and 8 cases of P U O The influenza B cases were grouped in time between the end of January and the beginning of May, 1950 Q fever antibodies were found in 23 cases, clinically, 18 of these were atypical pneumonia, 2 influenza, and 3 P U O Serological evidence suggestive of psittacosis was obtained in a few cases in all clinical categories Cold agglutinins in titres exceeding 1 in 128 and *Streptococcus M G* agglutinins in titres exceeding 1 in 40 were found in 11 cases of bronchopneumonia and in 67 of the atypical cases—a total of 9% of all specimens from cases of pneumonia

Dr BRADLEY questioned Dr Marmion regarding the *Streptococcus M G*, which is a non hæmolytic streptococcus first recovered from the lung or sputum from cases of atypical pneumonia in the U S A Dr MARMION said that sera from cases of atypical pneumonia contained both agglutinins and precipitins for the *Streptococcus M G* but would also fix complement in the presence of normal tissue suspensions Dr F O MACCALLUM pointed out that the *Streptococcus M G* had not been isolated in Great Britain, and also referred to the recent discovery in the U S A of a new antigenic type of influenza virus unrelated to either virus A or B

Dr PERCY STOCKS spoke of the statistician's three nightmares hypertension, heart disease, and the influenza pneumonia conglomerate It had been decided to continue to classify influenza with the group of acute respiratory diseases rather than with the virus diseases

Dr STANLEY BANKS drew a parallel between the fall in incidence of the streptococcal diseases and of the pneumonias

Dr R E SMITH appealed to clinicians to define their cases of pneumonia more carefully and to withhold chemotherapy from the benign cases now seen in adolescents and children, he felt that the severity of pneumonia in this group had greatly lessened even before the introduction of chemotherapy

The meeting registered approval of the present classification of pneumonia from the standpoint of notification, and disapproval of any change at present to include atypical pneumonia in the notifications

Reviews of Books

The Diagnosis of Salmonella Types

F KAUFFMANN, M.D, chief of the International Salmonella Centre, Copenhagen Springfield, Ill Charles C Thomas Oxford Blackwell Scientific Publications 1950 Pp 86 16*s* 6*d*

THIS book is a practical guide to bacteriological methods by which a few experts, principally in Denmark, England, and the U S A, have separated a single bacterial genus into 196 species To the physician it matters little which of these, unless it be *Salmonella typhi*, infects his patient To the epidemiologist, however, this multiplicity presents ways of tracing infection which have on occasion proved useful, though limited in application by the fact that at one time and place the majority of salmonella infections are due to one or two species Lastly, to the bacterial geneticist this genus and the serological interrelation of its species offers an almost untouched field

Those who intend to distinguish the species of salmonella must have this book, but despite the clear and workmanlike exposition we doubt whether the tyro, with no other aid, will get far, for there is an art as well as a science of bacteriology The "average" bacteriologist will be grateful to Dr Kauffmann but also glad that he can call on a Salmonella Reference Laboratory to unravel his tangled skeins

Worth & Chavasse's Squint

(8th ed) T KEITH LYLE, C B E, M CHIR, F.R C.S, surgeon and medical officer in charge, orthoptic department Westminster branch, Moorfields, Westminster and Central Eye Hospital London Baillière, Tindall, & Cox. 1950 Pp 319 35*s*

Worth's classical *Squint*, an easily read statement of fact, went through six editions under the hand of its begetter The seventh edition was entirely revised by Bernard Chavasse, under whose hand it became much more complicated Many foundered in their attempts to assimilate its new ideas of the binocular reflexes and their physiological basis, its chapters on comparative anatomy, and the teachings of Sherrington and Pavlov In this, the eighth edition, Mr Keith Lyle has given it yet another character It is still no easy reading, but the reader is rewarded with a new outlook on the ætiology of squint in terms of developmental anomaly Mr Lyle places orthoptics in their right position—invaluable in diagnosis, less valuable in treatment He urges early operation so that under ideal conditions the squint is corrected before the age at which orthoptics can be used, and makes it clear that long courses of orthoptics divorced from hospital practice—or even associated with it—are a time consuming anachronism No ophthalmic surgeon can fail to benefit from reading this book

Hämolyse und Hämolytische Krankheiten

CONRAD MAIER, Oberarzt der medizinischen, Universitäts poliklinik, Zürich Berne Huber 1950 Pp 316 Sw fr 21 80

THIS volume begins with a chemical and physical description of the red blood cell and its contents

Figures are given to show that some hæmolysis proceeds all the time Normal serum contains 1–10 mg of hæmoglobin per 100 ml and in some anæmias not usually classed as hæmolytic this figure may be increased in pernicious anæmia for instance, figures up to 45 mg are recorded and such patients are thought to respond relatively poorly to specific treatment Dr Maier still devotes much space to Barkan's 'easily split off iron' though the modern view is that this is an artefact Full details are given of the various tests applied to the study of red cells Mechanical fragility gets no fewer than 10 pages and lysolecithin resistance 6 A brief but notably complete section on immune bodies that cause hæmolysis is included and a neat figure makes clear the action of incomplete antibodies

Rather more than half the book is given over to the physiological matters Then follows an excellent classification of hæmolytic diseases, including some syndromes

ot usually recognised in this country as separate ntities The discussion of the diseases listed makes up e rest of the book and it is much less complete than e list itself

The space given to the various diseases seems to depend the author's interest rather than on their relative clinical portance For instance Marchiafava s nocturnal hæmo obinuria has 10 pages, and 'hämolytische Anämie Typus ottit 5½ whereas all the conditions due to Rh incom tibility are dismissed in 2 pages and the discussion of e difficult subject of acquired hæmolytic anæmias is nilarly sketchy There is a good bibliography with proper ference to American and British work up to 1950

Within its limits this is a sound and succinct discussion the subject The physiology and biochemistry is ronger than the clinical section.

one and Joint Radiology

E. MARKOVITS, M D head of radiologic department Elizabeth Hospital Budapest New York and London Macmillan 1949 Pp 446 £7

Dr Markovits when chief of the principal radiological partment in Budapest in happier days produced two ccessful synopses of diagnostic radiology Descriptive rms for radiological appearances are very limited d certainly in English this branch of medicine cannot adequately dealt with by the synoptic method This w volume is a cross between a synopsis and a text-ok, and covers the whole field of bone and joint thology in considerable detail The presentation in ular form is very well done For each disease there a brief description of the pathology This is followed a radiological description which is in a set pattern e all diseases The major sub headings describe anges in the form the outline and the structure of the me Characteristics peculiar to the localisation in a at or long bone or in the skull are then dealt with in tail At the end of each section there are numerous ifferential diagnostic tables and classifications which ould be very helpful to the student The book is berally illustrated by line drawings and radiographs, ut some of the illustrations are not quite up to the andard of the text. The English is excellent, and there no doubt but that the author has succeeded in present-g clearly and simply a vast amount of knowledge book is very expensive, but well worth the money

edical Entomology

(2nd ed) ROBERT MATHESON Cornell University New York Comstock London Constable 1950 Pp 612 54

Professor Matheson s textbook first appeared in 1932 ch group of insects is allotted one or more chapters, d the relation of the group to human disease is cussed and often summarised in tables The greater t of the detailed information being concentrated in se tables, the author is left free to write a readable t.

he American origin of the book has influenced the amount pace allotted to different groups ticks are handsomely ed, and the British reader may think the treatment of ies and mites over-generous compared with the er short chapter on their blood-sucking allies Professor theson is perhaps a little inclined to give solemn warnings out making clear exactly why they are necessary He eptical about the efficacy of pest destruction as a means controlling insect flies but does not decide an example the actual use of the method This his objection that e destruction "does not seem worth while as domestic mals may also serve as reservoirs" is made out to be a which pest destruction has been a preliminary to the modernisation of domestic animals In the same way his ussal of the drugs used in treating trypanosomiasis is ... ... African experience His warning ... "all the newer insecticides ... be used with care" ... have been supported by giving them a chapter ... their own

As a guide to the insects of medical importance this k should be useful to both doctors and entomologists an account of it with the insect or the entomologist s in the field it has some notable gaps

A Pattern for Hospital Care

ELI GINZBERG PH D director of the New York State Hospital Study New York Columbia University Press London Oxford University Press 1949 Pp 368 36s

Professor Ginzberg of the Graduate School of Business of Columbia University with a staff of social scientists and statisticians, has made a survey of hospital care and finances in New York State His report covers acute general hospital care care for patients with tuberculosis, mental illness and other long term illnesses and care for inpatients and outpatients The earlier detailed part of the book is heavy going for the English reader who is apt to be unmoved by the problems of New York State, but later the subject matter widens in scope and the chapters on hospital staff appointments supervision of the standard of medical care and principles of internal administration are more easily read The key factor of administration is the quality of management but Professor Ginzberg points out that in a hospital there are three centres of power none of which is closely integrated with the other The board of trustees possesses the formal power the doctors are the key professional group but other groups such as the nurses may have secured a high degree of autonomy Hence the importance of the hospital administrator Yet

> the Board of Trustees seldom makes a specific delegation of authority to the administrator and when it does often fails to support him should he encounter difficulties in dealing with the doctors or nurses On the other hand the board frequently interferes with the administrator by interjecting itself into his work.

Professor Ginzberg therefore urges that the salary scale of hospital administrators should be raised so as to interest a superior type of person in this career He suggests that the position might be similar to that of the president of an American university

Atlas der Haut- und Geschlechtskrankheiten

Prof W FRIEBOES late director of the University skin clinic Berlin Prof W SCHONFELD director of the university skin and V D clinics, Heidelberg Stuttgart Thieme 1949 Pp 266 DM 60

THIS comprehensive atlas of skin and venereal diseases contains well over 400 illustrations, chosen with skill. All the more common diseases are represented by a series of pictures showing their varieties rare and very rare diseases including those of the nails are shown in at least one or two pictures There are a few omissions, such as erythrasma poikilodermia and Paget s disease of the nipple Over 300 of the illustrations are beautifully reproduced from colour photographs those of the diseases of the mouth are particularly impressive Dermatologists and venereologists will find the book valuable for teaching purposes, and general practitioners will welcome it as a work of reference.

Compulsion and Doubt

Vols I and II WILHELM STEKEL, M.D Translator EMIL GUTHEIL, M.D London Peter Nevill 1950 Pp 647 36s

THIS work displays the exceptionally wide range of Stekel s experience the intuitive approach the penetration, the impatient energetic therapy and the egotism which were responsible for his fame and his isolation No one except Janet has devoted so much attention to obsessional disorder, and the case-histories which make up a large part of these two volumes afford a vivid picture of its symptoms and psychopathology Of the treatment they give a less satisfying account doubtless because Stekel was a therapist who moulded data and methods to fit his artistic idiosyncrasy This attitude may be responsible for some of the odd statements which appear here, sometimes as obiter dicta, sometimes as emphatic generalisations thus there is frequent reference to the 'poison-complex," which is finally said to be demonstrable in the psychic structure of almost every case of compulsive disorder The arrangement of the chapters seems haphazard, the translator provides a corrective for this, however, in his preface which resumes Stekel s views systematically Though

the book is unsatisfying to the critical reader, it is a storehouse of clinical material, and the outcome of much psychotherapeutic practice

The Liver

Porta Malorum (*The Gateway to Disease*) KASPER BLOND, M.D, late first assistant, Rothschild Hospital, Vienna, DAVID HALER, M B, hon consulting pathologist, Westminster Hospital (All Saints Urological Centre) Bristol John Wright 1950 Pp 268 25*s*

THE thesis of these authors is that "all abdominal disorders originate from liver damage"—that is, from portal hypertension and the impairment of the detoxicatory function of the liver We are asked to believe that such diverse conditions as "ulcers of the intestinal tract in stomach, duodenum, jejunum, appendix or gall-bladder are caused by one disorder only—i e, acute or chronic intoxication of the liver" In case one should feel that the hypothesis is too narrow the authors inform us that "the portal blood may even enter the thyroid plexus through anastomoses with the œsophageal vein, and possibly result in a toxic goitre" A considerable amount of somewhat startling factual information is presented in support of these views, but little real experimental evidence The book can be warmly recommended to those who enjoy finding the weak points in a novel argument

Diseases of the Foot

EMIL D W HAUSER, M S, M D, associate professor of bone and joint surgery, Northwestern University, Chicago Philadelphia and London W B Saunders 1950 Pp 415 35*s*

THERE are now a number of orthopædic textbooks dealing with diseases of the foot, notably those of Lake in this country and Lewin in America Dr Hauser makes a valuable addition to these, for though his volume adds little that is new it is thorough and systematic, and written with a personal flavour as well as with authority Some of the author's preferences in treatment are widely shared (e g, strapping in the treatment of club-foot), others are more controversial, for instance his view that there is some relation between mycosis of the feet and thromboangiitis obliterans It is pleasant to find operative treatment firmly kept in second place The clinical photographs and the reproductions of X-ray films are very good

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Über die Petrositis (Vienna Maudrich 1950 Pp 99 D M 9)—This is a small monograph in which Prof Otto Mayer describes a group of cases and discusses them from a clinical and surgical point of view The approach is that of the otological surgeon, but the subject is one that interests the neurological physician and surgeon as well The work is largely descriptive

Amœbiasis (2nd ed Cairo Fuad I University Press 1949 Pp 44)—Dr G P B Sobhy deals chiefly with intestinal amœbiasis, though he mentions the important metastatic lesions, such as amœbic infection of the liver He discusses at some length the clinical manifestations, diagnosis, and treatment, and deals more slightly with the propagation, prophylaxis, and pathology of the disease Sobhy Bey has had great experience and his views are entitled to respect, nevertheless, in the absence of the data on which they are based some of his statements are open to question For example, in discussing pathology he attributes inflammation and leucocytic infiltration to "eruption of the parasites in the submucous coat whereas other writers suggest that until secondary infection occurs, there is a notable absence of leucocytic infiltration in intestinal amœbic lesions Again, his account of the life-cycle of the parasites in relation to the action of drugs upon them seems somewhat confused He suggests, for instance, that in chronic cases cysts can be made to hatch by giving extract of ox bile by mouth, so producing diarrhœa, and that the amœbæ can then be attacked with emetine This view seems to overlook the fact that amœbic cysts arise in the intestine from pre existing vegetative amœbæ, and that amœbæ appearing with diarrhœa in a patient previously passing cysts are, in fact, amœbæ which have not been able to encyst before being swept from the bowel

Atlas der Blutkrankheiten (4th ed Berlin Urban & Schwarzenburg 1949 Pp 256 D M 60)—The last edition of this book, by Dr Karl Schleip and Prof Albert Alder, was published in 1941 and is not well known in this country This edition consists mainly of 139 colour plates, all from paintings and admirably clear—sometimes perhaps deceptively clear The various kinds of cells have a plate each, and the various diseases are represented by whole fields, it is clearly stated whether they are original fields or arranged ones to show the various cell types The book is divided into two parts, a first section on blood and a second shorter section on bone marrow This artificial division unusual in modern textbooks, is possibly a relic from older editions The work is comprehensive, and we remain doubtful whether much is gained by including, for example, pictures of the blood in neutrophil leucocytosis, or in pernicious anæmia in remission, or of large red cells in liver cirrhosis But there are some very fine unusual plates as well, among which pride of place goes to that of peripheral blood from a 5-6 week embryo

This, then, is a standard textbook, well executed and reflecting the views of the Swiss school But those whose German is poor need not struggle with the text, since there are equally good, if not better, books in English

Essentials of Obstetrical and Gynæcological Pathology (2nd ed London Henry Kimpton 1949 Pp 350 60*s*)—This volume, by Dr R L Faulkner and Dr Marion Douglass, of the Western Reserve Medical School, will inevitably be compared with Novak's classical textbook Avowedly aimed at a lower level of the hierarchy of the specialty it gives no references and does not discuss academic points at any length, but it bears the imprint of Novak's school The short opening chapters on The Surgical Specimen and on Elementary Histology will help the house officer, and the comparative brevity of accounts of rarer conditions will give him a proper perspective If the type is a little hard on the eyes, the subject matter is refreshingly free from serious error or omission, and the illustrations are liberal though many of the photomicrographs lack sharpness of definition The approach is always clinical, and the book offers plenty of sound instruction to the postgraduate starting on the long climb to a higher degree in gynæcology In another edition he would probably be grateful for an additional section on the pathology of pregnancy in general, including the toxæmias

Doctors Courageous (New York Harper 1950 Pp 292 $3 50)—Dr Edward H Hume surveys the history of missionary effort by doctors in four directions —in Africa, in India and Pakistan, in the Near and Middle East, and in China The account, though not based on the first hand experience which helped to make his *Doctors East and Doctors West* so interesting, is nevertheless written by one who is master of the subject and who can hold the reader's attention in what has to be a highly condensed statement He makes clear how great is the reward that waits on medical work among the natives and how much has been accomplished by patient and steady persistence Even the Witch doctors are growing hospital minded and have acquired stethoscopes to impress their patients that they too have a part in the new order of things

The Common Diseases of the Skin (4th ed Edinburgh Oliver & Boyd 1949 Pp 274 21*s*)—Dr G A Grant Peterkin has ably concluded the revision of this textbook by the late Dr R Cranston Low It is of a convenient size and eminently practical even on the subject of starch poultices real working instructions are given There are plenty of good monochromes, which prove afresh that, for illustrating diseases of the skin, good black and white pictures can be better than colour photographs, which are often inaccurate and therefore misleading However, some faithful colour plates of the rightly famous Edinburgh moulages are included The condition which has long been classified as acute seborrhœic dermatitis is here taken out of the 'seborrhœa' group and is given the provisional name of "flexural infected eczema" Dermatitis would have been a better word, for the term 'eczema' is now becoming obsolete but it is to be hoped that others will follow this lead, and include under seborrhœa only seborrhœa capitis dry scaly seborrhœa corporis, and infantile seborrhœic dermatitis

THE LANCET

LONDON SATURDAY, DEC 30, 1950

Hepatitis

THE 1939 infective hepatitis (catarrhal jaundice) aroused comparatively little interest, but during the war the disruption of military plans by epidemics among troops led to investigations throughout the world Fortunately, this interest has persisted, and after many lean years some progress is being made

The maximum incidence is in the age group 5 to 15 years, but in these young people the disease is usually very mild, and jaundice is rare in children under 5 Infection at this age may be symptomless or may cause mild gastro enteritis, while attendant nurses develop the full blown disease Occasionally, however, even in the very young the disease may terminate fatally, either with acute yellow atrophy or after protracted subchronic hepatitis and resulting multiple nodular hyperplasia [1 2] One of the cases reported by TRAISMAN et al [2] was thought to be due to transfusion with an icterogenic batch of blood plasma So called homologous serum hepatitis apparently has a lower attack rate in children,[3] but undoubtedly the condition does occur When a group of susceptible children receive injections from an icterogenic pool, the fatality-rate may be high, among 41 cases in a group who received convalescent measles serum there were 8 deaths [4], and among 7 cases in a similar, more recent, episode there were 3 deaths [5] It was hoped that these rare incidents would be eliminated by the routine irradiation of serum with ultraviolet light [6] However, recent reports from the U.S A of hepatitis after administration of irradiated plasma [6] confirm warnings by MACCALLUM [7] and NEEFE [8] that this technical procedure needs care Moreover, the original experiments showing inactivation by ultraviolet light were carried out on only two or three strains of virus Observations by COCKBURN and his colleagues [5] on the results of inoculating the gamma globulin fraction of an icterogenic plasma pool confirm the belief that this fraction is relatively non icterogenic among 10 recipients of plasma there were 7 cases of jaundice with 3 deaths, but among 58 recipients of gamma globulin there was only 1 case, which was mild. Whether the fractionation procedure involved in making gamma-globulin inactivates the icterogenic agent, or merely masks it by concentrating antibody in excess of virus, is unknown. Since 1945 epidemics of infective hepatitis have been uncommon except in the U.S army of occupation in Germany, where the civilian population is little affected [9] The reason for this is still obscure, but there seems to be a suggestion that a considerable proportion of these cases are inoculation hepatitis of one kind or another A further limited source of hazard is infection from handling human sera either in the clinical laboratory or the blood-bank [10]

In 1945 STOKES and NEEFE [11] reported that gamma-globulin prepared from ordinary adult serum was, as in measles, a useful prophylactic against infective hepatitis in closed or semi closed communities This was later confirmed by HAVENS and PAUL [12] But, once the disease develops, the outcome depends mainly on the patient's own recuperative powers Most adult patients make a good recovery with no residual damage, but, as we have remarked, acute yellow atrophy occasionally develops in children, and in some adults the acute attack is followed by subchronic or chronic hepatitis and death Because 'Aureomycin' acts on some viruses, its effect on infective hepatitis was studied in the U S A. It was found to have little, if any, influence on the duration or severity of the acute symptoms,[13] but when given to patients with acute hepatic coma or chronic liver disease it seemed beneficial [14] Aureomycin has also prevented or delayed the onset of hepatic necrosis in rats on a necrogenic yeast diet This has led GYORGY and his associates [15] to suggest that aureomycin has no specific action on the virus but inactivates the intestinal organisms, thus preventing formation of bacterial metabolites and giving the parenchymal cells a chance to recover from their purely virus lesion

In the epidemiological field prospects also look brighter For many years it has been realised that for every patient with obvious catarrhal jaundice there were probably several with a less severe illness without jaundice Even in cases with jaundice there is no specific immunological test to distinguish infective hepatitis from obstructive or other types of jaundice Attempts to infect laboratory animals have been unsuccessful, and no satisfactory diagnostic changes could be observed in developing chick embryos inoculated with infective material However, ESSER and LEMBKE [16] reported from Germany that they had produced anicteric hepatitis in man by inoculation with egg cultures, and now HENLE and his colleagues [17] have obtained multiplication of two strains of infective-hepatitis virus—one from fæces and one from serum—in cultures of rabbit-liver and chick-embryo tissues and in the amniotic sac of developing chick embryos When both types of culture, representing a dilution of the original material of from 10^{-10} to 10^{-20}, were given orally in man, they caused an illness similar to anicteric hepatitis, usually after an incubation period of 20–35 days Furthermore, intradermal injection of the infected

ing dose of ultraviolet light, gave a positive skin reaction in nearly 100% of patients convalescent from naturally acquired or induced infective hepatitis [18], normal subjects so far tested have given only about 30% of positives A similar figure was obtained in cases of homologous serum hepatitis—a finding which supports the hypothesis that there are at least two immunologically distinct hepatitis viruses The thymol turbidity and flocculation tests may not distinguish between serum hepatitis and infective hepatitis in an individual case, but observations by GREEN [19] support the suggestion of MACLAGAN [20] and NEEFE [21] that these tests are less strongly positive in patients with serum jaundice than in those with infective hepatitis The growth of the virus of infective hepatitis in tissue-cultures is possibly a first step toward adaptation to small laboratory animals and production of large quantities of high titre material for specific serological tests

Although MACCALLUM and BAUER [22] reported jaundice in subjects inoculated with tissue culture of the virus of homologous serum hepatitis, skin tests with this material gave negative results in a small group convalescent from yellow fever vaccine (serum) jaundice Thus there is still no means of detecting donors who may be carrying hepatitis virus in their blood

Atherosclerosis and Cholesterol

MUCH of the recent work on atherosclerosis has been based on the assumption that the cause lies partly in the diet, and special efforts are being made to identify the particular dietary constituents concerned Cholesterol has been under suspicion ever since ANITSCHKOW showed that arterial lesions could be induced in rabbits by adding that substance to their food Cholesterol is a usual constituent of arterial lesions, and the hypercholesteræmia of diabetes mellitus, myxœdema, and the nephrotic syndrome is commonly associated with atherosclerosis Nevertheless it is not easy to believe that even transient hypercholesteræmia is an essential factor in a disease so common as to be discoverable (GEIRINGER [23] says)in everybody over the age of eight Perhaps too much attention has been paid to cholesterol, and too little to the other blood lipids In 97 men who developed severe coronary disease before the age of forty, GERTLER, GARN, and LERMAN [24] found that, though the blood lipid levels were above those of normal controls, the rise in serum cholesterol was not attended by a commensurate rise in phospholipids There was thus an increased cholesterol/phospholipid ratio, and the investigators took this to be a factor in atherosclerosis In support of this idea they cited experiments by LADD, KELLNER, and CORRELL,[25] in which the detergent 'Tween 80' (polyoxyalkylene sorbitan mono oleate) was administered intravenously to rabbits along with cholesterol Though the animals developed hypercholesteræmia, greater even than that produced by cholesterol alone, they did not develop atherosclerosis—a finding which LADD and his associates attributed to a concomitant rise in phospholipids induced by the detergent A similar effect was noted by STEINER [26] in giving choline along with cholesterol here again hypercholesteræmia was produced but little or no atherosclerosis, the choline having accelerated the synthesis of phospholipids in the liver There is in fact a growing body of opinion that the development of atherosclerosis is due more to an upset of the lipid balance than to an excess of any one lipid in the blood

Another suggestion relates to the physical state of the plasma lipids Most of these circulate as colloidal particles which are too small to be seen microscopically, but in the hyperlipæmias of metabolic origin, and in the alimentary lipæmia which follows a fatty meal, larger particles appear which can be seen with the dark ground microscope, and MORETON [27] has suggested that these macromolecular aggregates, or chylomicrons as they are called, are damaging agents He believes that they act upon the vessel walls in the same way as do the non lipid macromolecular substances, such as polyvinyl alcohol and methyl cellulose, with which HUEPER [28] induced arterial lesions in rabbits, so in MORETON's view atherosclerosis is the result of 'a lifetime's ingestion of many fatty meals In supporting this, BECKER, MEYER, and NECHELES [29] have shown that the chylomicrons tend to persist unduly in the blood of old people in young subjects the chylomicron count rises quickly after a fatty meal and returns to normal within $5^1/_2$ hours, but in older subjects it may remain high for 24 hours, and BECKER and his co workers think that this sustained alimentary chylomicronæmia is a factor in atherosclerosis Further support for this hypothesis has lately been obtained by POLLAK,[30] who injected colloidal cholesterol of varying dispersions into the circulation of rabbits and found that coarse suspensions induced arterial lesions more readily than fine ones It appeared that the large micelles were immediately precipitated on the surface of the arteries and phagocytosed by endothelial cells, so that within thirty seconds of the injections accumulations of them were established in the intima POLLAK holds that macromicelles of β globulin cholesterol and of α globulin cholesterol are the most likely damaging agents, and he argues that their excess in the circulation of older people may be due to a decrease in serum albumin From this it might be inferred that atherosclerosis results from an upset of the serum protein equilibrium due to inadequate liver function

The chylomicron hypothesis is not supported, on the other hand, by an investigation of the blood lipid by the use of the differential ultracentrifuge With this apparatus, which is capable of exerting forces millions of times that of gravity, molecules in solution are made to undergo sedimentation or flotation according to their densities, and their rates of migration can be recorded in Svedberg units GOFMAN et al [31] have applied this technique to the study of the serum lipids, and in recording their relative flotation (Sf) rates found that they fell into the following

18 Henle C Drake M F Henle W Stokes J *Proc Soc exp Biol* N Y 1950 73 603
19 Green P *Canad med Ass J* 1950 63 365
20 Maclagan N R *Brit med J* 1944 ii 363
21 Neefe J R *Med Clin N Amer* 1946 30 1407
22 MacCallum F O Bauer D J *Lancet* 1944 i 522
23 Geiringer E *Rev méd Liège* 1950 5 614
24 Gertler M M Garn S M Lerman J *Circulation* 1950 2 205
25 Ladd A T Kellner A Correll J W *Fed Proc* 1949 8 360
26 Steiner A *Arch Path* 1948 45 327
27 Moreton J R *Science* 1948 107 371
28 Hueper W C *Arch Path* 1945 39 117
29 Becker G H Meyer J Necheles H *Science* 1949 110 [illegible]
30 Pollak O J *Rev méd Liège* 1950 5 619
31 Gofman J W Jones H B Lindgren F T Lyon T P Helloff H A Strisower B *Circulation* 1950 2 161

classes (*a*) those with Sf rates greater than 75, which include the chylomicrons and the fatty molecules of alimentary lipæmia, (*b*) those with Sf values 30–70, which constitute the major fraction of alimentary lipæmia, (*c*) those with values Sf 10–20, whose molecular weight is in the neighbourhood of 3,000,000, and which contain about 30% of cholesterol (it is this group which appears to be specifically related to atherosclerosis), and finally (*d*) those with values Sf 3–8, which are the molecules containing cholesterol, phospholipid, and protein—loosely referred to as the B_1 lipoproteins A clue to the relation of these different classes of molecules to atherosclerosis is obtained from a study of the blood lipids in rabbits receiving cholesterol In the rabbit there are molecules of an Sf 10–30 class which usually, but not always, increase after long-continued cholesterol feeding GOFMAN and his colleagues observed that it was only in cases where these were increased that severe atherosclerosis developed, and they therefore concluded that these molecules were the damaging agents Proceeding then on the assumption that the Sf 10–20 molecules in man were homologous to the Sf 10-30 in the rabbit, they examined the concentrations of the former in various human diseases in which atherosclerosis is prevalent, including coronary insufficiency, diabetes mellitus, the nephrotic syndrome, hypothyroidism, and hypertension, and in all of these found significant increases They concluded therefore that the Sf 10–20 molecules—which, be it noted, do not include those of alimentary lipæmia—were the particular ones concerned in the development of atherosclerosis They noted, however, that the Sf 10-20 concentration in man could be reduced by restricting the intake of fatty foods

From this tangle of information it might be concluded that diet is the all important factor in atherosclerosis, but there are also facts that call for a modification of this view Atherosclerosis occurs spontaneously in chickens, and HORLICK, KATZ, and STAMLER[32] found that it still occurred when most of the fats and cholesterol were removed from the bird's diet Apparently therefore the endogenous lipids in the chicken suffice to provide for the atherosclerotic process, and probably the same holds for man, which brings us to where we were at the beginning of this review But it should be noted that HORLICK and his associates found that in the chickens on the low fat diet the lesions were on the whole less severe, so though exogenous fat may not be a necessary factor in the development of atherosclerosis, it is probably a contributory one Indeed, by feeding chicks on a high cholesterol diet STAMLER and KATZ[33] induced hypercholesteræmia, hepatic lipidosis, and a high incidence of atherosclerosis of the aorta

On all these counts therefore, it might be inferred that the severity of atherosclerosis could be reduced by dietary treatment, or by the administration of lipotropic drugs, and such measures have been widely tried Though in chicks choline and inositol did not prevent spontaneous atherosclerosis or atherosclerosis induced by cholesterol feeding or stilbœstrol,[34] MORRISON and GONZALES[35] have reported benefit from the administration of choline to patients with coronary disease On the other hand GERTLER, GARN, and WHITE,[36] noting that both in their coronary disease cases and their controls the serum cholesterol levels were "startlingly" independent of the amounts of cholesterol ingested, conclude that "there is no advantage to be gained from imposing a low cholesterol diet on patients with coronary-artery disease" Moreover any hopes of decisively changing the outlook for such people can be based only on the assumption that it is the fatty changes themselves that are directly responsible for the fatal consequences in atherosclerosis, and this is doubtful In coronary atherosclerosis it is not the fatty change which hardens and constricts the vessels, but the fibrous thickenings, and the nature of these thickenings is still in doubt They have long been regarded as reactive overgrowths of the intima, excited by the presence of fats, but in resurrecting the thrombosis hypothesis of ROKITANSKY, DUGUID[37] has suggested that in reality they are organised mural thrombi If this is true, the fatty changes can play only a limited part in the process They may promote the thrombosis, and to eliminate them might reduce the thrombotic tendency, but once thrombosis has begun, the size of the thrombus and the extent to which it interferes with the circulation must depend on factors which govern fibrin formation—and this is a field still incompletely explored Even if the thrombosis hypothesis is wrong, however, it has still to be remembered that it is not so much the fatty deposits as the fibrous thickenings that interfere with the circulation, and these two changes are not so constant in their relationship as to indicate that they are necessarily interdependent One sometimes sees coronary thickenings, amounting almost to total occlusion, with little or no fat in them, and it is hard to see how the ingestion of fats could be more than remotely culpable

32 Horlick, L Katz L N, Stamler J *Amer Heart J* 1949 37 689
33 Stamler J Katz L N *Circulation*, 1950 2 705
34 Stamler J, Bolene, C Harris R, Katz L N *Ibid* pp 714, 722
35 Morrison L M. Gonzales W F *Proc Soc exp Biol N Y* 1950 73 37
36 Gertler M.M. Garn S M. White D D *Circulation* 1950 2 696
37 Duguid J B *Lancet* 1949 ii 925

Apologia of an Allergist

Dr JOHN FREEMAN, with his friend the late LEONARD NOON, took part in the earliest experimental investigations of hay fever, in 1908, and the way was thus opened to him for those studies of "toxic idiopathies" which have occupied the whole of his working career and are now collected in an imposing but most human and attractive record[38] At that time little of value had been published on hay-fever directly, since BLACKLEY's monograph in 1873, which had recognised the condition as due to individual sensitiveness to grass pollen in the air States of specific sensitiveness, resulting from infections or artificial injections, had indeed been described in the interim, and presented analogies whose significance FREEMAN may be rather too ready to discount RICHET had described in 1902, and named "anaphylaxis," a condition of acquired specific sensitiveness in dogs, following an earlier injection, and THEOBALD SMITH had initiated a much wider study of this phenomenon by his recognition of it in guinea pigs in 1904 In 1904 also, von PIRQUET, studying such conditions as "serum sickness" and the accelerated but abortive reaction of the immune subject

38 Hay Fever A Key to the Allergic Disorders By JOHN FREEMAN D M London Heinemann Medical Books 1950 Pp 321 42s

to vaccination, had coined the word "allergy" to describe all conditions of "altered reactions consequent on an infection, or on treatment by some foreign substance", he obviously, therefore, intended the term to cover immunity in all its manifestations, as well as, or paradoxically including, those in which the response indicated an acquired sensitiveness To FREEMAN and NOON, however, hay-fever seemed in 1908 to present the opportunity of exploring a phenomenon which had hardly, if at all, been touched by experiment, and the enterprise was made additionally attractive by the prospect of finding means of relief, or better of prophylactic treatment, for an often disabling affliction

From that beginning FREEMAN, after NOON's early death, found himself following the clues of obvious analogy, which led him to a wider study of specific sensitiveness to the now familiar range of provocative substances (food constituents, epidermal dusts, moulds, drugs, &c) and of the varieties of reaction produced by contacts with them, according to the organ or tissue affected—urticaria, rhinorrhœa, asthma, and the rest And following, as he gratefully acknowledges, the example of his teacher SIR ALMROTH WRIGHT, that connoisseur of neologisms, FREEMAN proposed to name these conditions "toxic idiopathies", the provocative substances were to be "idiotoxins" and the substance in the serum, capable of transmitting the idiopathy to the skin or mucous membrane of a normal subject, an "idioceptor" A purified extract used for diagnosis of an idiopathy was a "pathophane" The nomenclature thus proposed was rational enough, and sufficiently free from theoretical implications, but it did not achieve the general currency which it deserved "Toxic idiopathy" was, after all, rather a mouthful, and von PIRQUET's "allergy" was available to replace it, though only by a drastic restriction of its original meaning, the derivatives "allergic," "allergen," and "allergical antibody" were ready to hand to complete the range of synonyms And though "allergy" and "allergic" have suffered a popular debasement in the allusive slang of the music hall and the cocktail party, they have obtained such a hold in medical usage also that FREEMAN feels bound to employ them, as on the title page, though not regularly and consistently

Dr FREEMAN's book is a very personal document, and it has a very practical character Every chapter contains records of experiments made by the author, and abundant gleanings from the rich harvest of a lifetime's clinical experience in this special field The conditions studied being, in the manner of their occurrence and manifestation, peculiar to the human species, there is of necessity a specially intimate relation between experiment and clinical observation in dealing with them Hay fever itself, the first of such conditions to be studied in detail, and a central point of interest for the author ever since, stands as the type for the whole group Though the "allergic," or "idiopathic," factor is emphasised, there are full and enlightening chapters on the influence of trauma in localising the reactions, and on emotions, moods, and tensions in precipitating attacks, or even in rendering manifest and active a condition which was presumably already present in a dormant form It must be admitted that no satisfactory explanation of such a connection is offered by FREEMAN—or, for that matter, by any body else He strongly contests a tendency to explain such conditions as simply neurotic in origin, but the nature of the link between the admitted neurotic factor and the biochemical phenomenon of the allergic sensitiveness seems to be left in obscurity one would like to have some more evidence about allergic reactions on denervated or decentralised areas Perhaps, too, he might have given less emphasis to the points of contrast, and have found more of interest in the points of similarity, between the fundamental mechanism of anaphylaxis, as produced experimentally in certain animal species and the idiopathies which occur, apparently spontaneously, in man For example, the reasons which lead him to argue that the "idioceptor" is not an antibody of any known kind are just those which led the earlier workers on anaphylaxis in the guinea pig to conclude that its "anaphylactic antibody" was something quite special, yet probably nobody now seriously doubts that it is after all a precipitin, predominantly fixed to the sensitive cells Similarly, FREEMAN describes the serum of the prophylactically treated patient as having "a newly acquired characteristic," somehow masking the sensitising capacity of the blood (idioceptor), which is nevertheless still there The relation between immunity and anaphylaxis, as now generally accepted, might, by analogy, afford a simpler interpretation And how does he reconcile the suggestion of a completely spontaneous origin of sensitiveness to egg protein, for example, with the almost complete absence of ambrosia fever in this country and its prevalence in the U S A, where ambrosia is so common a weed?

In general, Dr FREEMAN's book provides a feast of information, compounded of observations, experiments, and wise and cautious commentary Essentially it is the scientific autobiography, though not a chronologically consecutive one, of a genuine pioneer, and it has the individual quality that enables an author's friends to fancy that they hear his voice as they read

Public-health Salaries

NEW minimum salary scales for doctors in the public health service were awarded last week by the Industrial Court The scale for medical officers of health is as follows

Population up to	Salary (£) Initial	Annual increment
75 000	1450–1650	50 × 4
100 000	1550–1850	50 × 5
150 000	1750–2050	50 × 5
250 000	1950–2250	100 × 2, 50 × 1
400 000	2000–2500	100 × 2, 50 × 1
600 000	2300–2700	100 × 3

Where the population exceeds 600 000 the minimum scale will be followed with annual increments at discretion

Senior medical officers are to receive a minimum of £1250, rising by annual increments of £50 to £1650, and assistant medical officers or medical officers in departments £850, rising by annual increments of £50 to £1150 Scales for deputy medical officers, divisional or area medical officers, and officers holding mixed appointments are to be determined by joint negotiation and agreement between the parties The new scale are to operate from Oct 1 last and they will at least improve the position of most of the more senior members of the public health service Unfortunately they do nothing to attract able men into the junior ranks, and little to give the service the prestige it needs

Annotations

ALARMING NAMES FOR HOSPITALS

SOME words have such strong associations that they cannot be used neutrally For many people the word "cancer" is identified with painful death, and the fact that this hopeless attitude is wrong does not mean that it can be ignored As doctors we know that cancer is a disease like other diseases, and that many of its early forms are both painless and curable we know these things because we have been taught pathology, have seen results of treatment, and have examined statistics but lay people have not had these advantages they only know that we can offer no certain cure for every case of malignant disease, and some of them have had to watch a painful death much more closely and painfully than most doctors "Incurable" is another dreaded word, suggesting lingering misery

It is more than unfortunate, as has been pointed out from time to time,[1] that such words have found their way into the names of hospitals Hospitals for "incurables," for "consumption," for "the dying" and above all for "cancer," give patients and their relatives a great deal of unnecessary pain and anxiety One of our correspondents cited the case of a woman whose first intimation that her husband had malignant disease came through a telegram "Bed available at the Cancer Hospital." This kind of shock can be extremely disturbing Even those who know they are tuberculous, or dying, or that their disease is incurable, must feel some added load at the heart when they enter hospitals with such dooming names, for their friends the name underlines the tragedy To talk of consideration for the patient and the value of the psychological approach, and so on, and yet to inflict such useless pangs, implies a failure to think straight—or else to take enough thought. No doubt there are difficulties financial or other, in the way of changing hospital names, but if so these should be examined patiently and minutely, and overcome It may well be inconvenient to make changes it cannot be impossible Doctors at any rate will be unwilling to put convenience before the ease of mind of patients, and it lies in the hands of the medical staffs of these hospitals to convince their less informed, or less sensitive, lay colleagues that for good or evil much lies in a name

HYPOGLYCÆMIA

In their milder degrees the symptoms of hypoglycæmia are too vague and varied to be picked out from among the many similar symptoms which form the stock in trade of outpatient departments The first disturbancements are in higher cerebral function and in mood the ability to reason competently is lost and the subject may be unusually morose or garrulous, though he is often able to continue a routine task, such as driving a car If the hypoglycæmia is a little more severe there are associated symptoms and signs of adrenaline release—particularly pallor, sweating, dilatation of the pupils, tremor, and feelings of fear, coldness, and hunger If the attack progresses there may be a phase of neuromuscular overactivity before the onset of disorientation and, eventually, coma—which is sometimes associated with convulsions The dominance of neurological disturbances reflects the unique position of glucose as food to the nervous system the effects of glucose deficiency are practically identical with those of anoxia or disturbed thyroid function, for with each of these metabolism is curtailed

Hypoglycæmia may be due to deficient glucose absorption (for example, in myxœdema and long continued starvation), to excessive urinary loss, as in severe renal glycosuria, or to deficient glycogenolysis, which may occur in advanced cirrhosis and in von Gierke's disease Lastly, there may be relative or absolute insulin excess Relative excess is a feature of Simmonds's cachexia and Addison's disease, whereas true excess may be produced by islet cell adenoma or carcinoma of the pancreas, or simply by functional overactivity of a histologically normal pancreas To functional overactivity has been ascribed the postgastrectomy hypoglycæmic syndrome, otherwise such overactivity is found mainly in nervous patients, whose vague hypoglycæmic symptoms may easily be dismissed as not due to any organic cause In practice the differential diagnosis of causes of hypoglycæmia is usually difficult only when considering islet cell adenomas and functional hyperinsulinism Typically the patient with an islet cell adenoma has progressive symptoms, whereas with functional hyperinsulinism the symptoms are more capricious Functional hypoglycæmia usually comes on some 4 hours after a carbohydrate meal, which presumably provokes excessive insulin secretion, the hypoglycæmia of an islet cell tumour, on the other hand, is more marked as the interval since eating increases Functional hypoglycæmia responds to frequent feeding on a high protein diet,[1] whereas with islet cell adenoma this treatment is not long effective[2] If the fasting blood sugar is persistently 50 mg per 100 ml or less, the cause is more likely to be tumour than functional, and it is worth noting that the fasting level gives more reliable information than the glucose tolerance test[3]

With regard to treatment, much depends on accurate diagnosis, for surgery can offer much only in cases of adenoma Whipple[4] will operate only where the following three criteria are fulfilled (1) attacks come on in the fasting state, (2) during an attack, or after a long fast, the blood sugar is below 50 mg, and (3) the attack responds readily to glucose With this strict choice he found a tumour in 80% of the patients operated on Whipple (whose surgical mortality was 12%) recommends that the duodenum be mobilised so that the head of the pancreas can be adequately palpated between fingers and thumb In these cases the hyperglycæmic action of ether as anæsthetic may be desirable When the criteria of organic hyperinsulinism are present and yet no adenoma can be found, subtotal pancreatectomy can be expected to produce a cure in 40% of cases and improvement in a further 10%[5], not uncommonly the resected pancreatic tissue contains an adenoma which was previously overlooked After operation temporary diabetes is common, indeed it is a hallmark of success The pathological classification of islet cell tumours correlates poorly with the clinical classification, for many such tumours are non functional and others which appear to be invading blood vessels are in fact benign[5] The rare true carcinoma of islet tissue may cause rapidly progressive hypoglycæmia and is unique in that the more it metastasises the more the patient may gain in weight, since he increases his food intake to compensate for the excess insulin Here surgery is almost always unavailing, as a last resort alloxan may be tried, though it has never been shown to produce more than temporary remission[6] and neoplastic β cells appear to resist its action more than normal β cells[7] For functional hyperinsulism which responds insufficiently to diet,

1 *Lancet* 1948 II 628 707

1 Thorn G W Quinby J T Clinton M J *Ann. intern Med* 1943 18 913
2 Perkins H A Desforges J F Guttas C G *New Engl J Med* 1950 243 281
3 Whipple A O *Amer J Med* 1946 1 424
4 Whipple A O *Surgery* 1944 16 289
5 Howard J M Moss N H Rhoads J E *Int Abstr Surg* 1950 90 417
6 Brunschwig A Allen J G Owens F M Thornton T F *J Amer med Ass* 1944 124 212
7 Conn J W Hinerman D L *Amer J Path* 1948 24, 429

adrenocorticotropic hormone (A C T H) has been employed for its diabetogenic action , sometimes the improvement has outlasted by some time the period of administration [8]

ANTIBIOTICS IN OPHTHALMOLOGY

THE newer antibiotics were discussed by the Royal Society of Medicine's section of ophthalmology on Dec 14 Outlining the place of antibiotics in the treatment of systemic affections, Dr T B Maxwell remarked on the relative specificity of penicillin, streptomycin, 'Aureomycin,' chloramphenicol, and 'Terramycin', and he brought out the advantages sometimes of administering more than one antibiotic

That the results obtained in systemic affections cannot readily be applied to the eye was emphasised by Prof Arnold Sorsby He pointed out that ophthalmologists readily adopt the concept of the eye as functionally a double organ with a dioptric apparatus and a receiving mechanism But pharmacologically, too, the eye is a double organ the lids, conjunctiva, adnexa, and sclerotic may be grouped with the other systems to which the general rules for administration of antibiotics apply , but in the avascular part of the eye—the cornea and the aqueous and vitreous humour—a lower concentration results from systemic administration of antibiotics The blood aqueous barrier is responsible for low concentrations in the aqueous and vitreous, and indirectly in the cornea In using the newer antibiotics the lessons from the use of penicillin have to be borne in mind Against eye infections systemic administration of penicillin is not particularly effective Local application seems to offer some promise , but drops are readily washed out, and ointments are only a little better The most effective method of application is undoubtedly subconjunctival injection, which causes a depot of the agent to persist around the eye for some hours If adrenaline or other vasoconstrictor is added to the subconjunctival injection the intra ocular level is both higher and more persistent With a dose of 1 million units of penicillin subconjunctivally, the concentration in the vitreous is almost as high as that achieved by the introduction of 5000 units directly into the vitreous These results also apply to streptomycin, and probably also to aureomycin and chloramphenicol, though the behaviour of these last two drugs is very different from that of penicillin and streptomycin For the present it seems that with these agents subconjunctival injection is still the method of choice , unlike penicillin and streptomycin, however, aureomycin, chloramphenicol, and terramycin are relatively insoluble, and existing preparations are fairly irritating Professor Sorsby and Dr N B Bailey have found that in the proteolytic type of corneal ulcer due to gram negative bacilli good results are obtained by subconjunctival injection of streptomycin (0 5 g in 1 ml of solvent containing 10 minims of water and 5 minims of adrenaline) , and this is a valuable addition to the control of corneal infections Streptomycin systemically, said Professor Sorsby, has a definite place in the treatment of tuberculous keratitis and phlyctenular ophthalmia , in phlyctenular ophthalmia it both cuts short an acute attack and reduces the risk of recurrence Sorsby and Bailey have found streptomycin of little use in iridocyclitis and in Eales's disease

The effect of aureomycin on trachoma, superficial punctate keratitis, dendritic ulcer, and disciform keratitis was discussed by Mr Derek Amslie Systemic administration has not proved particularly valuable Trachoma has responded to aureomycin locally, while two cases of disciform keratitis did well on subconjunctival injection of 5 mg Dr Ruby Joseph likewise reported a good response, in a case of disciform keratitis, from two injections of 10 mg of aureomycin Nevertheless, the irritative reactions are an almost definite contra indication except with pure aureomycin, which she was able to use in her most recent case of epidemic keratoconjunctivitis

8 McQuarrie I Bauer E G Ziegler M R Wright W S *Proc Soc exp Biol N Y* 1949 71 555

A STUDENT TUBERCULOSIS CENTRE

STUDENTS are more liable to contract tuberculosis than other young people It has been estimated that 0 2% of those in universities, technical colleges, and training colleges, and 0 9% of those studying medicine, are obliged to interrupt their studies for a term or more because of the disease , and this leaves out of account those who are able to carry on despite a tuberculous infection

On another page Prof F R G Heaf, Mr C R Morris, and Sir Alan Rook announce the launching of the British Student Tuberculosis Fund A committee to administer the fund has been set up, on which are represented student and teacher organisations, and bodies interested in the health of students and in tuberculosis The aims are clear cut to give help of every kind to British or other students with tuberculosis, and to set up a tuberculosis centre where students, after a period of sanatorium treatment, may complete their recovery and also carry on with their studies Centres of this kind have been maintained for some time in France, and the committee have already made a study of them The incidence of tuberculosis among French students (numbering some 130,000) is 1 4% The service helps them all, and throughout treatment they are encouraged —subject to the recommendations of their physician— to go on with their studies They stay, on average, 10 months in a sanatorium and 10 months in the reablement (or "post cure") centre, and 60% of them are able to sit for their examinations

The committee define the word "student" as 'a senior or student member of a university or other institute of higher education"—a definition which (whether intentionally or not) seems to open the gates, not only to undergraduates, students, and teachers, but to most postgraduates, regardless of whether they still have any connection with their universities The numbers thought to be affected, however, amount only to 250 , and it is proposed that the centre should begin with 100 beds The cost of buying, converting, and equipping such a centre is put at £50,000, and since this is an enterprise on behalf of students, and largely initiated by students, the proposals for raising the money are pleasantly vigorous and racy The national appeal committee have set for every university, college, medical school and teaching hospital in the country a target of 2s 6d per student—not necessarily to be raised by donations (though many may wish to give this amount or more) but rather by such things as athletic events rag days concerts, plays, dances, socials, carol singing, jumble sales, stamp sales, or in any other ways that ingenuity suggests Every interested centre of education is being asked to set up a strong appeals committee, who will open their campaign by writing to every university or college society (even chess clubs will be swept into the arena) to know what activity each can arrange to raise funds for the appeal Illustrated articles will appear in student journals , the local press will be asked to help teachers will be invited to make announcements at the beginning or end of lectures posters will be available college clubs will levy, on behalf of the fund, "entertainment tax" at their functions and the national appeal committee in London, will sponsor lecturers to be invited down, provide slides to appear in cinemas and give any other help it can to the local committees University College, London, is leading the way with a plan designed to bring in several thousand pounds

Special Articles

DERMATOLOGICAL ASPECTS OF UNEMPLOYMENT AND RESETTLEMENT

MARK HEWITT
M.B Lond , M.R C.P
LATELY MEDICAL ADVISER, MINISTRY OF LABOUR AND NATIONAL SERVICE, NORTH WEST REGION , CLINICAL ASSISTANT, MANCHESTER AND SALFORD HOSPITAL FOR DISEASES OF THE SKIN

OCCUPATIONAL resettlement after prolonged incapacity through skin disease has received little attention Experience of such resettlement has been confined to the services (Bolam 1945), where patients were under military discipline Restoration of function for return to duty was the prime concern, and the willing and fit man was easily fitted into a suitable job at the end of his course, while the unwilling, or completely unfit, were released into the civilian community All these circumstances contrast strongly with those encountered in civilian practice

The Disabled Persons (Employment) Act, 1944, was intended to help disabled people whose physical or mental handicaps were substantial and who might have to change their employment From my experience of the work in employment exchanges in the north west of England I have tried to assess what the Act has done for people disabled by skin diseases I shall also comment on the extent of the problem, on the resettlement results in a group of these patients, and finally on the contributory causes of unemployment in a separate group of 50 registered disabled unemployed persons suffering from skin disease.

Under the Act the disablement resettlement officer (D R.O) maintains a register of employed and unemployed disabled persons, and his main concern is to resettle the unemployed satisfactorily in suitable occupations Besides facilities for placing them in jobs, he also has at his disposal valuable training schemes for skilled work. For the more severely disabled, there are sheltered employment and ancillary home working schemes Industrial rehabilitation in the early stages of recovery is provided at 13 centres recently established throughout the country (Ministry of Labour and National Service 1948), where, by means of expert vocational guidance, the disabled are helped to adapt themselves to work most suited to their disability and remaining abilities.

THE DERMATOLOGICALLY DISABLED

Dermatological cases present industrial medical officers with a major medical problem and personnel managers with a difficult management and resettlement problem (Hadley Smith 1947, Crosthwaite 1946, Schwartz et al 1947) There seem to be no accurate figures for morbidity due to skin disease in the civilian population, but in the Army skin diseases are one of the main causes of admission to medical units, ranging from around 15% of total admissions in temperate climates to something approaching 20% in tropical and subtropical zones (Army Medical Statistical Department personal communication)

Paradoxically, of 935,007 registered disabled persons (R.D P) over the whole country, only 9512, or about 1%, were registered with skin disabilities, and of these 689 were unemployed (October, 1949) Possible explanations of these low figures are a natural disinclination on the part of these patients to register their disabilities, a well known reluctance on the part of works managers to employ them if the diagnosis is known, a tendency for pre employment medical examination to prevent their obtaining employment, and a lack of appreciation on the part of their medical advisers of the value of early and satisfactory resettlement as a form of therapy Alternatively, the figures may portray a satisfactory situation and suggest that no real problem exists

Table I gives five selected types of disability, showing the total registered disabled persons—the number unemployed and the latter expressed as a percentage of the former—with the purpose of providing some impression of their relative success in obtaining and retaining employment The unemployed are classified in two ways

1 Those capable of ordinary employment, as opposed to those likely only to obtain sheltered employment
2 Those unemployed under and over 26 weeks

Similar figures for all disabled are included.

Only 2 6% of those registered with amputations of one arm and one leg are unemployed—a figure which reflects the relative ease of resettling the obviously disabled man Internal diseases—such as bronchitis and heart disease, which respectively account for 10 9% and 9 4% of the registered disabled unemployed—present a problem second only to that of pneumoconiosis, which in South Wales is responsible for unemployment in nearly a third of those registered as disabled by the disease In contrast only 5 8% of those registered with pulmonary tuberculosis are unemployed. The percentage of unemployment among those registered as disabled by diseases of the skin and dermatitis (7 2) is about the same as the percentage of unemployment among all registered disabled persons (7)

TABLE II

Regions	Registered disabled persons			Unemployed registered disabled persons		
	Total	With skin disabilities	% of total	Total	With skin disabilities	% of total
London and S E	217 690	2506	1 17	11 108	144	1 3
Eastern	43 634	486	1 11	2021	31	1 55
Southern	38 426	410	1-06	2179	33	1 52
South Western	45 142	488	1-08	2962	29	1-04
Midland	82 295	825	1-0	2713	49	1 8
North Midland	64 614	729	1 15	2091	29	1 4
E and W Ridings	83 588	813	1 02	4559	30	-66
North Western	142 160	1422	1-0	9518	115	1 2
Northern	65 233	516	1 26	7790	58	75
Scotland	85 756	615	0 72	8405	53	-63
Wales	66 199	702	1 08	12 021	118	1-0
Gt Britain	935 007	9512	1 02	65 367	689	1-05

TABLE I—SELECTED GROUPS OF DISABLED PERSONS, OCTOBER, 1949

Disablements	Total registered disabled persons	Unemployed				Duration of unemployment	
		No of disabled persons	% of total registered	Capable of ordinary employment	Requiring sheltered employment	26 weeks and under	Over 26 weeks
Amputation one arm and one leg	14 599	375	2-6	337	38	204	171
Bronchitis	58 448	6376	10 9	5572	804	2910	3466
Disease of heart	54 024	5329	9 4	4516	1023	2738	2591
Silicosis coalminers	14 863	4760	32 1	4271	489	1054	3706
Diseases of the skin, dermatitis	9512	689	7 2	647	42	428	261
Tuberculosis (respiratory)	47 132	2737	5 8	2260	477	1651	1086
Total all disabled	935 007	65,367	7	55 049	10,318	32 694	32 673

TABLE III—INSURED POPULATION AND NUMBER OF PERSONS WITH REGISTERED SKIN DISABILITIES FOR SELECTED TOWNS AND WHOLE COUNTRY

Selected employment exchanges	Insured population	No of R D P s on register with skin disabilities	% of insured population
St. Helens	51 000	68	0 133
Northwich	18 508	42	22
Horden	13 171	11	09
Wigan	44 880	55	122
Walkden	13 920	16	114
Glasgow	560 581	149	026
Leeds	267 400	103	039
Sheffield	242 390	82	034
Cardiff	133 720	42	032
Birmingham	609 895	210	034
Manchester	501 640	145	029
Willesden	89 550	28	031
Gt Britain	20 500 000	9512	046

The age group distribution of skin disabled unemployed also resembles that of the whole unemployed disabled population, showing the same correlation between age and unemployment Of the 261 persons with skin disease who were unemployed for more than twenty six weeks 209 were over 41

DISTRIBUTION OF CASES

Table II shows the division, according to region, of registered disabled persons and those registered with skin disabilities Apart from the relatively low percentage for Scotland, the skin cases appear to be evenly distributed through the country Table II also shows the total unemployed disabled persons and those unemployed with skin disabilities Resettlement seems to be most satisfactory in Scotland and the East and West Ridings of Yorkshire, and least satisfactory in the Midland region

The figures for the cities shown in table III are well under the national average Of these, Leeds has a slightly higher percentage than any of the others These low figures are counteracted by a high incidence in towns where industry is purely chemical—e g , Northwich

Coalmining appears to account for the higher incidence in Wigan and St Helens, though the high figure in the latter is probably partly attributable to the glass processing and ancillary industries The incidence in pure coalmining areas such as Walkden, Lancashire, and Horden, co Durham, is twice as great as the national average

A SAMPLE FOLLOW UP

A series of 100 consecutive persons with skin disabilities who applied to become registered disabled persons at exchanges in the North West were medically examined and their progress in resettlement was followed for a year (table IV)

Resettlement was regarded as successful if the man was working at the job six months after he had been placed in it The placing performance of the D R.O. was encouraging, but many of the cases were unemployed for some time before finding work The success of rehabilitation and resettlement schemes will vary locally and nationally with the labour demand. Analysis of the results of the 100 cases by diagnostic groups was not significant It was, therefore, felt that a detailed review of a group of unemployed skin cases might be useful

ASSESSMENT OF CAUSES OF UNEMPLOYMENT

From exchanges in the North West 50 unselected unemployed skin cases (43 men and 7 women) were medically examined, and their occupational, social, and medical history was taken in detail The method of assessment used is shown in table V

The figure on the opposite page shows the relative importance of each factor in maintaining the unsatisfactory condition of the patient It will be seen that the malady itself ranked low in comparison with the dominant position of unsatisfactory work records and social problems

Length of Unemployment

Unemployment among the disabled in a time of full employment—98 5% of insured men are today working—is itself a disability due to many factors and leads to further unemployment (Hewitt 1949) It indicates deep seated medico social difficulty and it is found among inadequate people The point rating here is based on duration of unemployment up to the time of interview The shorter the duration of unemployment the more favourable the prognosis

TABLE IV—RESULTS OF ONE YEAR FOLLOW UP IN 100 UNEMPLOYED DISABLED SKIN CASES

Satisfactorily resettled	36	Rejected as unsuitable for D P register—no evidence of skin disability No follow up	9
Found work themselves and satisfactorily re settled	19	Not satisfactorily resettled	1
		Failed to reply	5
		Found work but not maintained	1
Number in employment at the time of examination	10	Unemployed	19
	65		35

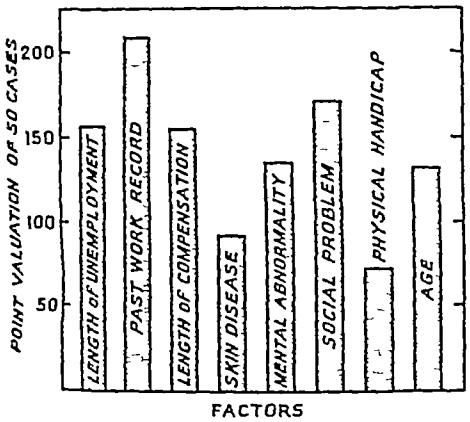
Previous Work and Unemployment Record

The rating of work records was based on a knowledge of the man's employment record since leaving school Those most highly rated were men with long spells of unemployment or those with a history of a large number of jobs in a relatively short period interspersed with

TABLE V—METHOD OF ASSESSMENT

Point rating	6	5	4	3	2	1	0
Length of unemployment	37–48 months	25–36 months	13–24 months	7–12 months	13–26 weeks	5–12 weeks	1–4 weeks
Work record	Very bad	Bad	Fair	Fairly good	good	Very good	Excellent
Length of compensation	37–48 months or still in receipt of whole or partial	25–36 months	13–24 months	7–12 months	13–26 weeks	5–12 weeks	1–4 weeks
Severity of skin disability (objective)	6	5	4	3	2	1	0
Degree of mental abnormality	6	5	4	3	2	1	0
Degree of social problem	6	5	4	3	2	1	0
Extent of other physical handicaps	6	5	4	3	2	1	0
Age in years	61 +	56–60	51–55	46–50	41–45	36–40	35 and below

periods of unemployment, the lowest rated were those who had remained in the same job for long periods with no unemployment, or those with a few changes of jobs and no intervening unemployment Allowances were



made for the irregularity of the work of the unskilled labourer and the economic fluctuations which bring unemployment first to him A man's working career was assessed on his record before the onset of the skin disease, for this new factor was often a heavy handicap which disturbed his former occupational stability Grossly unsatisfactory work records were the salient feature in this group of cases To many the onset of the skin trouble seemed to suggest a means of early retirement with a relatively contented state of mind Others, after a series of attempts to return to work for successively smaller periods, lapsed into a state of complete unemployment In some the skin condition began on return to work after long spells of unemployment, or (in the case of the women) on returning to work because of economic necessity or war exigency after a long settled period of domesticity In the majority, however, the skin condition appeared to be the culminating upset in a working life generally unsatisfactory from other causes and seemed indistinguishable from other types of breakdown

Occupational resettlement depended on the kind of work available in the local industries The general demand among these men and women was for light and clean work when previously they had only been accustomed to the heaviest and dirtiest work For example, a woman of 54 of low intelligence who had always worked as a charwoman sought a job free from dust, liquids, oils, chemicals, and fumes Any job she could be offered was of course unsuitable because it was likely to provoke a recurrence of the skin condition

Compensation or Industrial Injury Benefit

This was rated according to the length of time for which it had been received The heaviest rating, 6, was given to those who had received compensation for 37–48 months or to those who were still in receipt of partial or total benefit Most of this group feared that return to work would result either in their rejection or loss of compensation payment The longer the compensation and invalidity, the more unhealthy becomes the patient's attitude towards a return to work Discussions with shop stewards, union secretaries, and solicitors, and the unnecessarily multiplied medical consultations, all tend to accentuate his anxiety about his skin condition and reduce the likelihood of a healthy attitude towards employment

Degree of Skin Disability

The following types of skin disease were encountered

(1) *Eczema and seborrhœa* (47 cases)

Seborrhœic dermatitis	18
Unspecified eczema	24
Sycosis	2
Acne vulgaris	2
Acne rosacea	1

(2) *Other conditions*

Psoriasis	1
Chronic leg ulcer	1
Lupus erythematosus	1

The 18 cases of seborrhœic dermatitis had easily recognised lesions in the scalp, retro auricular axillæ folds, pubic region, and interdigital spaces of the feet The "*eczema*" lesions were chiefly of the patchy or discoid type and were largely restricted to the extremities A few had a pompholyx response with vesicles between the fingers Most of the cases were of the chronic type with thickened lichenified skin, accentuation of the normal skin markings, erythema, desquamation, and fissuring A few showed palmar discs of hyperkeratosis and fissuring

Both cases of *acne vulgaris* were in young men they were slight to moderate in severity, but they were associated with an abnormal degree of self-consciousness Both these patients had unsatisfactory work-records and domestic social problems The patient with *acne rosacea* was a young man discharged from the Forces with a severe anxiety neurosis after being a prisoner of-war in Japan

Of the 2 cases of *seborrhœic sycosis*, 1 was moderately severe with active lesions and marked residual scarring in a man with a bad work and sickness record and a parallel history of miners' nystagmus In the other case no activity was visible but the man had an atrophic and telangiectatic skin, the result of excessive X-ray treatment He had an obsessional attitude towards employment lest his skin condition should be revived by any form of work

The other 3 patients were

1 An elderly man with slight *psoriasis* on both legs He had severe myocardial degeneration with early symptoms and signs of congestive failure which he chose to ignore in favour of the visible skin disorder

2 An inadequate youth with a large *leg ulcer* of uncertain origin which had not responded to hospital treatment (inpatient or outpatient) over three years He had done little work before or after its onset and had become inured to a state of chronic invalidism

3 A woman of 26 with a severe disfiguring facial *lupus erythematosus* with gross circumoral scarring She was four months pregnant and had a child of 7, a lodger, and a large house to look after She was looking for work because her husband, a drunkard, ill treated her and offered no financial support Her work record was good but the combination of factors had made her unemployable

In only 3 patients was the objective appearance of the skin trouble likely to render employment difficult

The 35 who had previously been certified as suffering from industrial dermatitis all belonged to the seborrhœic eczema group and were indistinguishable from the constitutional type In 14 of the 35 there were no active skin lesions, and their unemployment was due to other factors, such as the fear of recurrence if any work was undertaken Such assertions as "The skin trouble will come back if I get a job and sweat," or "I am not taking any risks at all through going back to work" give some idea of this frame of mind The sickness records of these patients were particularly unsatisfactory, but it was difficult to elicit a true picture Many of them in the early stages of the condition, after an initial spell off work, had returned to their old employer for a few days or weeks, but recrudescences had led to successively longer spells of sickness and served to convince the patient that his skin condition was due to irritants encountered at work—though most of them on their return had been placed in jobs far removed from any primary irritant and in which no possible hazard was present

Many of the cases had occurred during war time in Government factories and the personnel had been maintained in light jobs with some success until the end of the war They had then fallen back on compensation and many were still waiting for their claims to be settled Treatment of these cases by the works medical officer was unsatisfactory

Mental or Emotional Abnormality

Though most of the skin diagnoses were of the eczema seborrhœa diathesis, no mental characteristics common to all of them were apparent The majority were of inferior calibre physically and mentally, and the general term constitutional inadequacy was appropriate Sub normal intelligence was the most usual finding It was well defined in 12 cases and seemed excellent ground for superimposing emotional abnormalities, of which the commonest variety was a mixture of obsession about the skin condition and an almost hysterical state inhibiting the use of the hands and preventing the patient from doing any work The reluctance to return to work may have been based on dread of recurrence of the skin condition, but it seemed much more to resemble a hysterical symptom This view was supported by the general apathy of these patients, their lack of ambition to work and earn a wage, and their obvious dependence on others, including the State, coupled with their unsatisfactory work and sickness records Those who had had many jobs were sometimes obviously unstable in temperament and often moved from one firm to the other on *grounds of industrial misconduct* Persistent anti social behaviour was noted in 3 patients, one of whom was the child of divorced, drunkard parents, educated at a reformatory school She had deserted her husband and four young children The skin disability, though healed at the time of the interview, was her third industrial accident that had been compensated by lump sum settlement within five years

In the following 3 cases there was a severe anxiety neurosis

1 A collier with an excellent work record and a large dependent young family He had what appeared to be a constitutional *seborrhœic dermatitis* and, in addition, a moderate degree of hypertension When seen he was actively discussing his case with solicitors, union officials, &c, and though technically seeking employment and receiving unemployment benefit, he had been advised by his solicitors not to return to work and was greatly upset by his dilemma

2 An elderly man with *eczema* on the hands since childhood, who had abandoned an exceedingly good lifelong business three years before on hearing that his only son had been killed in a flying accident He was in a most pathetic brokendown state with exacerbation of the skin condition and a moderate degree of hypertension

3 A woman of 32 who had recently married a man of 81 and had as a result been ostracised by both families She was also pursuing her claim for industrial injury benefit on account of a coincidental outbreak of *eczema* on her hands

The aggrieved and aggressive attitude associated with compensation cases was obvious both where the case was still pending and where there was dissatisfaction with the settlement

Social Problems

According to the Registrar General's classification of *social class*, 3 belonged to grade III, 1 to grade IV, and 46 to grade V Because of their disability, the 4 men in grades III and IV were now seeking unskilled work

Their *school records* showed that 45 had attended elementary schools but 6 were still in a very low form when they left, 1 had received his whole education in an orphanage and 1 at a special school for the deaf and dumb, and 2 had been educated chiefly at reformatory schools Only 1 had attended a secondary school, and he had left after three years because of difficult domestic circumstances

The *income* of the group consisted of unemployment benefit, extended benefit, or payment from the Assistance Board In 9 cases compensation, whole or partial, was still being paid, and a number were still living on the remains of their lump sum settlement As one man said, "My compensation is my wage now" Another revealed his weekly *compensation* cheque for £2 8s 11d with some satisfaction The wives of 5 men were working many men had adult children supporting them or living with their wives and families in lodgings at the parental home Of the 7 women, 3 had husbands who were working and the remaining 4 women were housekeeping for parents or siblings who were wage earners Many were receiving family allowances

The total family income of one man who was staying at home to do the housework was £8 13s 4d He had no signs of active skin disease and was keeping two pigs and fifty head of poultry He was getting compensation and he remarked that if he had a bit of capital and could get his case settled he would like to set up with *pigs and poultry*

Other social problems included people who were separated, or divorced Some of the elderly men had invalid wives Deaths among near members of the family were another source of trouble, 2 patients had been to prison and 1 was an Army deserter

The fear of skin disease and dermatitis is prevalent among employers and fellow workers, who are generally ignorant of its real nature, are afraid of infection, and *associate it with uncleanliness and venereal disease* The self consciousness of the man or woman who has visible skin lesions constitutes a social disability, which, together with the skin disease itself, produces an ostracism like that experienced by the epileptic and tuberculous industrial dermatitis, real or alleged, is more destructive of morale than is generally recognised

Other Physical Handicaps

Of the 50 patients, 28 had additional disabilities though few were serious Hypertension (5), dyspepsia (5), bronchitis (3), and deafness (3) were the most common There was a deaf and dumb youth of 18 and a man with severe myocardial degeneration, but in the remaining 10 the second disability was slight Of the cases of bronchitis 2 had associated eczematous lesions from childhood and were of the syndrome comprising eczema, asthma, and hay fever Of the 5 cases of dyspepsia 2 had duodenal ulcers Most of the group were of poor physique but there was no evidence of malnutrition secondary to poverty

Age

Increasing age worsened the prospects of resettlement as one man remarked "If you get dermatitis, no employer wants you, especially as you get older" Age in itself is a disability, particularly amongst men who are only capable of unskilled labour, and in this group 36 men were between 41 and 64 years old Age is one of the most important factors considered by employers when hiring labour and certainly one of the most easily ascertainable Training for a new skill is seldom practicable in men over 35 Furthermore, the lighter jobs, most desirable for the elderly, are usually done by women

DISCUSSION

This is an investigation into the failure of people with chronic skin diseases to adapt themselves to their disability, which leads to the interruption of their working life by sick absence and unemployment It is hoped that the findings will help workers who are trying to prevent this happening Imperfect mental adaptation to chronic disability plays a great part in long continued sick absence from work and unemployment amongst disabled persons, particularly those with chronic skin disease

People with skin diseases provide an invaluable opportunity for investigation, because the extent of their physical incapacity can be directly observed Assessment of incapacity from emotional, mental and social problems is purely subjective and cannot be scientifically accurate but no apology seems necessary for their inclusion in this paper, in view of their paramount importance and

the tendency for them to be omitted in the development of specialties

Fuller consideration of problems other than the purely dermatological ones may enable doctors to help patients before the stage of chronic sickness and unemployment, or resignation to both, is reached

The points raised serve to show the close relation between the disability state, social environment, and occupational record, and that each can only be fully appreciated by consideration of the others The basic causes of the unemployed state and of prolonged sick absence from work appear to have much in common

Valuable resettlement services are available for skin cases which are not being fully used The largest group of sufferers are those ostensibly breaking down with industrial dermatitis, and though they present themselves with skin trouble they have many other problems which tend to be lost sight of

I have not tried to compare the factors recognised in this series with those responsible for inability to obtain work among other groups of disabled But I believe that similar research among these groups would give similar results

SUMMARY

The resettlement of skin cases seeking employment at a late stage of their illness is difficult to secure A study has been made of 50 unemployed disabled persons suffering from skin disabilities registered at employment exchanges in north west England Histories were taken, social detail and employment records analysed, and the patients clinically examined The following main points were elicited

Unemployment amongst these patients is due to more than one factor

Out of 50 patients 46 were unskilled

Out of 50 patients 47 were found to have seborrhœic eczema

Out of 50 patients 35 had been certified as suffering from industrial dermatitis

The effect of such diagnosis and certification seems usually to have been unfavourable to prognosis

Unemployment in registered disabled persons with skin disease is a symptom calling for full medical social investigation.

I am indebted to the Regional Controller and my colleagues in the Ministry of Labour, North West region, for their helpful co-operation, to Prof. R E Lane for criticism, and to Dr J H Wiston Davies for encouragement and advice in the preparation of this paper

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In the clinical years too, instruction is pieced together [illegible] of the contributions of independent departments, which [illegible] differ as much in their philosophy as in their techniques [illegible] much of it is given in the hospital wards, where the [illegible]dent finds only people sick enough to be abed. For a [illegible]ple of the great majority of patients, who are not sick [illegible]ugh to be abed, he must go to the outpatient department, [illegible] is commonly organized in such a way that it is hard [illegible] the student to learn, or for the patient to find coherent [illegible] comprehensive medical care Only by the grace of God [illegible] rarely becomes operative until after the young doctor [illegible] his medical degree and [illegible] medicine learn [illegible] Annual Report of the [illegible] Fund, 1950

PINK DISEASE

LECTURE BY SIR STANTON HICKS

SIR STANTON HICKS, speaking on Dec 12 at the Ciba Foundation, London, traced the history of the recognition of pink disease, particularly in his native Australia At one time, he said, this disorder was known by nearly thirty different names, including erythrœdema The title "pink disease" was adopted in 1914 by Swift, of Adelaide In his later reports Swift emphasised that this is no rare disease—an observation fully confirmed since then

Cheek, in 1949, found 136 cases in the records of the Adelaide Children's Hospital over a 10 year period—and this despite a policy of treating such cases in their homes to minimise cross infection Of these 136, 18 died, and half of the deaths were attributed to broncho pneumonia Cheek noticed that the areas with heavy incidence of pink disease correlated roughly with those of swayback in sheep Swayback was known to be associated with cobalt deficiency, and so he turned to the possibility that a mineral trace element deficiency might also give rise to pink disease With the help of a spectroscopist to determine plasma cations by flame photometry, he studied the sera of 16 cases of pink disease and 16 controls The plasma sodium levels of the control group were normal, whereas in the cases of pink disease the level was consistently lowered beyond the limits of error of the method This finding, and severe non pitting œdema in a fatal case, directed his attention to electrolyte and water metabolism

At this point he consulted his former teacher, Sir Stanton Hicks, head of the department of physiology in Adelaide University, and a large scale investigation was planned Clinicians were invited to coöperate by referring their cases to the hospital, and in consequence the earlier finding of lowered plasma-sodium was confirmed Hæmoconcentration, as shown by the hæmatocrit and red blood cell count, was also common, and had in fact been recognised in this condition for some fifty years There thus emerged a picture of decreased plasma and extracellular fluid volume, sometimes associated with overhydration of the cells

The milder cases were treated with extra sodium chloride (about 8 g daily), and the more severe cases also had 3 mg deoxycortone on alternate days The response to this treatment was uniformly good, reducing the average stay in hospital from 3–4 months to as many weeks The main symptoms of irritability, apathy, and sleeplessness usually disappeared in about 2 weeks, but the extremities might remain pink a little longer

With such a background Hicks and his group had evolved a theory of "fractional hypofunction of the adrenal cortex" to account for the disease The maximum age incidence coincided with the period of gross morphological change in the adrenal cortex, in which the adult layers developed to replace the involuting, relatively larger, fœtal cortex, at such a transitional period disturbances of function might be especially prone to emerge In South Australia the allergic diseases of infancy also had a peak at this age Another theory which the Adelaide school had earlier favoured, was of functional overactivity of the adrenal medulla. This would explain the tachycardia, high diastolic blood-pressure, and common initial fever and excessive sweating, but it did not account for the newer findings of low plasma sodium and the response to sodium chloride and deoxycortone The infection theory certainly could not be eliminated, but the common occurrence of large tonsils and adenoids might simply indicate adrenal cortical hypofunction Possibly infections brought out symptoms of an adrenal cortical deficiency which was previously latent The theory of mercury poisoning was still sub judice, largely from confusion due to mercury

in teething powders sometimes given for symptoms which might be those of incipient pink disease

CLINICAL PICTURE

Clinically, the child, aged usually between 6 months and 2 years, was abjectly miserable, with apathy, irritability, insomnia, and anorexia The skin of the extremities was swollen, sweating, and usually cold There was a sluggish circulation through dilated capillaries, giving a pink colour in warm surroundings and a cyanotic hue in cold The skin was continually burning, tingling, or itching, and was hypersensitive to common stimuli, so that warm water felt painfully hot Such swollen, raw-looking, sweating extremities, sometimes also desquamating and injured by continuous rubbing, contrasted strongly with the dry scaly skin over the emaciated trunk The muscles were hypotonic and weak, although continually producing writhing and wriggling movements and the tendon reflexes were reduced or absent Characteristically the child buried his head in the pillow to protect his eyes from the light, and persistently rubbed and scratched his tormented hands and feet Early on there might be fever as well as tachycardia, raised diastolic blood pressure, coryza, and leucocytosis For many months after the acute phase the child's health was likely to be subnormal.

RESPIRATORY MECHANISM AND HYDRATION

Fœtal arterial blood was only about 63% saturated with oxygen, and yet the oxygen utilisation reached 75% as against 31% in the mother, whose arterial oxygen saturation was 95% Armstrong had shown that in animals intermittent anoxia led to adrenal cortical hyperplasia Furthermore, adrenal cortical extract improved the survival rate of anoxic animals These facts suggested that in infants with inadequate adrenal cortical reserve the respiratory mechanism might be abnormal.

At birth the proportion of body-water was only 10% more than in the adult, but the newborn had relatively much more in the extracellular compartment Bearing in mind that the infant's kidney could not concentrate well, and that glomerular filtration approached the rate in adults only after the first 5–6 postnatal months, the special vulnerability of the infant to factors altering its hydration became understandable In South Australia mothers tended to limit their infants' salt intake so that, especially in hot weather, there might be actual sodium deficiency, and perhaps this might explain the relatively high incidence of pink disease in this area Administration of hypotonic saline only accentuated the disturbance, whereas hypertonic saline corrected it If older marantic children who were having episodes of cyclical vomiting were examined for adrenal cortical hypofunction, a tendency to low plasma sodium might be found, and an unduly high proportion of these patients had a history of previous pink disease These cases, Sir Stanton suggested, might be due to a milder deficiency of adrenal cortical reserve, and might also respond to treatment with sodium chloride

STOMATITIS

A vote of thanks was proposed by Dr S L SIMPSON and seconded by Prof A A MONCRIEFF Both admitted that some features of pink disease were still difficult to understand Professor MONCRIEFF mentioned in particular that the stomatitis of the textbook description of the disease was notably absent from its modern form It was hard to explain the raised diastolic blood pressure on a basis of adrenal cortical insufficiency, and his experience in England had not corroborated the findings of low plasma sodium levels Possibly the pink disease of Australia was different from that in this country

Medicine and the Law

The Courts and the Period of Gestation

WITHIN limits carefully defined in legal textbooks our courts confess judicial knowledge of certain simple facts of nature without requiring them to be proved by evidence In Preston Jones *v* Preston Jones,[1] decided in the House of Lords on Dec 14, Lord Simonds observed that it had never been doubted that the court had judicial knowledge of the normal period of human gestation

The normal period, it seems, has been variously stated, it was taken, for example, as 270–275 days in 1887 (Bosvile *v* Att Gen) and as 273–278 days in 1889 (Burnaby *v* Baillie) Subsequent litigation has taught the judges something about abnormal periods In the Gaskill case in 1921 Lord Birkenhead held that a period of 331 days could not be regarded as impossible in the then state of medical knowledge In Wood *v* Wood, where there was no medical evidence, the Divisional Court took the same view of a period of 346 days Early in 1949 the Divorce Court allowed even 349 days to be a possibility (Hadlum *v* Hadlum[2]) As the number of days continued to rise, the judges clearly found it necessary to draw the line somewhere In the recent Preston Jones case the figure of 360 was in effect (though the judges were not unanimous) declared to be on the wrong side of the line

Mr and Mrs Preston Jones were married in April, 1941, a daughter was born a year later On Aug 13 1946 a second child was born The husband petitioned for divorce in the following November He contended that this second child had been conceived between Aug 29, 1945, and Feb 13 1946 During the whole of that time he was absent from the United Kingdom while his wife remained here He alleged that it was not his child and that its conception was the result of an act of adultery The divorce commissioner dismissed the husband's petition. The Court of Appeal ordered a re hearing

1 See *Lancet* 1949 *i* 586
2 *Ibid* 1948 *ii* 123

The case being re opened Mr Commissioner Blanco White found that the husband had been absent from the United Kingdom between Aug 17, 1945, and Feb 9, 1946 The wife had suggested that her husband had visited her in the intervening November but this the commissioner did not accept. He further found that the birth of the child (which weighed 8¼ lb) was apparently normal and that it could not have been begotten as the result of marital intercourse on or after Feb 9 1946, the date on which the husband arrived home. The commissioner had then to ask himself whether the fact that at least 360 days had elapsed between the last possible intercourse between husband and wife and the birth of the child, together with the medical evidence, put it beyond reasonable doubt that it was not the husband's child The commissioner, who apparently found the medical evidence inconclusive, held that he would not be justified in finding that the wife had committed adultery, he dismissed the petition Once more the husband appealed and once more the Court of Appeal directed a re hearing it might it seems, have granted the husband a decree outright, had there not been some question of the admission of certain correspondence at the trial

By a majority of four to one the House of Lords has now allowed the husband's final appeal and has remitted the case to the High Court in order that the proper decree may be granted

There remains, however, a further problem of judicial knowledge or ignorance in cases of this kind By the normal period of gestation the courts mean the time between conception (the union of the male and female cells) and birth Recent cases have caused the judges to consider the possible interval between coitus and fertilisation In the Gaskill case it was suggested that this latter interval might be so long as 21 days, in the Hadlum case one of 14 days was referred to In M T *v* M T, in the latter part of 1949, when the divorce judge refused to accept the possibility of a normal healthy baby being born after an interval of 340 days between coitus and birth, a gynæcologist had stated in evidence that he had never heard of an authentic instance of an

nterval of 21 days between coitus and fertilisation Lord Simonds asks if judges can, without evidence, take ıote of the possibility of some such interval Can they, vithout evidence, he asks, refuse to entertain the possi ibility of a 30 day, 60 day, or 90 day interval between coitus and conception? He thought that ordinary men and women would regard it as a fantastic suggestion that a normal child born 360 days after the last intercourse between husband and wife could be the child of the husband "It is to me repugnant," said Lord Simonds, "that a court of justice should be so little in accord with the common notions of mankind that it should require evidence to displace fantastic suggestions" In the Preston-Jones case the only medical evidence was that of a doctor whose training and everyday working practice must have made him familiar with the ordinary problems of gestation and birth This witness admittedly had not studied the problem of the maximum period from the time of coitus to the time of the impregnation of the ovum, but his earlier answers showed that he regarded as impossible an interval which would defer a normal child's birth until 360 days after coitus The doctor was, in Lord Simonds's opinion, entitled to give that evidence "as a matter of competent medical opinion" even though he had made no special study of the subject The divorce commissioner was not justified in disregarding the doctor's evidence He was, as a matter of judicial knowledge, entitled to know that there were abnormal cases of gestation as well as a normal period, but he was not entitled to set his own view of possible abnormality, whether derived from the reported legal decisions or from other sources, against the evidence which he had heard. Having found the facts as stated, the commissioner should have acted on the medical evidence and should have granted a decree of divorce

Parliament

The Minister and Registrars

EIGHT Opposition Members including Dr Charles Hill and Mr Hugh Linstead, have tabled a motion in the House of Commons on the Ministry of Health's proposal to reduce the number of hospital registrars The motion regrets the Minister's decision, announced in the debate on Dec. 15,[1] to proceed with the proposal during the parliamentary recess, in view of the strong dissatisfaction expressed with the policy on both sides of the House The recess began on Dec 15, the day on which the debate took place, and continues until Jan 23

QUESTION TIME

Medresco Hearing-aids

In answer to a question Mr ANEURIN BEVAN, the Minister of Health, stated that deliveries of 'Medresco' hearing aids to manufacturers were averaging 8116 a month

Hospital Registrars

Mr M C HOLLIS asked the Minister whether, at his consultations with the representatives of the doctors concerning the issue of the circular on the reduction in the number of registrars in hospitals the doctors agreed to the issue of the circular —Mr BEVAN replied The circular was discussed in detail with the profession's representatives, and modifications were made to meet certain points they raised, but they did not feel able to agree with the final draft in every respect

Diagnosis of Cancer

Brigadier FRANK MEDLICOTT asked the Minister if he was aware of the delay which occurred in many cases before persons suffering from cancer sought proper medical attention, and if he would take steps to make it more widely known that valuable remedial measures could be taken in many instances if the disease was diagnosed in its early stages Mr BEVAN replied I agree that the facts are as stated by the hon. Member The Central Health Services Council have carefully considered that it is undesirable at the present time to embark on any extensive publicity to be carried out by any central government organisation direct to the general public

[1] Lancet, 1950, p 877

In England Now

A Running Commentary by Peripatetic Correspondents

THE other week I attended the inaugural meeting of a local poetry society I knew that all would be well directly my eyes fell on the instigator, a tall smooth young man with a luxuriant jet-black beard He had two confrères, who were obviously accustomed to reading verse aloud in strong vibrant tones—and did One of them embarked on a survey of English poetry, starting with Chaucer, the other read short extracts of poetry, as illustrations, I found the Chaucerian rhythms most attractive

Besides these three and myself, there was the instigator's wife—a pleasant girl with nothing unusual about her—and a middle aged civil servant with wife completed the party The wife had no use for poetry, the civil servant had presumably brought her along because he did not want to leave her at home He said that poetry had always been a passion of his and volunteered to read some, the poem of his choice was "Tell me not in mournful numbers" He read it with dignity, explaining the more ambiguous portions What a bad poet Longfellow is, and how poorly he expresses himself For example, is the poet telling us that life *is* an empty dream, or merely that he does not want to be told so in mournful numbers?

When the civil servant had finished, the bearded instigator, out of sheer devilment, volunteered to read Eliot's *Sweeney Agonistes* It was read with tremendous gusto—gusto is the only word which adequately describes his huge joy in the presentation of this remarkable poem His two confrères joined in the chorus, which, you will remember, is all about bamboos I enjoyed it tremendously, though why "I did a girl in, I did a girl in," is considered to be a line of poetry I find it difficult to understand The civil servant said he did not like Eliot (I am sure his wife, too, failed to appreciate *Sweeney Agonistes*) At this stage I was asked what I would like to read, but I firmly refused to read anything at all

The setting was in keeping with the proceedings—a small front room in a suburban house a few chairs (some garden chairs) and two bookcases a cubist design over the fireplace a few geometrical figures on one of the bookcases, made of springs, coloured wire, and little spools some "mobiles" in the hall coffee (very good coffee, too) on orange wood tray on floor two siamese cats, wending their ways in and out among the chairs, climbing up to be fondled and occasionally emitting strange hoarse cries I shall certainly go again

* * *

Those of us who did our "district" (practical midwifery to you) in London north of the Thames will remember the Regent's Canal as a useful landmark for locating obscure addresses and a source of simple entertainment during waiting periods Glimpses of the canal can be had in a lot of unexpected places, but not until lately did I have an opportunity to traverse its full length by water The master of a Diesel engined "narrow-boat," normally trading in the Potteries, asked me to make the trip with him I had wondered whether timekeeping would be as uncertain on canals as it is on the sea, and I was not left long in doubt Our speed of progress largely depended on who won the races for the locks, and the master lived in constant fear that a small boy would bob up in a craft on the other side just in time to take possession of the lock

The journey started in north Hertfordshire following the route well known to railway passengers from Paddington or Euston The real crossing of London began at Paddington basin, a small tree edged lake as quiet as a Thames backwater For some distance after leaving the basin the canal follows a road from which I have often watched the boats pass, but now we provided amusement for others until a tunnel swallowed us up One is conscious of being a source of free entertainment at various stages of the journey, but it is frankly humiliating when passing the Zoo to be stared at disdainfully by rows of cage dwellers, mostly standing on one leg as if they are saying it is their turn now Opposite power stations and factories you are just part of the everyday life and are passed on with a friendly wave of the arm

The passage through the Islington tunnel has often

been described The first thing to do is pray that you will not meet any other boat All craft have a bow light, but ours was unreliable, so it fell to me to go forward 70 ft and be ready with a torch for untoward happenings A friend of mine who had flown to South America in the *Graf Zeppelin* once told me how he felt going along the cat-walks in the aircraft, but that was nothing to traversing what is termed the planking of a narrow-boat in semi-darkness

The holds of narrow-boats, when filled, are covered to the full width of the vessel with a special form of ridged awning Along the top of this ridge runs a springy plank 9 inches wide on which you may walk or crawl to the bows With the torch bearer safely on the tiny fore-deck we entered the tunnel If you are looking for complete detachment from worldly cares try a trip up forrard through a long canal tunnel One anxiously listens for the steady ponk-ponk of the engine, unbelievably far astern, because if it fails there is nothing for it but to pole through The wet tunnel sides, sooty from tug smoke and diesel exhaust, make this operation much more unpleasant than it was before engines were introduced The smoky lamp sheds its tiny circle of yellow light and all one can do is hope there won't be a crash with the walls or some other craft Nothing happened in our trip except that I got increasingly stiff in muscles I did not know existed Another lock was negotiated and we came to a region I used to know well, with almost forgotten street names which recalled vivid obstetric experiences of long ago And not only obstetric experiences came to mind There was the night of the street fight between two ticket-of-leave men who were always making trouble There was the celebration when the birth of a much-wanted boy coincided with a highly successful day for the father at Doncaster races Then there was the jemmy incident but I digress

London viewed from its canal becomes increasingly attractive the further east you go Gardens run down to the waterside and many of them though small are most carefully tended Then there is Victoria Park, how many Londoners living in W 1 or S W 5 have ever seen it? Our cargo was loaded for a village in Essex approached by the Stort For this reason we saw Victoria Park from a new aspect because the cut from the Regent's Canal to the Lea follows it closely This short cut is tricky to navigate, and at one place we ran aground thoroughly, causing a delay which might have been serious because the short staircase of locks into the Lea, for some unexplained reason, is padlocked at 5 P M However, all was well and once in the Lea our progress northward was rapid Darkness overtook us before we got very far so my memories of the journey end, like an early cinema film, with a slow fade out

* * *

One of the patients at the skin clinic was a little girl with an inconspicuous spider nævus on her cheek Her mother was a strikingly attractive woman I asked about her husband's occupation, her other children, her home, her activities I must own that these questions had more to do with my interest in psychosomatic factors than with the child's nævus, but she answered readily and vivaciously At the end I was taken aback when she asked, "Well, Doctor, you have been asking me questions, do you mind if ask you a few?" And she did Where was I born? Married? Children? How had I come to take up medicine? Was I happy in my work? That woman must have enjoyed her surprise counter attack Why have I never thought of turning on my inquisitors? There was that M R C P examination when a distinguished paediatrician questioned me on what I considered to be an intricacy of his specialty Why didn t I say, "All right, Sir, that is one up to you Now, would you care to discuss the differential diagnosis of the premycotic stage of mycosis fungoides?" I suspect that his difficulties might have been as great as mine had been Then there was the interview for an appointment in which I was asked what contributions I had made to dermatology I might have replied, "The few projects I have in mind will take several years to mature What original research have you done, Sir, in the last twenty years?" Which of us would have had more reason for embarrassment? But I am still going up for jobs, whereas this mother had nothing to lose

Letters to the Editor

GENERAL PRACTICE

SIR,—Dr Lennox Johnston's letter in your issue of Dec 16 very feelingly emphasises the unsatisfactory state of general practice today The growth of medical knowledge and techniques has made the general practitioner's surgery something of an anachronism, and the health service, with its offer of bounties to the patient, has made the practitioner the servant of the public in the wrong sense This would not have happened if the practitioner had been able to offer himself in his true rôles of observer of diseases in its earliest stages, adviser on the maintenance of health and the details of treatment, and interpreter of specialist opinion He has rarely the time to fill these rôles, and certainly if he has time he cannot make an adequate living in the National Health Service The essence of the whole problem is time.

This can only be provided by protecting him from the patient who comes for some return for his weekly expenditure We all hear too often "I have to pay such and such a week, and I may as well have something for it" and often this is not said but understood The practitioner must also not be tempted to take on more work than he can do Who can say No to more work and more money, especially in these difficult times?

We are loth as a profession to part with the competitive system because we feel it puts a man on his mettle but I am not sure that this is true today The salaried service has its dangers, but I feel we must ask ourselves which method now has the least evils The problem is not easy, but I feel it is in need of urgent attention if general practice is to be saved and the practitioner to regain his honoured place in society I think there is no doubt that the community would be the worse without him, and I believe that if the monetary reward could be divorced from the total of patients we should all become better doctors There appears to be a feeling that if we were not paid so much per patient we should become less sympathetic to our patients' troubles—as if much devoted care was not given before the Act to those who could never hope to pay The quality of sympathy and understanding are of the man and not the system

Blackburn FRANK LIVESEY

THE CHANGING FACE OF SURGERY

SIR,—In his address to Westminster Hospital Medical School (*Lancet*, Dec 9) Sir Cecil Wakeley shows great prejudice against the concept of whole time clinical professorships He is perfectly entitled to his opinion but it is unfortunate that he should choose to express his disapproval to medical students with the use of fallacious arguments We have no means of assessing what work Lister would have done as a whole time clinical professor, any more than we know what John Hunter's output would have been as professor of pathology at Oxford These men did their work because of the urge to do it, and not for financial reward Provided the time in which they lived was not one of oppression towards all original work, these men would have been notable whether as whole time or part-time professors The man can be superior or inferior to the appointment he holds

It is equally wrong to suggest that the whole time clinical professor of surgery must be cut off from the general practitioner In quite a few universities the whole time clinical staff have the option to do domiciliary consultations (but of course do not receive a fee) If the whole time professor declines to do domiciliary consultations, that is a loss for the individual and not a fault of the system

No system is perfect, and the criticism that a part time professor of surgery might be out of touch with the laboratory is just as valid as that the whole time man might be out of touch with the general practitioner In both cases the opportunity is there As yet it is much too early to decide whether whole time clinical chairs produce a higher standard of work—after all it is only about ten years since the institution of such chairs in any university The president of the Royal College of Surgeons has a great responsibility, and his opinion rightly carries great weight It is therefore most disappointing that he should be so damning towards an experiment which has only just begun

Department of Surgery
Medical School Dundee JOHN GRIEVE

SALICYLATE AS AN ANTICOAGULANT

SIR,—Dr Gibson's letter of Dec 9 prompts me to refer to the article[1] in which he recommended a combination of aspirin with ascorbic acid and tragacanth as an anticoagulant in coronary thrombosis and angina of effort

There are some rheumatic patients whose treatment is complicated by attacks of phlebitis, with or without obvious thrombosis In these cases Dr Gibson's formula is most valuable, as it not only prevents thrombosis but also relieves the rheumatism As Dr Gibson points out, when the mixture is given with food there is no gastric disturbance

London W 1 H WARREN CROWE

PHILOSOPHY OF CLINICAL MEDICINE

SIR,—In his lecture on the psychosomatic approach to clinical medicine, Dr Ranyard West[2] raises important questions and suggests an answer Most people will agree that when the same patient can be treated with kaolin on Thursday and by a psychological probe on Monday, clinical medicine has reached a state of theoretic confusion and of therapeutic chaos In this note I suggest that the cause of this state of affairs is that clinicians are over simplifying the clinical situation and therefore failing to make necessary distinctions in clinical diagnosis and treatment

The practical usefulness of the psychosomatic approach is not questioned, but we must ask whether that approach does not break down in practice, at the same point at which physical and psychological medicine break down—namely, when "the clinical case" transforms itself into a "living person" A person is not a hyphenated body mind, of which fact Dr West is aware when he writes "it is often the patients rather than their doctors who succeed in adapting themselves to two conflicting philosophies of medicine' How does it happen that patients can reconcile, without instruction, incompatible opposites that defy the best minds in our profession ?

Sherrington has shown *where* the integration of these opposites is achieved, even if he has not stated clearly *how* that integration is achieved It takes place "in experience," in the process of living Life psychically experienced and life physically experienced become "one life and one experience' in the awareness of the self that he is in fact an enduring entity an 'I" It has been objected that few people are aware of their continuing self identity, but, as Sherrington says elsewhere, this is due to the nature of conscious mind which has been evolved to meet practical situations and not in the interests of self awareness The mind is able to attend 'to only one main task at a time"

It seems then that, as clinicians, we may be taking the "self as a unity for granted, and studying only the 'self in its manifoldness —i e, its organs, functions, cells, and complexes Hence we have failed to grasp the clinical significance of those diagnostic factors and those therapies whose value depends upon their origin in, or their effect upon, the unity of the personality A N Whitehead has said that the problem before philosophy is to provide a satisfactory doctrine of personality and of the facts of the continuing self-identity of the organism Doctors face this problem as a need for a coherent theory and practice of personality diagnosis and therapy

W D'Arcy Thompson and his school make the same point Having demonstrated the significance of the *form* of the living organism in all biological theory, they have shown that the form (i e, the self identity) of the organism largely determines the particular shape that the organism will assume, at each stage of its life cycle. C G Jung makes the same point—as is well brought out by J Jacobi in her study of Jung's work By insisting upon the significance of the "formal" causes of mental behaviour as well as upon the "efficient and final" causes of it, Jung makes an important practical distinction Some students of Freud hold that the doctrine of the super ego, if followed to its logical conclusions, leads in a similar direction The increasing importance attached to "purposes, life aim and life styles" by other psychologists reveals a similar trend Many general practitioners are realising that the "disorders of personality" are of great practical importance in clinical medicine in general, and in the preventive diagnosis of illness in particular It seems reasonable to suggest, therefore, that a concerted attempt should be made to separate the "formal" or "personality disorders" (together with their clinical antecedents and consequents) from the many syndromes, &c, that have been distinguished hitherto solely by paying attention to disorders of the "manifold"—i e, the psychosoma, or the body, or the mind (when this has been viewed as an 'organisation of instincts")

Following this line of thought, some of the more obvious disorders of personality—sometimes called disorders of "attitude" can be indicated

1 There is a large clinical group of patients who manifest syndromes of despair The basic psychology of this group was discussed by Kirkegaard many years ago In practice three clinical varieties of this syndrome can be distinguished (*a*) the despair of ever becoming an individual which is the commonest personality disorder of the young (*b*) the despair of ever becoming a self (i e an integrated personality) which is the commonest personality disorder of those under, say 35–40 years of age and (*c*) the despair before death (also called the eternal despair) to which Dr West seems to refer when discussing the death acceptance instinct' and which, as Jung insists is the psychological disorder par excellence of middle and later life All of these despairs are unconscious Whenever they are made fully conscious, they are in a fair way to being cured as a rule

2 The major syndromes produced either by an arrest or by a repression of normal personality evolution are also well recognised They are accompanied by recognisable effects and by certain peculiar disturbances of the normal awareness of self identity" and of the normal awareness of reality Examples of the personality regressions" are to be found in every mental hospital

3 Again certain critical ages in the normal evolution of the personality are recognised. These are age periods during which arrest or repression are most liable to occur and they mark periods of transition from one stage to another In the evolution of the integrated personality from its early antecedents in the innate character of the infant Childhood, adolescence, maturity (about 35), and middle age are the dangerous ages in the evolution of the personality If we agree to call the innate form of the infant by the name character, then the integrated mature personality may be said to be the form of the mature adult and so on. In this sense character is innate, while personality is in part determined by innate qualities and in part by experience

All attempts hitherto made to isolate a group of basic instincts complexes, or sentiments, capable of

1 Gibson, P C *Lancet* 1949 ii 1172
2 West R. *Ibid*, 1950 i 1025

serving as a sound theoretic basis for the diagnosis of personality, seem to have proved unsuccessful The same is true in the field of social psychology where the hopes raised by Pareto's original analysis seem to me to have faded Similar failures attended the efforts of the old faculty psychologists and of the system physiologists (as J S Haldane insisted) I suggest, then, that all of these failures have arisen from the same cause—namely that attention has been concentrated exclusively upon the manifoldness and not upon the unity of the self, upon the psychosoma and not on the personality

On the practical side, this new approach to medicine offers the clinician the help of a number of "therapies of personality" (as the Americans term them) At one extreme those include suggestion, prestige therapy, and the morale therapies They include also a wide variety of therapies by occupation, by arts, crafts, and play, also some new group and social therapies that are now being actively studied, and, of course, education, persuasion, and other methods of personality healing Finally there is a group of therapies of which more may be heard in the future—namely, various specifically religious therapies all of which call for careful study by clinicians

The importance of revising medical theory and practice in the direction here proposed can hardly be overemphasised The new approach will be found to complete, rather than compete with, established clinical methods If I am right, it will clear up the prevalent intellectual muddle, enable the general practitioner and the specialist to work together towards a single end, open up new avenues in therapeutics, and bring medicine into line with recent advances in biology and philosophy

Worcester HOWARD E COLLIER

CEREBRAL PALSY

SIR,—I am sure that no articles which you have published have contributed more to the understanding of each disease as a problem affecting all aspects of the patient's life—physical, psychological, social, and financial—than have those in your excellent Disabilities series Of these, none has made a deeper impression on me than that on cerebral palsy (Dec 16)

Here is a disability which is seldom treated by parents or friends with understanding, and no wonder, since even the neurologist may find difficulty over the details of diagnosis It is perhaps because of this uncertainty as to the problem to be tackled that orthodox medicine has in the past paid so little attention to the final and, in the end, the most important question What can be done? It is appalling that an adult woman should be able to report that only "within the last two years I have benefited from specialised cerebral-palsy treatment" Previously, she had helped herself laboriously through inarticulacy to speech, and through uncontrolled movement to the achievement of functionally adequate, though slow and awkward, performance Surely the fact that she has benefited from her recent specialised treatment suggests that an understanding of the nature of the *disability* may, with our present knowledge, form a useful basis of treatment

This article can leave no doubt in the mind of any reader as to the possibility that a patient with cerebral palsy may yet be highly intelligent It is a sobering thought that others, with less inspired parents, with only a little less intelligence or determination, or with a slightly more severe disability, fail in the struggle for lack of skilled help, to pass their days excluded from all society in a back room or incarcerated in a home for mental defectives

Much is already being done, and local authorities are now obliged to provide for the education of every child capable of benefiting But without highly skilled guidance such education can do little to make these children socially acceptable, and so will be largely wasted Our aim should be to undertake treatment of these children from the first moment in infancy when abnormality can be detected, when their adaptability is greatest, so that as many as possible may, by school age, be fit to go to normal schools without the disadvantages described by your contributor, and so that no intelligent child need exhibit unintelligibility, drooling or others of the grotesque handicaps which often militate against social acceptance or employment

So far only one hospital has undertaken, through a research unit and an advice clinic for parents, the difficult task involved The value of its work, only now becoming appreciated, gives us a pointer to the future

London, W 1 WILLIAM DUNHAM.

GERMAN MEASLES IN GIRLS' SCHOOLS

SIR,—Mr Robinson (Dec 16, p 827) appears to have overlooked the possibility of one of his daughter's school friends having a pregnant mother

Silver End Essex J W NICHOLAS

STUDY OF DELINQUENCY

SIR,—One sometimes doubts whether it takes two to make a quarrel, and I have no wish to offer myself as a protagonist, particularly as I some time ago published views which largely agree with Dr Stott's Thus "The reliable report is based on painstaking, sometimes even tedious, collection of data There is no short cut We have no crystal ball" [1] And "Where the psychiatrist has insufficient time to study his cases and to interview the parents, the magistrate will be justified in considering that as good a guess may be made in the court room as elsewhere" [2] In the same paper psychiatrists are urged to follow up the results of their recommendations and to be prepared to modify the treatment after placement away from home These and other points, such as the use of psychiatric jargon and loose terms, and many more not mentioned by Dr Stott, have been dealt with in lectures for some years I find having made a lot of mistakes a good basis for teaching

I would, however, like to take up the point made by Dr Stott (Nov 25) about treatment being too "clinic centred" With this I agree, but he also says in this connection "A refusal to treat, or a picking or choosing of our patients, will only damage our reputation among the magistrates" In my experience with both juvenile and adult court work, precisely the opposite obtains The magistrates, and any other experienced workers in the field, know full well that in the present state of our knowledge only a proportion of seriously delinquent cases are amenable to clinic treatment I believe magistrates simply want to know if a particular case will respond at home with help, or whether some other course must be taken They will therefore appreciate a frank statement upon the matter, they do not these days expect the clinics to perform wonders with impossible material Dr Stott reports two hearsay cases in which clinicians refused to see cases which were "too bad" and "uncoöperative" respectively This as he reports it, sounds very shocking But if the two clinicians had in fact declined to treat the cases in their clinics because they appeared unsuitable for such treatment, and if they indicated what other course should be adopted, then these ignorant clinicians might after all be quite sensible people

We are asked to "imagine what would be said of a family doctor who refused to treat a patient because he did not respond to his one and only prescription" But this is unduly difficult to imagine, because the training of family doctors (like that of psychiatrists) provides

1 *Probation*, 1949 5 286
2 *Proc R Soc Med* 1948 41 201

them with a range of treatment methods and encourages them to use inpatient or residential care when the illness is severe or the home deleterious

Anyway delinquency is a big field and there is lots of scope for workers of different trainings to work together, as in fact they seem to do quite successfully

London W 1 PETER SCOTT

RUPTURE OF ASCENDING AORTA

SIR,—Your issue of July 8 contained an interesting report, by Dr Jokl and Dr Mackintosh of a case of rupture of the ascending aorta I encountered a similar case at St Alfege's Hospital, Greenwich

The patient a married woman aged 24 was dead when brought to the hospital The relatives stated that she was three months pregnant and had one child aged 18 months who suffered from heart trouble At 11 15 P M after taking two glasses of ale she went to the lavatory where she collapsed She was found unconscious and did not regain consciousness When seen in the ambulance two and a half hours later at 1 45 A M there was no sign of life

Post mortem examination showed gross œdema of the lungs with subpleural ecchymoses and on the left some interlobar adhesions The heart did not seem enlarged but the myocardium appeared anæmic, no abnormalities of the valves were noted The ascending aorta was dilated forming a wide aneurysmal bag the inner coat of this section of the aorta was in places detached from the media Two tears were visible one penetrating to the adventitial tissue but not perforating and the other leaking into the pericardium which was filled with large blood-clots The descending aorta was much narrowed the circumference measuring only 2 cm No signs of atheroma were found The uterus and embryo corresponded to a pregnancy of eighteen weeks, the placenta and corpus luteum appearing normal

I have to thank Dr B A Young consultant physician to St Alfege's Hospital, Greenwich for the details of the case and for permission to report it

Dresden Germany R SCHEUER-KARPIN

MASS RADIOGRAPHY

SIR,—Dr Hoffstaedt's article of Dec 9 is based on a fundamental misconception—namely, that "one unit can manage 25,000–30,000 miniature films a year"

Most units find it possible to make about 50 000 examinations annually We are not surprised therefore, that the units to which he refers appear to be so expensive. Unfortunately in your leading article of the same issue Dr Hoffstaedt's experience has been applied to mass-radiography units as a whole Because a Durham carpenter bruises his thumb we see no reason why hammers should be withdrawn from the rest of the country

You state that mass radiography is expensive One of our units in south-east London has discovered 250 cases of active tuberculosis during a year, at a cost of £24 each. Surely early diagnosis is the most important facet of the whole tuberculosis problem and should therefore be the last item on which to economise You further claim that often a number of people are found to have tuberculosis, already cavitating, who a few months or weeks before gave a normal radiograph in a mass survey Is there statistical evidence to put mass radiography out of court on this point?

You suggest that mass radiography should be applied only to certain selected groups where a higher proportion of positives can be expected than in the general population. Of the groups you list school leavers have an exceptionally low proportion of active tuberculosis—0 15% of 500,000 examined. School staffs others in contact with children prospective employees, and women attending antenatal clinics will give no greater yield than others in equivalent age-groups in the population at large Those with a dust hazard chronic sick, suspects referred by doctors, and contacts though producing a higher yield, will do little more than whet the appetite of a voracious unit doing 50 000 examinations in a year For instance, there is a London chest-clinic area where 996 contacts were examined at the clinic in 1947, representing but two days' work for a mass radiography unit Much time may be wasted in organising surveys for small groups We believe that the main emphasis should be on volunteers from the general population

F D BEDDARD
F J H WALTERS
Medical directors mass X ray units South East and South West Metropolitan Regional Hospital Boards.

MEPHENESIN IN PSYCHIATRIC CONDITIONS

SIR,—Mephenesin ('Myanesin') was originally introduced as a muscle relaxing agent during anæsthesia, being administered intravenously for this purpose. Subsequently, it was found that it produced muscular relaxation in certain spastic and hyperkinetic disorders associated with a variety of neurological conditions, and that it was possible to obtain this effect by oral administration During the clinical investigation of the neurological properties, it became obvious that it also exerted an effect in the psychiatric sphere, the therapeutic response obtained in cases of anxiety and depression being very marked

Schlan and Unna[1] treated 63 patients suffering from anxiety states acute and chronic psychoses, alcoholism, and drug addiction The dosage of mephenesin was 0 5–1 5 g four times daily by mouth Patients suffering from anxiety obtained relief within one hour of administration and this persisted for not less than two hours Beneficial effects, particularly the abolition of gross tremor were also observed in cases of prolonged alcoholic intoxication In cases of addiction to morphine and heroin, mephenesin was found to alleviate withdrawal symptoms, such as nausea leg cramps, and vomiting, most successfully It frequently produced normal sleep in patients whose disturbed psychic function had been causing insomnia Henneman et al[2] believe that it acts by raising the threshold of internuncial neurones in the spinal cord and brain stem

It is with the object of making the valuable properties of mephenesin more widely recognised that the following cases are reported

CASE 1—A 47 year-old male dipsomaniac was given 'Myanesin Elixir (B D H) to relieve tremor Two weeks after he left the nursing home I was called suddenly to see him by a member of his family, the impression being that he was suffering from the effects of alcohol He had in fact taken an 8 oz. bottle of the elixir on each of three successive days: his speech was slurred his movements were awkward and clumsy and he was mentally retarded. He was almost incapable of standing and had to be supported when walking His reflexes pulse and blood pressure were not appreciably affected He subsequently found that in therapeutic doses mephenesin effectively relieved him of his craving for alcohol.

CASE 2—A 44-year-old woman who had attempted suicide suffered from intractable restlessness and insomnia Paraldehyde made her violently sick and had to be discontinued many other hypnotics were equally ineffectual 1 oz. of myanesin elixir was prescribed preceded by 'Tuinal' gr 3 thirty minutes earlier this combination produced refreshing sleep for ten hours

CASE 3—A 35 year-old man in receipt of a 20% disability pension for psychoneurosis, suffered from epileptic fits which did not respond to anticonvulsant or other drugs Myanesin elixir was prescribed in doses of 1 oz when the aura of tingling developed down the left side of the body merely in an attempt to relieve the intensity of the fits Since the first dose there has been no recurrence of fits now extending over a period of several months during which time he might have been expected to have had dozens

1 Schlan L S Unna K. R J Amer med Ass 1949 140 672
2 Henneman E Kaplan A Unna K. R. Fed Proc 1949 8 301

CASE 4 —A woman of 34, with a grossly unstable personality, was subject to hysterical outbursts of manic intensity She was instructed to take myanesin elixir (1 oz) when she or her husband felt that an attack was impending This has been completely effective She describes the effect of mephenesin as similar to mild intoxication she is "knocked out" for a couple of hours, after which her aggressive episode has passed Her entire personality has changed since her out bursts have been controlled She has become psychologically accessible, less inhibited, more objective in her outlook, and a happier person

CASE 5 —A man of 52, who had been invalided out of the Army on account of myocardial degeneration and hyper thyroidism, applied unsuccessfully for a pension Two specialists decided that there was no evidence of the dis abilities on account of which he had been discharged from the Forces, but when they identified an anxiety state he became very apprehensive Anxiety attacks, characterised by tremb ling, palpitation, giddiness, and fear of collapse, occurred almost daily, and he became unwilling to go out of doors except by car Myanesin elixir was prescribed, after sedatives had failed to effect any improvement, and the severity of his attacks was immediately reduced

I should like to express my thanks to the directors and staff of the British Drug Houses for their coöperation in this work

London W 1 ELLIS STUNGO

DOORMATS FOR OPERATING-THEATRES

SIR,—It has often struck me that the amount of contamination introduced into the operating theatre on the soles of nurses', surgeons', visitors', and porters' feet must be quite considerable, and I venture to suggest that a certain amount of antiseptic cleansing of the soles of shoes and wheels of trolleys could be achieved if a sunken, floor level, padded mat, soaked in a suitable antiseptic, could be placed at the common entrance to an operating theatre suite

Anyone passing over this mat would automatically coat the soles of his shoes with a thin layer of antiseptic, in the same way as "foot and mouth" traps are situated at certain frontier posts in Europe

Buckhurst Hill Essex BERNARD KAPLAN

HEPATIC ABSCESS ASSOCIATED WITH SCHISTOSOMIASIS

SIR,—I have only lately had the opportunity of reading the article on this subject by Dr Graham and Mr Orr [1]

Infestation of the liver by schistosomes has been recognised for a long time In 1933 Bourguignon, in Elisabethville, showed me some beautiful photomicro graphs of adult worms and eggs in the liver

The population around this hospital shows an infestation rate of 15% with *Schistosoma hæmatobium* This is after a single examination, repeat examinations would give a considerably higher rate—possibly double

Palpable livers are common, both in small children and in adults In almost all children with palpable livers schistosome eggs can be found by repeated urinary examinations In adults enlargement of the liver is commonly accompanied by enlargement of the spleen and ascites These cases usually terminate fatally in a few years or less Sometimes the liver has become shrunken and cirrhotic before death, in such cases schistosome eggs can often *not* be found in the urine, but cystoscopy often reveals extensive damage of the bladder wall I conclude that either the worms have died or that the extensive cicatrisation prevents the escape of the eggs

On the other hand, liver abscess from any cause is rare here I have seen only 2 instances in 120 autopsies and in a large number of explorations either by operation or puncture The suggestion by Graham and Orr that in their case the abscess was caused by auto infection of a necrotic area appears to me very probable They are to be congratulated on giving us a timely reminder of schistosomiasis as a possible cause of hepatomegaly and liver abscess

Chibambo Mission Hospital
Elisabethville
Belgian Congo PATRICK K DIXON

1 Graham I G Orr I I *Lancet* 1950 I 714

STRIÆ CUTIS DISTENSÆ

SIR,—May I summarise some of the points arising out of this controversy ?

(1) Striæ atrophicæ (I use this term because striæ may occur without any previous stretching of the skin) are an expression of damage to the skin

(2) Sixteen years ago I thought that purple striæ atrophicæ were characteristic of Cushing's syndrome due to basophil adenoma [1] I abandoned that view because they occur with adrenocortical tumours causing Cushing's syndrome, and disappear after removal of the tumour (Selye,[2] p 170) Furthermore, there are typical cases of Cushing s syndrome with no striæ, in spite of rapid increase in weight Spence demon strated an example to the endocrine section of the Royal Society of Medicine on Nov 22 A woman of 47, with a mixed Cushing s and adrenogenital syndrome due to adrenal cortical carcinoma, had a petechial eruption over her upper chest, neck, and arms, and yet had no striæ atrophicæ Her excretion of urinary 17 ketosteroids was 42 5 mg per 24 hours Only 4 weeks ago I saw a case of the pituitary type without any striæ in spite of an increase of a stone in weight within 4–6 weeks at the beginning of the illness

(3) Patients may develop purple striæ in association with pleural effusion pulmonary tuberculosis, pneumonia, asthma dysentery or tonsillitis, and even without any signs of illness [3–8] (e g , three cases reported by Hurford and Snell [3] and one by Parkes Weber [5]) In Parkes Weber's patient they were present from 1934 to 1942, although the girl remained in good health (see Romer [7])

(4) Cases of chronic malnutrition sometimes develop such striæ [9 10]

(5) Overdosage with Cortisone or A C T H may produce striæ atrophicæ as well as hyperpigmentation, acneform eruptions, hirsutism, rounded (moon) face, delayed wound healing, and flattening of keloid scars [11] In the New York conference on A C T H , Sprague [12] stated that the hyper pigmentation resembles that of Addison's disease Behrman and Goodman [11] accept Albright's view that the striæ are caused by thinning of the skin due to protein depletion Selye [10] confirms that the same hyperpigmentation may be found in severe adrenal cortical deficiency, he says, "if systemic overdosage with cortisone may render the rat skin extremely atrophic and transparent, so do hypophysectomy and adrenalectomy", finally, he finds it 'suggestive to assume some interrelation between the characteristic striæ of Cushing's disease and the cutaneous atrophy which occurs in debilitated individuals and after overdosage with cortisone or A C T H"

(6) Purpura may occur as a result of damage to the capillary endothelium with or without concomitant altera tions in one or more of the factors concerned with blood coagulation It may occur in infectious diseases, after drugs in cachectic states in Cushing's syndrome, after overdosage with cortisone, or from mechanical causes (e g , in pertussis)

(7) Of hyperpigmentation Selye writes, on p 170 of his textbook [2] "sometimes there is a melanoderma (in hyper corticoidism) reminiscent of Addison s disease This may be either generalised or patchy, it is not due to secondary destruction of the adrenals since it can appear even in patient in whom only one adrenal is affected It is also note worthy, though unexplained that most animal species

1 Medvei V C Werimer P *Med Klin* 1934 30 992
2 Selye H Textbook of Endocrinology Montreal 1948
3 Hurford J V Snell W F *Tubercle* 1943, 24 16
4 Medvei V C *Lancet* 1950 I 1174
5 Weber Parkes F *Lancet* 1935 II 885 Rare Diseases and some Debatable Subjects London 1947
6 Crofts N F Macrae Gibson N K *Lancet* Nov 18 1950 p 8[illegible]
7 Romer C *Ibid* Dec 16 1950, p 82[illegible]
8 Kok D Almero *Ibid* p 826
9 Macleod J M H Cited by Hurford and Snell
10 Selye H Physiology and Pathology of Exposure to Stre Montreal 1950 p 728
11 Behrman H T Goodman J J *J Amer med Ass* 1950 144 218
12 Sprague R G Proceedings of 1st Clinical A C T H Conference New York 1950 p 384

unlike man, do not develop cutaneous pigmentation under the influence of hypocorticoidism although pigment formation in animals is dependent on the adrenal cortex and can be influenced by corticoids '

(8) The urinary corticoids are usually much increased in Cushing's syndrome and after overdosage with cortisone or A.C.T.H.,[13 14] but they appear to be decreased in chronic malnutrition and in Simmonds's disease (Selye[10] p 223) Besides the 'normal values of urinary corticosteroids vary from 0·5–1 5 mg[15] and 0 025–0 085 mg per 24 hours[16] to 0·5–5 0 mg per 24 hours (neutral fraction) and 0·3–3 3 mg per 24 hours (water soluble fraction)[17]

What does all this mean? Surely that the skin as a target organ responds to a variety of stimuli In Hindus, melanoderma (even of the mucous membranes) is racial (genetic), in Addison's disease the skin often responds in man and becomes pigmented, the skin of the laboratory animal does not do so

Patients with localised myxœdema of the skin over the tibia do not seem to have a general deficiency of thyroid hormone, for their remaining skin appears normal In partial acromegaly only a small fraction of the skeletal system may be affected there does not appear to be a general excess of anterior lobe hormone particularly of growth hormone

Bauer[18] has been teaching for many years the "principle of triple safeguard"—that many traits and functions of the organism are dependent on and regulated by the proper cooperation of (*a*) the particular organ ("effector organ," *Erfolgsorgan*), now called "target organ", (*b*) the endocrine system, and (c) the nervous system He contends that many traits and functions should be regarded as complex biological mechanisms They cannot be understood merely by considering single parts of the highly integrated system of individual constitution

I do not think, therefore, that we are justified in assuming that striæ atrophicæ are *always* an indication of *excess* of adrenal cortical hormone Selye puts it quite clearly in his book on stress[10] (p 783) "Diseases of adaptation do not necessarily result from an absolute deficiency or excess of corticoids"

I shall end with a quotation from Bauer[18] (p 54) "It is possible today to produce artificial acromegaly and gigantism in dogs by prolonged administration of pituitary growth-promoting hormone, and it is possible to produce dwarfism by removal of the pituitary or thyroid. It is impossible, however, to transform one canine race into another by means of endocrine control An artificially produced giant dog is neither a St Bernard nor a Great Dane"

London S W.3 V C MEDVEI

CHANGES IN THE CENTRAL NERVOUS SYSTEM DUE TO ELECTROCUTION

SIR,—It is perhaps rather late to comment on an article published some sixteen years ago, but the hypothesis put forward then has found its way into at least one medical textbook.

Dr Blake Pritchard,[19] writing on changes in the central nervous system due to electrocution, suggested that electrostatic forces play an important part in causing lesions in the central nervous system, and supporting this hypothesis by some calculations based on one impossible assumption—namely, that a charge of 0·2 coulombs can accumulate (if only for a short while) on the human body This charge concentrated on a body of the size of man would correspond to a potential of roughly 10,000 million volts In actual fact this is impossible because the surrounding air would have broken down long before such a charge was accumulated and the potential reached The conclusion therefore that a force of 4×10^{13} dynes or some 40,000 tons, act on the body is not tenable

Later in the article the kinetic energy is equated with this force which is dimensionally wrong

Finally the conclusion that a surface charge corresponding to 'half an atmosphere pressure' leads to a decompression wave is untenable The highest possible electrostatic surface pressure in air is about 400 dynes per sq cm, corresponding to a break down voltage gradient of 30,000 volts per cm This pressure is very small indeed—equivalent to the change of atmospheric pressure when jumping from a table to the ground (3 ft) It cannot possibly lead to lesions inside the body

One of the main reasons for writing this letter is to draw the attention of the medical profession to a useful field of joint research with physicists and possibly engineers

Department of Electrical Engineering
University of Cape Town H D EINHORN

9. Sprague R. G et al *Arch intern Med* 1950 85 199
10. Wilkins L Lewis R A Klein R Rosenberg E. *Bull Johns Hopk Hosp* 1950 86 249
11. Shipley R A. Dorfman R. I Buchwald E Ross E. *J clin Invest* 1946 25 6-3
12. Vennings E H Browne J S L *Ibid* 1947 27 19
13. Robinson A Unpublished
14. Bauer J *Constitution and Disease* New York 1942 p 51
15. Pritchard E A B *Lancet* 1934 1 1163

CENTRE FOR TUBERCULOUS STUDENTS

SIR,—Though such centres are well known abroad and though the need for such a centre has recently received recognition in the B.M.A Report on Tuberculosis, there exists in this country no particular institution in which students with tuberculosis can receive medical treatment while continuing their studies The British Coördinating Committee for Student Health * is organising a trust fund with the primary object of establishing such a centre, and the committee would, through the courtesy of your columns, like to invite donations large and small to this fund

It is quite impossible at the present moment to set up a full scale sanatorium treating students in all stages of tuberculosis It is intended that the centre now proposed should cater for students already sufficiently recovered to be able to take advantage of the educational facilities that it is part of the scheme to provide It is at this stage that occupational therapy—and for a student his education is occupational therapy—is of most help, it is at this stage that the present inability to continue his studies is most disheartening to the student and, most conveniently, it is at this stage that the demand for skilled nursing is least Even from the point of view of the treatment of tuberculosis in the non student population, the centre is likely to prove an asset since the transfer of students to the centre from sanatoria would lead to the earlier freeing of sanatorium beds

The arguments for setting up a centre especially for students apply not exclusively to those usually understood by that term and for this reason it is intended to make the centre available to senior as well as junior members of universities and other institutes of higher education, to research students as well as undergraduates to university and college teachers as well as those in statu pupillari

All donations to the fund should be sent to one of us, c/o British Student Tuberculosis Fund Tavistock House South, Tavistock Square, London, W C 1 Cheques should be made payable to the British Student Tuberculosis Fund

F R G HEAF
C R MORRIS
ALAN F ROOK.

* Representing British Medical Students Association International Student Service National Union of Students Scottish Union of Students British Tuberculosis Association Joint Tuberculosis Council National Association for the Prevention of Tuberculosis tuberculosis group committee of the British Medical Association Association of University Teachers Two University Medical Officers Association of Principals of Technical Institutions and Association of Teachers in Colleges and Departments of Education

REGISTRARS

SIR,—In all that I have read about the registrar problem there has been no mention of the junior hospital medical officer Surely the original fault lay with the hospitals which competed against each other for junior staff by advertising all positions as registrar grades This was inevitable when a house officer post remained empty until it was re christened "junior registrar"

The present problems might be solved by limiting the registrar appointments to those hospitals which could offer their staff (or selected members of it) either formal training or adequate free time for study All other posts would be called house officer or J.H M O—the latter not being limited to a fixed period of years The man who hoped to become a consultant could then trade his security for greater opportunities of training If he failed at one stage or another he could remain in his specialty (although probably at a different hospital) as a J H.M O but would have lost his privileged position If there were a free interchange between the parallel hierarchies, there would be no feeling that the man who left the registrar stream could never become a consultant (although his chances would be less), that is the selection would not necessarily be made at an early age

Maudsley Hospital London S E 5 JOHN RICH

OCCUPATIONAL THERAPY

SIR,—In rehabilitation much has been said about the importance of returning the individual to a "work environment" In the case of a machine operator, this implies an industrial workshop where he can be engaged on some machine even though his efforts produce a quantity of material of insignificant economic value It is in this direction that it seems a creative social function of rehabilitation may be lost

The value of occupational therapy in rehabilitation is twofold first, it stimulates interest, and secondly, it restores function and skill An individual recovering from injury or sickness may on discharge from hospital be unfit to proceed at once to rehabilitation in the form of learning a new trade or recovering lost skill in his old occupation In this condition, introduction to a well equipped occupational therapy department staffed by personnel with the right outlook may be a step of great importance There he will see others with a great range of handicap working at one of twenty or thirty different crafts, involving the use of a variety of machine tools According to the estimate made of his mental and physical condition, the occupational therapist, guided by physician or surgeon, may allow him to choose one or perhaps two jobs—one if that serves to stimulate interest and restore function, or two where one particular job has a major attraction of interest and the other restores function Often, the interest aroused may be such that without noticing it the patient recovers a greater degree of general mobility than he had thought possible, or, in some cases, even wished for

Many patients coming for rehabilitation have passed a somewhat drab and unimaginative life at the work bench or in a circumscribed factory environment To be returned as soon as possible to an industrial workshop may be to lose a great opportunity, almost as though the man was to be returned to blinkers and harness efficiently to draw the cart or tread the corn In an occupational workshop he will see for the first time the range and number of small crafts to which his hand may be turned for sheer pleasure and joy in creation perhaps with the added gratification of gifts for friends or furnishing for his home His vision is enlarged, and when his recovery is complete or he is fit to proceed for training in a permanent occupation he has learn craft which can provide a hobby for the rest of He has been introduced to a socially creative The factory bench will soon be reached again, bu time should never again be lacking in pleasing tion, and his work at the factory may thus pro irksome Whether this is so depends to a great on the personality of the occupational therapist power to instil enthusiasm at the beginning

It seems that here is a thread in a pattern might be for industrial workers compensation f routine and monotonous mass production work S that at all schools there were well equipped a crafts departments, and that in every community were equally well-equipped centres under the experts—centres where materials and tools obtained and the work done in an environme with the space lacking in the modern small ho lodgings Here skills might be learned or con from school. Mother, father, and children collaborate or follow their individual lines The or sick during convalescence might learn or develop in the occupational workshop and continue i community workshop

Stimulated on a national basis with strong comm support, these centres might go far to restorn sense of creative activity of the old craftsman assuage the unrest produced by repetitive work routine jobs or semi automatic machines—a fac undoubted importance in producing industrial ne These centres would provide an alternative to the the dogs, or the cinemas so often visited from boredom The immense difficulties in the way of ac ing a development of this sort are realised, but pe now that rehabilitation centres and school worksho being steadily increased in number the idea may study and more consideration be given to the cre social function of occupational therapy to offset w an industrial atmosphere

Farnham Royal Bucks M E M HERFO

STETHOSCOPES

SIR,—There seem, curiously, to be very few clin able to give a simple and coherent account of the stethoscope I have yet to see in any textbo discussion of the relative merits of the diaphragm bell types—although their makers must be well of the basic principles of the instrument

It is well known that low frequency notes, su mitral diastolic rumbles, are best heard with the open bell endpiece, and that harsher high pitched s are clearer when a diaphragm endpiece is used, or a bell is pressed hard on the skin The acoustic co tion system in the case of the chest consists first o air space separating viscus and thoracic wall, th "diaphragm" made up of layers of muscles and and finally the long air column terminating in the piece The situation might be visualised as so listening to sounds coming from the other side room, with a thick heavy rug hung across the c Through such a rug the slow air motion accompa a low frequency noise would be clearly heard, partic since the high frequencies would be largely filtered the lax "diaphragm" If the soft rug could be pressed, it would become harder and thinner, pro less resilience—hence providing less resistance to passage of high frequency sounds and more to frequency sounds A stretched rug would behave in same way

It appears that the diaphragm endpiece of a stetho accentuates the high frequency sounds not by property inherent in the diaphragm, but rather by va of the compression and slight stretching of the

wall against the whole area of the diaphragm ase of the bell stethoscope, the higher frequency obtained by pressure is presumably due to ng of the soft tissues per se

ay conclude that unless the diaphragm endpiece used merely to hear something from a chest wall ed in such a way as to make it impossible for a ie flat, it should always be pressed down firmly se its object will be defeated

regard to the flexible tubes of a stethoscope, eems to be no virtue in a very large internal r However, there are two reasons why the hould have thick walls First, the instrument robust, and second, the thicker and less resilient l, the less extraneous noise will be heard Apart e room noise heard from ill fitting earpieces, most omes in via the fairly extensive "membrane" lexible tubes There is thus a distinct advantage ng the wall as thick and stiff as possible, and it is reason that tough plastic tubes may have a good r consideration

ould be interesting to know if any of your can make any addition to, or comment on, this

sity College Hospital
ondon W C 1 C J DICKINSON

HOID FEVER IN A GENERAL HOSPITAL

-In his letter of Dec 2, Dr Grant takes two to task for treating a case of typhoid fever in general hospital In your issue of Dec 16, hael Curtin, registrar in the hospital for infectious of which Dr Grant is medical superintendent, s a case of subacute bacterial endocarditis treated r five months Is it partly because the beds in n hospitals are being used for non-contagious ons that the failure to find accommodation lmonary tuberculosis has become a 'national l"

stle upon Tyne H A DEWAR

TOWARDS SAFER MILK

—Your annotation of Oct 7, describing the area tion scheme for dealing with tuberculosis in cattle,

mmediate slaughter of all reactors is not feasible, se it would cause a disastrous fall in milk-supplies erious disturbance of farm economy the cow plays portant part in maintaining soil fertility and some cement stock must be bred from the tuberculin re."

complacent condonation of the use of reactor cows id milk production rests on two false premises armers are really worried about the flooding of id milk market, and it is common knowledge ich milk from attested herds goes to the manu- g market The fear of a milk famine is therefore as and even if such a fear was justified I am mothers would not welcome a return to rationing subject their children to the risk of tubercu ndly, it is nonsense to fear the lowering of lity through the lack of cowdung Many farms estock at all, and a simple alteration of soil ment would obviate any loss of fertility due to sence of dung

Government s proposal to compensate farmers for laughter of reactors is a scandal, since the best rs have already cleaned up their herds and only uggards or the unscrupulous continue the production lk from reactors Reactor cows still form the back of the business of a type of dealer and farmer who d never be allowed to handle human food (except eir own use) I have personal knowledge of such a man who keeps a tuberculin-tested cow for his own use and sells milk from a cheap herd of reactors

If every reactor cow was suitably branded, farmers would not dare to keep them openly, and the waiting-lists for sanatorium treatment would be lessened by removal of all cases of bovine tuberculosis

Llandinam Mont HARDY NAYLOR.

*** We have long urged that all except the highest grade of designated milk should be heat treated before distribution Though, on the present policy, eradication of tuberculosis in cattle will not be achieved for something like fifteen years, this is a shorter time than other countries have taken over the task -Payment of compensation to farmers who would otherwise be deprived of their livelihood seems to us essential —ED L

TROPHIC AND TROPIC

SIR,—In 'thyrotropic" and kindred words the adjective τροπικὸς forming the suffix is derived from the passive voice of the verb τρέπειν, which has the two meanings of to "turn oneself towards" and to "betake oneself to"

τοῖ δῆθ ὁ τλήμων τρέψομα, τίνος ξενων
δόμους ἔσειμι τῆδ' ἐπ' αἰτία φυγών,

Eur Hipp.

Where shall I turn me? Think To what friend's door
Betake me banished on a charge so sore?

Gilbert Murray

The heliotrope turns itself towards the sun the thyrotropic hormone betakes itself to the gland For the use compare the well known epithet of Odysseus πολύτροπος (polutropos), 'versatile", or the name of the Fate "Ατροπος (whence atropine), "Inexorable' To say that a hormone betakes itself anywhere is not precisely accurate, but it is an allowable figure of speech in fact it is a trope

Professor Burn's substitution (Dec 9) of trophic for tropic, from τρέφειν to rear, will hardly do, for the notion of nourishment is implied, whereas a hormone stimulates growth without contributing nourishment An adjective denoting "furthering growth" is βλαστικός (blastikos) "Thyroblastic" proclaims in one word that "it exerts a most important influence on the development of the thyroid gland"

Orpington Kent H ST H VERTUE

SIR,—May I venture to question Professor Burn s assertions on the meaning of the suffix "tropic"

The verb τρεπειν, from which τρόπος is derived is a transitive verb (Latin vertere), not intransitive as implied by Professor Burn Admittedly, used in the middle voice it carries the meaning which he attributes to it, but basically it means 'to turn (something), guide, or direct" In the spirit of free translation so common in scientific terms, 'adrenotropic" and 'thyrotropic' can quite legitimately be interpreted as 'guiding or directing the adrenal or thyroid," a more accurate description of the action of these hormones than "nourishing," which function they obviously do not perform

Etymologically, 'geotropic" and 'heliotropic can be regarded as implying that the earth and sun respectively are responsible for the directing or are themselves being directed. Although the scientists may not mean this, it would be folly for us to base the application of this and other suffixes of classical origin upon existing inaccurate English usage

Sheffield. H H PILLING

Obituary

LEONARD GREGORY PARSONS

KT, MD LOND, FRCP, FRCOG, FFR, FRS

Sir Leonard Parsons, emeritus professor of child health in the University of Birmingham, was a prophet who was not without honour in his own country But his name was almost as well known in Canada and the United States as it was here, and pædiatricians all over the world will share in our loss

From his earliest years he belonged to the Midlands, for he was born at Kidderminster and educated at King Edward's Grammar School, Aston, and at Birmingham University After qualifying in 1903 he held resident posts at the Queen's Hospital in Birmingham and spent some years in general practice before taking a house-appointment at the Hospital for Sick Children, Great Ormond Street In 1909 he took the MRCP, and in the following year he was elected to the staff of the Birmingham Children's Hospital as physician to outpatients

The hospital then had only 62 beds, whereas today there are over 300 Forty years ago the attention paid to the subject of diseases of infants and children was negligible, and the hospital was not associated with the medical school Parsons set himself to promote the subject to the importance it warranted Within five years his industry and enthusiasm had met its first reward and he was appointed to the specially established post of lecturer in diseases of children Under his wise and thoughtful guidance pædiatrics began to figure more prominently in the training of students

Stoneman

During the 1914–18 war Parsons served with the R A M C in Salonika For part of the time he was attached to the Serbian army and in 1917 he received the Order of St Sava Soon after his return to civilian practice, he persuaded the medical faculty to approve the Children's Hospital for student instruction, and clinical classes were arranged In 1929 he had convinced the university authorities of the importance of his subject, and when it was elevated to professorial status he was appointed the first professor of diseases of children in the university During these and succeeding years, not only did he run a busy and exacting private practice but he continued to advance pædiatrics by teaching, research, and writing His industry and enthusiasm were indefatigable

The next major development in the university department was in 1934, when clinical clerking at the Children's Hospital was made compulsory for all students, and in 1943 Birmingham was one of the first universities to make pædiatrics a special and distinct part of the final examination Meanwhile increasing knowledge of the diseases of children led Parsons to appreciate that prevention was as important as cure but was not receiving the recognition it warranted He saw clearly that the gap between these two sides must be bridged, and in 1930 he inaugurated discussions with representatives of Birmingham University, the Children's Hospital, and Birmingham city council The war interrupted progress, but soon afterwards negotiations were resumed and in 1945 an institute of child health was set up in Birmingham This institute fulfilled Parsons's ambitions and ideals and fused into one whole all aspects of child health The scheme he evolved was the first complete one in this country, and up to the time of his death he continued to be an active member of the council

Side by side with the university department of pædiatrics, and again under Parsons's guidance, the Children's Hospital grew steadily in size, importance, and prestige When the specially designed infants division was started over fifteen years ago, he went to infinite pains in the study of the architectural design and gave in[illegible] help in rousing public opinion and raising funds [illegible] erection The building was finished early in the [illegible] could not be fully used until 1944 In October [illegible] a special dedication ceremony was held, when the b[illegible] was named the Leonard Parsons block It wi[illegible] remain a memorial to his work for the hospital [illegible] the children of the Midlands A London colleagu[illegible] of the hospital under Parsons as a friendly place [illegible] the visiting doctor was made to feel one of the c[illegible] keen workers and brought away something of th[illegible] and enthusiasm he found there, for Parsons had f[illegible] and developed a team spirit which was exempl[illegible] the fine series of articles on the anæmias in ch[illegible] published under many names in the *Archives of D[illegible] in Childhood* (1933–35) He was a man we all t[illegible] a man of integrity and wisdom, who gave of his b[illegible] called the best out of others" His editorship i[illegible] with Seymour Barling, of *Diseases of Infan[illegible] Childhood* was another example of his talent for [illegible] a team

Parsons was also an efficient administrator [illegible] many years he represent[illegible] university on the General [illegible] Council, and from 1941 h[illegible] dean of the medical faculty [illegible] the late war he was also a r[illegible] hospital medical officer f[illegible] Ministry of Health From [illegible] 1945 he was president of the [illegible] Pædiatric Association, of wh[illegible] was a foundation member

But there was also Parso[illegible] research-worker The many [illegible] lectures which he was cho[illegible] deliver were always somethin[illegible] than formal reviews, for the[illegible] warmed by his own knowled[illegible] first-hand experience, and i[illegible] striking surveys he linked th[illegible] done in his own hospital wit[illegible] done elsewhere From the[illegible] when he gave his Goulstonian l[illegible] in 1924, on the Wasting Disor[illegible] Early Infancy, till his Wit[illegible] lectures in 1947, on Nutritio[illegible] Nutritional Diseases, the def[illegible] diseases remained one of his g[illegible] interests Their elusiveness at[illegible] him, for, as he once pointed out, [illegible] nutrition is quite easily recognised by Members of [illegible] ment and publicists, but clinicians find it diffic[illegible] diagnose" Stimulated by the work of his colle[illegible] W N Haworth, E L Hurst, and J C Drum[illegible] on the synthesis of ascorbic acid, it was natural t[illegible] should make a careful study of the clinical applicat[illegible] vitamin C, especially in relation to scurvy Another [illegible] chosen subjects was diseases of the blood, and [illegible] Schorstein lecture at the London Hospital in 1938 he[illegible] on the Hæmolytic Anæmias of Childhood As ea[illegible] 1930 investigations into these anæmias were on f[illegible] Birmingham, and the school played a large p[illegible] establishing that erythroblastosis is a hæmolytic d[illegible] His interest in every new idea was instant, and [illegible] Blair-Bell lecture to the Royal College of Obstetr[illegible] and Gynæcologists in 1948 he discussed the then [illegible] theory of the influence of maternal rubella on cong[illegible] defects But he steadily refused to lose sight of the [illegible] for the trees, and in his Charles West lecture t[illegible] Royal College of Physicians in 1943 he once more in[illegible] that pædiatrics is not a specialty, but general med[illegible] applied to a special period of life He also lectured [illegible] abroad In 1931 he gave the Rachford lecture a[illegible] University of Cincinnati, and in 1941 the Black[illegible] lecture to the Canadian Medical Association In [illegible] he was awarded the Moxon medal, and he was kni[illegible] in 1946 He was already a fellow of the Royal Co[illegible] of Physicians, of the Royal College of Obstetricians [illegible] Gynæcologists, and of the Faculty of Radiologists [illegible] he was elected to the fellowship of the Royal Socie[illegible] 1948

On St Luke's day this year he was the Harveian or[illegible] of the Royal College of Physicians, he was one of

ciety of the Air, whose learned and enter-
dinner conversation was broadcast last
a few weeks ago he gave the Harben
e Royal Institute of Public Health and
died at his home on Dec 17, at the age of
st of a still busy life

es "Those of us who knew Leonard Parsons
ether on committees, in the wards of his
tal, on examiners' panels, or in his own
ppreciate his gentle, kindly nature, his
vide sympathies, and his great love for
home life was supremely happy and it
he obtained the inspiration and strength
him so much in his work His influence
hed many points, and perhaps the future
t his most important work has been the
infant and child welfare work with clinical
d his facility for striking the right balance
ention and cure of disease in childhood He
rather shy, Christian gentleman who will
and remembered by friends all over the
ere will be many parents in the Midlands
his name"

ars ago," writes A P T, "walking from our
nard Parsons told me that he had decided
much time as he could to the study of
dren When I asked him why, he said there
sons. First, that he liked children, and,
e believed the problems of pædiatrics were
e the most profitable to study while bio
l clinical pathology were in their infancy,
were relatively simple in comparison with
s—and, he added with a laugh, he got on
mple things With infinite patience and
he built up the research departments at
Hospital, and the record of his achieve-
ss not only of the shrewdness of his judg-
of that rare power of sustained interest
h so many projects fail But he never
row specialist, he had a sense of the unity
and knowledge that was wide as well as
as not a quick or agile mind, but it was a
, and he had the supreme gift of defining
It was this and his integrity which brought
s an administrator in his later years, men
im wrong but they could not justly question
His example inspired the school he served
so well, and honours did not spoil him, to
as a humble seeker after truth and always
search He had learnt the great lesson

quiet homes and first beginning
to the undiscovered ends
s nothing worth the wear of winning
laughter and the love of friends

s reward"

Leonard married Miss Ethel Mantle She
with a daughter and a son, Dr C G Parsons,
llowed his father as physician to the
Children's Hospital

HENRY MacCORMAC

C B.E, M.D EDIN., F R C P

y MacCormac, consulting physician in
he skin to Middlesex Hospital, died at his
don on Dec. 12, at the age of 71
f an old Belfast medical family His grand-
ier Henry MacCormac, was said to know
and was one of the first advocates of the
tment of consumption, which he held was
lered by "pre breathed air" His uncle,
MacCormac, who was present at the battle
ctised as a surgeon in London and was five
nt of the English college
ger Henry MacCormac graduated M.B at
ty of Edinburgh in 1903, and after post-
udy in Paris was appointed assistant
t at Middlesex Hospital in London
ecame medical registrar, and for a time
as an assistant in the cancer research
Here his growing interest in dermatology led him to study precancerous conditions of the skin, and in the reports of the department will be found his studies on the relationship of rodent ulcer with squamous carcinoma of the skin In 1911 he was elected to the staff of the hospital as assistant physician, and he also became a member of the staffs of the Infants' Hospital, Vincent Square, the Seamen's Hospital, Greenwich, and St John's Hospital for Diseases of the Skin

Elliott & Fry

During the 1914–18 war he was consulting dermatologist to the British Expeditionary Force in France Of this period H W B writes "He was fired by an intense patriotism and a passionate determination to convince the Army authorities of the enormous wastage of manpower from skin diseases, much of which, as we know now, could have been prevented by adequate prophylaxis and efficient treatment In the end, aided by others, he succeeded If, perhaps, he underestimated the importance of pyogenic infection secondary to pediculosis corporis, he conducted with Dr W D D Small an intensive campaign against scabies He may be said to have made the Army scabies-conscious, and he took infinite pains to impress on medical officers the important diagnostic features of the disease and its complications, he described clearly the atypical varieties that might be encountered It was, perhaps an indication of his respect for tradition that the routine method of treatment he so strongly advocated and instituted was inunction with sulphur ointment twice daily for three days He was, I think, the first to draw attention to the prevalence and seriousness of the miscalled seborrhœic' dermatitis, which was so important a cause of disability among our troops in France This condition was then usually diagnosed as impetigo and treated as such—with disastrous results, because one feature of these cases was their intolerance of banal antiseptic applications, such as mercurials and sulphur MacCormac taught me that calamine liniment was probably the best local application, at any rate during the acute phase of the eruption He rightly pointed out that what I later termed the 'status seborrhœicus' aggravated the problem of scabies, partly because it favoured secondary pyogenic infection and infective eczematoid dermatitis, and partly because the patients were often in varying degree intolerant of sulphur ointment"

For his war services MacCormac was twice mentioned in despatches, appointed C.B E in 1919, and awarded the médaille de l'assistance publique In 1917 he had been elected F.R C.P, and in 1920 he became head of the skin department at Middlesex Hospital. In 1933 he was president of the dermatological section of the Royal Society of Medicine, and he also served a term of office as president of the British Association of Dermatology and Syphilology

With his powers of observation and erudition he could, had he wished, have devoted himself to the more academic aspect of his subject and to research, but, although he made important contributions to literature, he preferred to concentrate upon dermatology as it affects the public welfare He continued his campaign against scabies gave a broadcast, which was characteristic in its clarity and simplicity, and with considerable difficulty had an excellent film made and produced to illustrate the essential points in the ætiology and prevention of the disease Later he interested himself in industrial dermatitis, and in his appointment as specialist medical referee his exact legal knowledge, his logical outlook, and his passion for justice made his opinions invaluable It is

related that "he would drive down to some outlandish factory to inspect the actual environment and conditions, in order to be perfectly just in his judgment on industrial dermatitis cases" For such expeditions he received no additional remuneration Recently, in spite of failing health, he succeeded—again with great difficulty—in launching a film on industrial dermatitis, which was admirably devised and produced Outside his professional and public activities, he had the cultured man's love and respect for history and tradition, and he delighted to revive interest in great figures of the past He wrote a memorable account of Robert Willan, and was responsible more than anyone for obtaining greater recognition of his pioneer services to dermatology

"Far more than most" H W B continues, "MacCormac was influenced by a sense of public duty, which accounted for his almost fanatical zeal during the first world war and afterwards as a civilian He strove, as others have done less successfully to impress both the medical profession and the laity with the importance of certain common dermatoses in the lives and activities of the community He was a man of impeccable—one might well say quixotic—personal and professional integrity I have known him sarcastic and sometimes bitter when he met with frustration, injustice, or indifference, but he was incapable of meanness, unkindness, or selfishness. Serious to a degree when what he thought was right was impeded or neglected he had an entrancing lighter side to his character I have never had a more delightful companion His sense of humour was of the more delicate, less obvious, kind, and he had—which is much rarer—a puckish appreciation of the comic, so that one of his treasured memories was that of Pelissier's Folies' He was a very good mimic, and his mimicry revealed his knowledge of the racial or social mannerisms and foibles of his victims As a host he was generous without ostentation, and on more formal occasions one could rely upon his detecting a humorous situation if there were one His high courage, and his humour, remained undimmed either by physical suffering or by the disappointment he felt at being unable to continue his work"

Lord Moran writes "Henry MacCormac was Ulster to the bone, and he had the qualities of good sense, forthrightness, and integrity, which we have come to associate with the North of Ireland, qualities softened in him by the graces of an old tradition For his forebears had won distinction in medicine before Jane Austen began to write—perhaps even in this democratic age that is no disadvantage—and his grave and gentle courtesy with humble folk came from a day before men congregated in great towns, so altering life He was a simple soul, unconscious of his worth, and when a signed copy of the *Gathering Storm* was sent to him, he treasured it and kept it always in his room, he was a man of strong loyalties, though his feelings seldom came to the surface Men liked him for the reasons known to men, and long ago cries of 'Henry, Henry' would greet his appearance at the Savile Club, before he was taken off to the bridge room In the branch of medicine which he practised he was a master, striving always to understand what was happening beneath the surface, for he was not a man to be content with labels, and in the business of the world his opinion was valued by the Royal College of Physicians, of which he had been a councillor and Lumleian lecturer"

In 1931 Dr MacCormac married Marion, daughter of Mr B C Broomhall, F R C S, of Tai Yuan Mission Hospital, China She survives him with one son

SYDNEY WATSON SMITH

M D EDIN, F R C P, F R C P E

Dr S Watson Smith, a past president of the British Medical Association, died on Dec 15 He studied medicine at St Andrews before going to Edinburgh, where he qualified in 1903 Despite delicate health he insisted on giving up his Dundee practice during the 1914–18 war to serve with the R A M C On demobilisation he settled in Bournemouth where from 1924 he restricted himself to consultant practice He was chosen to preside over the B M A when it met there in 1934 The editor of the *Book of Bournemouth*, he spoke and wrote sensibly on climatology, and in 1936 and 1937 he wrote constructively on the lessons to be learnt from the Bournemouth typhoid epidemic He was the chronicler of the B M A world tour which he led to Australia in 1935

Public Health

Poliomyelitis

In England and Wales notifications of poliomyel during the week ended Dec 16 were paralytic 82 (non paralytic 25 (31), total 107 (104) The figures the previous week, compared with which there wa total decrease of 3, are in parentheses

Pest Destruction by Fog

The insecticidal fog applicator known as 'Tifa' 1 been developed from the fog generators used in the war The makers claim that this apparatus, opera by one man, can fill 15,000 cubic feet of room sp with fog in a minute, or blanket 30 acres of gro in an hour given favourable atmospheric conditi The machine illustrated, mounted on a Jeep, was in Sardinia during the malaria eradication campaign 1947, it is shown fogging the cathedral church Bon Aria, Cagliari Various petroleum solvents m satisfactory fogging fluids, and to these may be ad insecticides such as D D T., B H C, or pyrethrum, droplet size of the fog can be adjusted between 0 and 200 μ The power is supplied by a 6 h p petrol engine, which drives a blower and pumps, and machine will disperse 10½–53 gallons of insecticide hour, according to the particle size adopted The

Fog applicator in action

applicators, with trained operators, can be hired health authorities 2

One of these machines was used this summer in t Lincolnshire village of Cranwell at the time of poliomyelitis epidemic, and Dr J Scholey, the medi officer of health, writes as follows

"Three houses in which cases had occurred were 'fogg with a solution of D D T with 0 1% of pyrethrum kerosene This was done by closing all the doors, windows except one which admitted the nozzle of machine In a matter of about five minutes the ho was filled with the 'fog,' which is delivered under press The amount of insect life destroyed is quite surpri and most illuminating a room which was comparativ free from flies and the like yielded scores of insects Out fly infested places were then chosen and were dealt by delivering a fine 'fog' of 5% D D T in kero Ponds drains and open sewers produced swarms of in life which were all quickly destroyed Here I thin word of warning should be issued, as the indiscrimin use of the machine over certain sewage plants wh depend on insect life for their effective function could definitely detrimental

There is no doubt that the Tifa fog is a most effect means of destroying flies and other insects and extrem thorough and swift in action"

The machines are extensively used for public-hea work abroad some 52 being known to be operating 46 different countries

1 Todd Insecticidal Fog Applicator Distributed by Lister T Engineering Corporation Ltd 11–13 Kingsway London W

2 From Tifa Service Chelsea Insecticides Ltd 125 Pall London S W 1

Notes and News

CHESTER REGISTRARS' MEETING

ng of the Manchester Region Registrars Group r R M FORRESTER, who was in the chair, said ıp had pressed for a proper consultant-registrar egistrars disagreed with the way the Minister as proposing to achieve this The professional ched by the Minister had regarded his proposals eable Replacement of registrars by general ıssistants could not be contemplated by hospitals, ır the general practitioners themselves Dr entioned the unsatisfactory alternative employ) the 1100 displaced registrars The most senior ıe first to be dismissed, and neither the Armed the Colonial Medical Service were attractive, as rars had already served in the Forces and many nily responsibilities Entry into general practice ely difficult for registrars The Minister had in drawing up his scheme he had not been y the Treasury and no saving would be effected ıng registrars from the hospital service to any cal service Dr Forrester put forward three hich might help to solve the registrar s problem e expansion of consultant services, (2) improve nditions in general practice and (3) extension e of senior registrar appointments, whose length with the openings in the consultant service As finite maximum tenure was laid down there would ıng of new entrants

REDMAN pointed out that such an extension would period of insecurity before the registrar knew was to get a consultant post He suggested, as ıve, the creation of junior consultant posts This as criticised by some members on the ground ervices of a fully trained consultant would be less than a consultant s pay Members agreed, y 60 votes to 22 that the present emergency can far as is possible by extending the consultant ıd by the creation, if necessary of junior con ointments A 'junior consultant' was defined to be paid at a salary intermediate between senior ıd consultant, and with full clinical responsibility, have the right to promotion to full consultant embers unanimously adopted the chairman's of policy as the basis for future discussion and ıd they rejected by an overwhelming majority a hat the principle of increased tenure of senior ppointments does not commend itself as generally

TWO PATIENTS SAW POLIOMYELITIS

th comparing two books [1] written about themselves ırs from poliomyelitis Gerald Webster gives a ward account of the life of a disabled person as longer be lived we may hope in a Welfare State had a hard time in Australia and England as a uld and young man but even so the security was emotional rather than financial It is a pity as not the capacity to describe his own feelings y as he does those of others Very occasionally shines out from its context and momentarily lights ene but for the most part the reader must use his gination to understand what the author does not ıtz Plagemann evidently has far more experience t of writing and can—almost too readily—give us hts and emotions He developed the disease as an d not as did Mr. Webster in childhood Yet for him litis was almost incidental half the book is an of his life as a pharmacist in the American Navy ıe last war and he thinks that there may well be a n between his response to that experience and the the disease Undoubtedly he seized it as a welcome om responsibility and this is the crux of the book. age poliomyelitis patient of his age is optimistic and trying hard to get better but this young man the famous Warm Springs settlement only as a ıere one becomes acclimatised to disability In the emotional conflict between his paralysis and its value as a refuge he has no energy left for recovery

In both men, however, the dominant factor is the imperative need for security not a financial or even a social security, but a true emotional security on which to base the new life They convince us that the adult injured by poliomyelitis must first of all believe in the possibility of considerable recovery and work wholeheartedly for it, but that he must at the same time be willing to accept some makeshift and perhaps permanent compensatory movements Then, in spite of even widespread paralysis, he may still live constructively Even when Gerald Webster had won a degree of financial security, his future was by no means certain until he had learnt that a cripple can still be accepted as a man both by the world about him and by himself The two books remind us that for those treating infantile paralysis the most important aspect of the patient is his mind, and its influence on recovery and reablement

[1] ked at Dawn By GERALD WEBSTER London Allan ıate 1949 Pp 205 9s 6d My Place to Stand By BENTZ EMANN London Gollancz 1950 Pp 241 10s 6d

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University of London

The title of professor of clinical pathology in the university has been conferred on Dr Montague Maizels, reader in clinical pathology at University College Hospital Medical School.

University of Bristol

At recent examinations the following were successful

Final Examination for M.B Ch.B—R M Barnes Marianne A Barry Monica B Bishop K A Boulton Luba Epsztejn B R W Evans Hella R Fluss, R F Harvey, M E Hincks K R Kidd G A Pilkington J F Rowland, Rachel D R Saslenl Mildred M C Shaw D T I Stuttaford Ginette M. Tebbutt P A. Titterton Patricia Vowles and Harold Maxwell (in Group I completing the examination)

D.P M (Part II)—J A Ardis K. W Aron, E C Turton.

University of Durham

On Dec 15 the following degrees and diploma were conferred

M B B S—Meryl A Christian J A. Eykelenboom J R J Glavina C St. J E Harding Marjorie Hepple, D D Hobbs Shirley McTaggart Brian Metcalfe Shirley M. C Nuttall Lola V Stafford Anne W Watts

D P.H—J F McGarity

University of Manchester

At recent examinations the following were successful

Final M B Ch.B—H G Arnall R. B Haigh J M. Midgley R. E Raworth Gertrude H G Robinson (old regulations) Derek Ashworth Margaret Bentley Constance M. Bevan J C Canney E H Cooper Donald Davies, Brian Didsbury, Jacob Ellis, G R Gates Ronald Hincheliffe J T W Howe Geoffrey Howitt T R Hunter Arnold Hyman J E Kench J H Latchford M. B Raby Carolyn C Rigby, Kathleen M Rushton Janet Savatard Harold Selcon Lorna J Shankland Alan Sippert Geoffrey Sullivan D W Sumner S E Sutton Olive M. Thomas C F H Vickers Margaret R Walley Brian Ward G R Whittaker David Wolman (new regulations)

D.P M—Zygmunt Finkelstein L G Nicol Margaret I Platt Susanne Shafar T P Smith

University of Edinburgh

On Dec 15 the following degrees and diploma were conferred

M D—E D Caldwell, T M. Chalmers E. N Moyes †C Scott Russell *J T R. Russell †J. J Stevenson

* Commended † In absentia

M.B Ch.B—H F Acheson W D A Birch G Y Cheyne Phyllis Connor B S Dorfman I A. Fraser A D Gentle John Grant E R Henry Brenda M Johnson Hazel M. Lazarus Margaret E Loudon, Alastair Macaulay, A R Manners, W P Mazur J A Mitchell, P T Monard Robert Renton P F E Rushforth T M. N Salvesen, L E S Sandison G A. Steele J F Stephen E B Tagoe Nancy M. Tweedie Stodart, Mary B Watson, J S Whittaker T W Wilkinson

D M.R T—J D Abbatt

University of Sheffield

Dr D E Price has been appointed honorary lecturer in pathology

Royal Faculty of Physicians and Surgeons of Glasgow

Sir John Parkinson will deliver the Finlayson lecture to the faculty at 242, St Vincent Street, Glasgow on Wednesday Jan. 10, at 5 P M He is to speak on Symptoms in Cardiac Diagnosis

Institute of Neurology

A film will be shown at the National Hospital, Queen Square London W C 1, on Friday Jan 5, at 5 P M., of an hemispherectomy performed by Mr R A. Krynauw F R.C.S.E, head of the department of neurosurgery Johannesburg Hospital.

Caribbean Conference

The British Medical Association is holding, at Port of Spain, Trinidad, from Jan 8 to 13, a conference at which Dr Guy Dain will take the chair Dr Dain will be accompanied on his visit to the West Indies by Dr H B Morgan, who will also speak at the conference

Course on Rheumatic Diseases

A course on the chronic rheumatic diseases is being held at the rheumatism unit of St Stephen's Hospital, Fulham Road, London, S W 10, on Saturday and Sunday, March 3 and 4 Dr Russell Brain, F R C.P , will give the inaugural lecture Further details can be had from the medical registrar of the unit

Cytology of Bacteria

A joint meeting of the microbiological panel of the society of Chemical Industry and of the Society for Applied Bacteriology on this subject will be held on Wednesday, Jan 10, at 2 15 P.M , at 11, Chandos Street, London, W 1 Prof R J V Pulvertaft, F R C P , will open the discussion

W H O and Alcoholism

A committee of the World Health Organisation's expert panel on mental health met in Geneva this month to discuss alcoholism as a public health problem According to the *New York Times* (Dec 17) the committee has recommended that special clinics be set up in general hospitals throughout the world It also urged the establishment of a world clearing centre for scientific information on the causes and cures of alcoholism

College of Food Technology

After negotiations between the Ministry of Education the Ministry of Food, and representatives of sections of the food industry, it has been decided to set up a National College of Food Technology in London about next September Students will be drawn from the food industry at the age of 23 or over, to receive advanced training The board of governors has been appointed by the Ministry of Education and will include Mr Frank Shires, of the Food Manufacturers Federation, as chairman, and Mr John Hammond, F R S , reader in agricultural physiology in the University of Cambridge, as vice chairman

Sale of Peckham Health Centre

Subject to the approval of the Ministries of Health and Education, London County Council is shortly to acquire this centre, for the sum of £60,000 The L C C education services are at once to have the use of the swimming bath, gymnasium, and lecture hall Within the next two years an antenatal centre is to be set up in the medical rooms of the centre, and the ground floor is to be adapted for use as a day nursery Later it is planned to establish a general practitioner health centre, maternity and child welfare centre, and dental centre to serve 26,500 people, and a medical research unit This full scheme will cost nearly £126,000 The new facilities will to some extent continue the work of the old Peckham Health Centre, but as it will not be in the original form it has been agreed that the building shall not bear the name of the Pioneer Health Centre or the Peckham Health Centre

Payment of Advisory Appointments Committees

The Ministry of Health has announced in a circular (R H.B [50] 124) new arrangements for the payment of advisory appointments committees constituted after receipt of the circular The Minister, this says is of opinion that ' it is not appropriate that members of these Committees should receive fees (bearing in mind that members of Boards themselves and their normal committees are not entitled to be paid fees) ' Nevertheless these members should be able to claim compensation for any loss of earnings and for additional expenses, subject to the conditions applied to members of boards and their committees generally The one exception is a consultant appointed from outside the region to serve on an advisory appointments committee in the case of a post at a non teaching hospital, or on a joint advisory appointments committee set up where it is proposed to appoint the same person in both a teaching and a non teaching hospital This member may be remunerated at the rate of 7 guineas a day or 4 guineas a half-day provided that he is not drawing the full [illegible] whole time employment

Yorkshire Society of Anæsthetists

A meeting of this society will be held at 8 P.M on Jan 3, at Leeds General Infirmary, when Dr [illegible] speak on Anæsthesia for Babies and Children.

International Exhibition of Medical Arts

This exhibition and a series of international surgical meetings will be held at Turin from June 21 under the auspices of *Minerva Medica* Italian Medical Association Further information had from Prof S Teneff, Palazzo delle Esposizioni al Torino, Italy

Sir Gordon Gordon Taylor has left London on a fo[illegible] visit to Pakistan arranged by the British Council

Copies of the proceedings of the third conference on [illegible] works safety, held at Scarborough from Sept 29 to [illegible] may now be obtained from the Association of British [illegible] Manufacturers, 166, Piccadilly, London, W 1 (5s post[illegible])

Appointments

GOODDY W W M.D Lond , M R C P asst physician, [illegible] Hospital Queen Square, London
GORDON E G L.R C.P.E asst pathologist Dudley and [illegible] bridge group of hospitals
McDOUGALL J H M B Glasg D.P M deputy medical [illegible] intendent, Rampton Hospital
VICKERY K O A M D Lond D.P H deputy M.O H and [illegible] school M O , Bournemouth

Appointed Factory Doctors :

DUNLOP, ROBERT M B Belf St Columb district Co[illegible]
RUSACK L S M B Aberd Haddington district, East [illegible]
WOOLLEY A W M B E M B Brist Wells district, S[illegible]

Colonial Service

ANDRE J A H M B E M R C.S deputy director of [illegible] services, Mauritius
BAILEY C E S M B Edin D T.M & H D P.H. asst. [illegible] of medical services, British Guiana.
CONRAN H W, M D D P.H M O Fiji
HALLMAN, G O M D M O Fiji and South Pacific [illegible] service
HOLLITSCHER, GERTRUD, M D Vienna lady M O , Federa[illegible] Malaya
HUNTER J K M B. Glasg D T M & H , D.P H asst dire[illegible] medical services Uganda
JAMES OLIVER M.B Lond. M O. (temporary), Barbados.
KALINSKY B M B M O , British Guiana
KIRWAN E J M B M.CH N U I special grade M.O., N[illegible]
LUPPRIAN, K G , M.B Lond M O Federation of Malaya
MADHOO B G L.R C P E M.O Mauritius
MITFORD BARBERTON, G DE B , B M Oxfd M O , Uganda
OAKEY, J S M.B Sydney M O Tanganyika
O'DEA J J M.B N U I M.O Northern Rhodesia
STOKER G E , M.C , M R C.S M O (temporary), General Ho[illegible] Barbados
SZELEY, A M D M.O (temporary) Falkland Islands.
WRAY J R R , M.R C.S M O , Kenya

Births, Marriages, and Deaths

BIRTHS

ALEXANDER —On Dec 16 in Kingston Jamaica, the w[illegible] Dr H D Alexander—a son
ALTMANN —On Dec 17 in London the wife of Dr G R Al[illegible] —a son
BERMAN —On Oct 16 in New York, the wife of Dr L H B[illegible] —a daughter
BRAINES —On Dec 13, in Jersey the wife of Dr Frederick [illegible] Braines—a daughter
CURWEN —On Dec 15 in Bristol the wife of Dr Sydney C[illegible] —a son
EASTCOTT —On Dec 18 in London the wife of Mr H [illegible] Eastcott F.R C.S —a daughter
FISHER —On Dec 14 in London the wife of Dr Oliver F[illegible] a son
LEE —On Dec 18, at Twickenham the wife of Dr Edwar[illegible] —a daughter
MAY —On Dec 17 at Chatham Kent, to Dr Madeleine Ma[illegible] Mackenzie) the wife of Dr G A. May—a son.
PARKER —On Dec 17 in Manchester the wife of Dr L Pa[illegible] a son
QUINLAN —On Dec 15 at Stoke-on Trent, the wife of Mr [illegible] Quinlan—a daughter
URMSTON —On Dec 16 the wife of Dr J H B Urmst[illegible] daughter

DEATHS

FORD —On Dec 18 at Hertford, Alma Percy Ford M R C[illegible]
HUGHES —On Dec 14 Muriel Hughes M B Manc D P M
NEWBY —On Dec 14 at Croydon Gervase Edward Newby [illegible] F R.C.S aged 81
PARSONS —On Dec 17 in Birmingham Sir Leonard P[illegible] M.D Lond F R C P F R C O G F R.S aged 71
SMITH —On Dec 15 Sydney Watson Smith M D Edin [illegible] F R C P L
VAUGHAN —On Dec 13 Arthur Christopher Toulmin [illegible] M R. Lpool aged 41

annual Coll